

## GPAT QUESTION PAPER 2020 WITH ANSWER KEY

1. Relative sweetness of sucrose, to saccharin :

- (a) 1: 200      (b) 1: 500      (c) 1: 100      (d) 1: 400

2. Following statement is more accurate with respect to limitations of Arrhenius relationship for stability prediction :

- (a) Order of degradation will alter at higher temperature  
(b) Equal moisture concentrations will be mentioned at different temperatures  
(c) Less relative humidity and oxygen solubility at higher temperature  
(d) Same degradation mechanisms may predominate at different temperatures

3. Lakes of Dyes available commercially contain maximum upto.....of pure dye.

- (a) 15%      (b) 10%      (c) 25%      (d) 50%

4. Type II glass containers are

- (a) Suitable for alkaline solutions  
(b) Most inert glasses and shows high hydrolytic resistance  
(c) Suitable for most acidic and neutral aqueous preparations  
(d) Suitable for non-aqueous preparations

5. Dimethyl sulfoxide acts as penetration enhancer for topical formulations by

- (a) Increasing solubility      (b) Denaturing proteins  
(c) Increasing transepidermal loss      (d) Altering solvent nature of membrane

6. As per European Pharmacopoeia technical guide, substance stored at 25°C for 24 hours at 80% RH, called very hygroscopic when increase in weight is

- (a) 0.2% w/w and <15% w/w      (b) > 0.2% w/w and < 20% w/w  
(c) > 15% w/w      (d) 0.2% w/w and < 2% w/w

7. SCHICK Test Toxin is a sterile Filtrate from a culture of

- (a) Rickettsia prowazeki      (b) Mycobacterium Diphtheriae  
(c) Coryne bacterium Diphtheriae      (d) Actinobacillus mallei

8. Violin gut is obtained from intestine of

- (a) Horse (b) Cat (c) Sheep (d) Camel

9. An excipient Ludipress used for liquid Dosage form is a coprocessed excipient of

- (a) PticInsi. Dextrose monohydrate + Kollidon 30  
(b) Lactose monohydrate + Kollidon 30  
(c) Lactose monohydrate + Kollidon 30 + Kollidon CL  
(d) Dextrose monohydrate + Kollidon 30 + Kollidon CL

10. Pyrogens present in containers can be destroyed by heating the containers at

- (a) 121°C for 15 mins  
(b) 121°C for 30 mins

- (c) 210°C for 4 h
- (d) 210°C for 1 h

11. In capsule making the Bloom strength of gelatin is proportional to molecular weight of the gelatin and is a measure of the;

- (a) Cohesive strength of the solvent molecules
- (b) Cohesive strength of the crosslinking that occurs between gelatin molecules
- (c) Adhesive strength of gelatin with dipping pins
- (d) Adhesive strength of gelatin with other polymer

12. Choose the wrong statement from the following with regard to Amorphous solids

- (a) Usually they are anisotropic
- (b) They tend to flow when subjected to sufficient pressure
- (c) Considered as super cooled fluids
- (d) They do not have definite melting point

13. The 'Crenulation' effect on the cell wall is caused by \_\_\_\_\_ solutions and this effect is \_\_\_\_\_.

- (a) Hypertonic; reversible
- (b) Hypotonic; reversible
- (c) Hypotonic; irreversible
- (d) Hypertonic; irreversible

14. The unequal attractive forces acting on the molecules at the surface of liquid gas interface when compared with molecular forces in the bulk of the liquid is due to:

- (a) Absence of adhesive force of attraction
- (b) Less adhesive force of attraction
- (c) Absence of cohesive force of attraction
- (d) Less cohesive force of attraction

15. Following is the important sterol in faeces formed from cholesterol by bacteria in lower intestine:

- (a) 7- $\alpha$ -Hydroxy cholesterol
- (b) Coprostanol
- (c) 7-Dehydrocholesterol
- (d) Lithocholic acid

16. According to distribution law, select the appropriate expression for the concentration of a solute when it exist as monomer in solvent A and dimer in solvent B (Assume  $C_A$  = concentration of solute in solvent A  $C_B$  = concentration of solute in solvent B  $\alpha$  = degree of dissociation)

(a)  $K = \frac{C_A}{2 \times \sqrt{C_B}}$       (b)  $K = \frac{C_A}{C_B \times (1 - \alpha)}$       (c)  $K = \frac{C_A}{C_B \times (2 - \alpha)}$       (d)  $K = \frac{C_A}{\sqrt{C_B}}$

17. The drug concentration between Minimum effective concentration (MEC) and maximum safe concentration (MSC) is called

- (a) Toxic range      (b) Therapeutic index      (c) Therapeutic ratio      (d) Therapeutic range

18. Production of Acetyl methyl carbinol can be detected by which of the following test

- (a) Voges-proskaver test      (b) Indole test      (c) Citrate utilization test      (d) Methyl red test

19. The temperature dependence and the theory of viscosity is expressed by the following

- (a) Stern-Volmer equation      (b) Arrhenius equation of chemical kinetics  
(c) Higuchi equation      (d) Gibb's equation

20. Which of the following is not a fundamental (primary) factor considered for selection of a location for the construction of pharmaceutical or chemical plant

- (a) Soil      (b) Market for products      (c) Labor supply      (d) Raw materials

21. The following gram positive bacteria species is positive for the coagulase test (a test for the ability of bacteria to cause blood plasma to clot)

- (a) S. epidermidis      (b) S. aureus      (c) S. Saprophyticus      (d) S. lactis

22. The version of GMP in India that describe requirement of factory premises for manufacture of cosmetics

- (a) schedule-M      (b) Schedule-M-III      (c) Schedule-M-II      (d) Schedule M-I

23. This fungus is also known as opportunistic pathogen, often isolated from warm-blooded animals.

- (a) Aspergillus niger      (b) Penicillium notatum      (c) Penicillium chrysogenum      (d) Candida albicans

24. Which of the following will result in very closest value to the Glomerular Filtration Rate (GFR) ?

- (a) Insulin Clearance      (b) Albumin Clearance  
(c) Measure of Blood Urea Nitrogen (BUN)      (d) Creatinine Clearance

25. While studying solid state physicochemical properties, the packing property of drug include

- (a) Heat capacity      (b) Solubility      (c) Refractive index      (d) Entropy

26. The Acidic polymers of Ribitol/Glycerol phosphate present in Gram positive microorganism are known as

- (a) Polysaccharides      (b) Teichoic acids      (c) Peptidoglycans      (d) Lysozymes

27. Increasing the proportion of the disperse phase of an emulsion by more than 60% may lead to

- (a) Cracking      (b) Frothing      (c) Phase inversion      (d) Creaming

28. The second law of thermodynamics states that 'whenever a spontaneous process takes place, it is accompanied by an increase in the total energy of the universe! The equation that satisfies the above law is :

- (a)  $\Delta S_{\text{universe}} = S_{\text{system}} + \Delta S_{\text{surrounding}}$   
(b)  $S_{\text{system}} = \Delta S_{\text{universe}} + \Delta S_{\text{surrounding}}$   
(c)  $\Delta S_{\text{universe}} = \Delta S_{\text{surrounding}} - S_{\text{system}}$   
(d)  $\Delta S_{\text{universe}} = S_{\text{system}} - \Delta S_{\text{surrounding}}$

29. The complexation of Quinine with hexyl salicylate is an example of absorption by

- (a) Convective transport      (b) Facilitated transport      (c) Penocytosis      (d) Ion pair transport

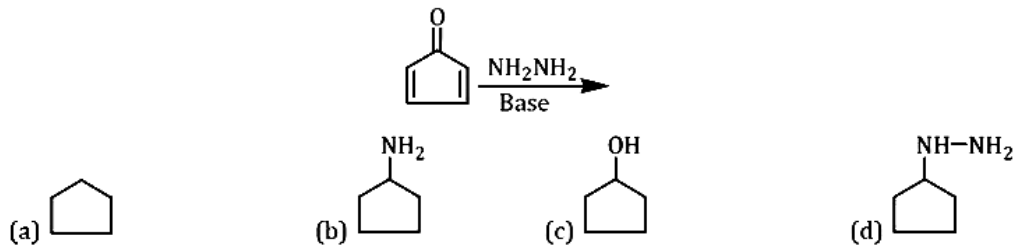
30. The polymorphs exhibit the following different properties Except :

- (a) X-ray crystal and diffraction patterns      (b) Melting points  
(c) Solubilities      (d) Chemical structures

31. Method of Study Drug Distribution pattern is :

- (a) Mass spectrophotometry      (b) Nuclear magnetic resonance  
(c) Flourimetry      (d) UV-visible spectrophotometry

32. Product of the following



reaction:

33. Which of the following powder shows the greatest degree of dustibility

- (a) Talcum powder (b) Lycopodium powder (c) Fine charcoal (d) Potato Starch

34. The dispersion of coarse material by shearing in a narrow gap between a static cone and a rapidly rotating cone is caused by

- (a) Colloid Milk (b) Electrical Dispersion (c) Peptisation (d) Ultrasonic Irradiation

35. When the concentration of an aqueous sodium chloride solution has the same colligative properties as the solution in question, the value so obtained is known as

- (a) Normality (b) Isotonicity value (c) Molarity (d) Molality

36. When adhesive attractions between molecules of different species exceeds cohesive attraction between like molecules, the deviation according to Raoult's law is said to be

- (a) Partial (b) Positive (c) Neutral (d) Negative

37. Centistoke is the CGS unit for the following property

- (a) Surface tension (b) Coefficient of viscosity (c) Fluidity (d) Kinematic viscosity

38. Molar heat capacity of a system is defined as :

- (a) The amount of heat required to raise temperature of one mole of the system by one Kelvin  
(b) The amount of heat required to decrease temperature of one mole of the system by one Kelvin  
(c) The amount of heat required to decrease temperature of one mole of the system by one Fahrenheit  
(d) The amount of heat required to raise temperature of one mole of the system by one Fahrenheit

39. When a solid forms a gel more readily when gently shaken or otherwise sheared than when allowed to form the gel while the material is kept at rest, the phenomenon is known as

- (a) Thixotropy (b) Rheopexy (c) Negative rheopexy (d) Anti thixotropy

40. In the process of Extraction, ethanol is used as a solvent for

- (a) Sucrose (b) Waxes (c) Alkaloids (d) GUMS

41. Human Serum Albumin has a molecular weight of

- (a) 34,000 (b) 65,000 (c) 44,000 (d) 59,000

42. Riboflavin, chemically is

- (a) 6,7-dimethyl isoalloxazine (b) 6,7-diethyl isoalloxazine  
(c) 8,9-dimethyl isoalloxazine (d) 8,9-diethyl isoalloxazine

43. Burow's solution is

- (a) Aluminium acetate solution strong (b) Calcium phosphate solution strong



- (c) Ammonium acetate solution strong (d) Calcium hydroxide solution

44. Drug products that contain the same therapeutic moiety but as different salts, esters or complexes are called as

- (a) Therapeutic equivalents (b) Pharmaceutical equivalents  
(c) Pharmaceutical alternative (d) Therapeutic alternatives

45. When six suppositories containing 20 percent of morphine hydrochloride in Theobroma oil are to be prepared, which of the following statement is correct ? (Given : Displacement value of morphine hydrochloride is 1.5; weight of each suppository is 1 g)

- (a) The displacement value of morphine hydrochloride is to be considered  
(b) The displacement values of both morphine hydrochloride and Theobroma oil are to be considered  
(c) The displacement value of morphine hydrochloride is to be ignored  
(d) The displacement value of Theobroma oil is to be considered

46. Following amino acid does not exhibit optical isomerism:

- (a) Serine (b) Alanine (c) Glycine (d) Leucine

47. Fraction of administered dose (which may be -n form of an ester or salt) of active drug is termed as

- (a) Activity factor (b) Formulation factor (c) Intrinsic factor (d) Salt factor

48. If two monosaccharides differ in their structure around a single carbon atom, they are called as

- (a) Epimers (b) Dimers (c) Trioses (d) Trimers

49. Which of the following is the example of "Invert Sugar"

- (a) Sucralose (b) Lactulose (c) Lactose (d) Sucrose

50. Which of the following groups stabilizes carbocation in electrophilic aromatic substitution

- (a) -CN, -SO<sub>3</sub>H (b) -COOH, -CHO (c) -NH<sub>2</sub>, -OH (d) —N(CH<sub>3</sub>)<sub>3</sub><sup>+</sup>, —NO<sub>2</sub>

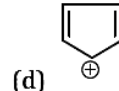
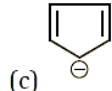
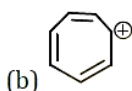
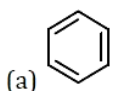
51. The mechanism of antiepileptic effect of Lamotrigine is by :

- (a) Inhibition of glutamate release (b) Blockade of NMDA receptors  
(c) Inhibition of Na<sup>+</sup> channels (d) Inhibition of Ca<sup>++</sup> channels

52. Closeness of a measured value to the true or accepted value is known as

- (a) Accuracy (b) Deviation (c) Precision (d) Bias

53. Which of the following is Anti aromatic



54. Globar source in infra-red spectrophotometer is

- (a) Silicon carbide rod (b) Rhodium wire heated in ceramic  
(c) Tungsten filament (d) Nichrome wire

55. Cotrimoxazole is combination of trimethoprim with sulfamethoxazole. Which of the following statement is correct about Cotrimoxazole?

- (a) Cotrimoxazole is contraindicated during pregnancy.
- (b) Most effective ratio of trimethoprim: sulfamethoxazole in plasma is 20:1.
- (c) Trimethoprim : sulfamethoxazole are administered in a dose ratio of 5 :1 to achieve optimal synergistic effect.
- (d) Cotrimoxazole is ineffective in treating respiratory tract infections.

56. Ion trapping is an important process in drug distribution with potential therapeutic benefit. It is defined as <http://www.xamstudy.com>

- (a) An acidic drug will accumulate on the more basic side of the membrane and a basic drug on more basic side.
- (b) An acidic drug will accumulate on the more acidic side of the membrane and a basic drug on more basic side.
- (c) An acidic drug will accumulate on the more basic side of the membrane and a basic drug on more acidic side.
- (d) An acidic drug will accumulate on the more acidic side of the membrane and a basic drug on more acidic side.

57. Identify the diuretic which causes hyperuricemia, tend to raise serum calcium and also causes magnesium depletion

- (a) Acetazolamide      (b) Furosemide      (c) Mannitol      (d) Chlorthiazide

58. The Nitration of quinoline gives a mixture of

- (a) 3-nitro-and 6-nitroquinolines      (b) 2-nitro-and 7-nitroquinolines
- (c) 5-nitro-and 8-nitroquinolines      (d) 2-nitro-and 4-nitroquinolines

59. The specific reagents used in skrap synthesis of quinoline are

- (a) Benzaldehyde, aniline, sulfuric acid and Nitrobenzene
- (b) Glycerol, aniline, sulfuric acid and Nitrobenzene
- (c) Aminoethanal and Nitrobenzene
- (d) Glycerol, Acetal of aminoethanal and Nitrobenzene

60. Mitomycin C is an antibiotic isolated from

- (a) Streptomyces peucetius      (b) Streptomyces verticillus
- (c) Streptomyces antibioticus      (d) Streptomyces caespitosus

61. This 4-amino quinoline antimalarial drug marketed as R, S isomer, has two trifluoromethyl moieties at position 2' and 8' and no electronegative substituent either at 6' or 7' positions is

- (a) Mefloquine      (b) Chloroquine      (c) Primaquine      (d) Amodiaquine

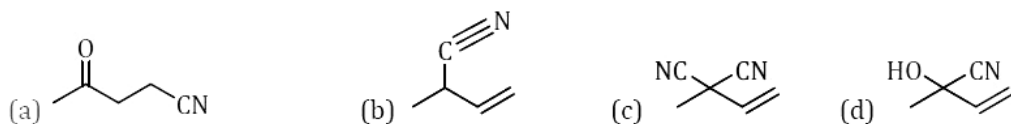
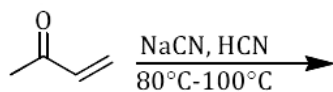
62. Which one is NOT an opioid receptor

- (a) Gamma      (b) Kappa      (c) Mu      (d) Delta

63. One of the following statement with respect to carbachol is NOT correct Identify:

- (a) It can be administered orally
- (b) It possess both muscarinic and nicotinic action
- (c) It is more susceptible to hydrolysis as compared to acetylcholine
- (d) The amino group decreases electrophilicity of the carbonyl group

64. What is the product of the following reaction?



65. Which three of the following are physiological effects of ganglionic stimulating agents

- (A) Stimulation of sympathetic ganglia and the adrenal medulla leading to cardiovascular responses
- (B) Initial transient stimulation and then a more persistent depression of all autonomic ganglia
- (C) Marked depression of CNS leading to analgesia.
- (D) Chronic exposure causes a marked increase in the density of nicotinic receptors contributing tolerance and dependence.
- (E) Combined activation of parasympathetic ganglia and cholinergic nerve ending by nicotine results in increased tone and motor activity of the bowel.
- (F) Inhibition of salivary and bronchial secretions that is followed by stimulation.

- (a) (A), (C) and (D)
- (b) (B), (D) and (F)
- (c) (B), (C) and (E)
- (d) (A); (B) and (D)

66. Two pore domain K<sup>+</sup> ions channels are opened by which one of the following categories of anaesthetic

- (a) Barbiturates
- (b) Benzodiazepines
- (c) Opioid analgesics
- (d) Halogenated inhalation anaesthetic

67. Which of the following rearrangement involves migration of a group from carbon to electron deficient nitrogen

- (a) Wilgerodt rearrangement
- (b) Baeyer villiger, rearrangement
- (c) Pinacol-pinacolone rearrangement
- (d) Beckmann rearrangement

68. The mechanism by which fluorides inhibit dental caries is

- (a) By increasing susceptibility to acid
- (b) By increasing the sensitivity of tooth enamel
- (c) Decreased acid solubility of enamel
- (d) Increased acid solubility of enamel

69. The solvent used in NMR spectroscopy with the highest level of deuteration among these is :

- (a) Deuterioacetone
- (b) Deuterium oxide
- (c) Deuteriomethanol
- (d) Deuteriochloroform

70. The weakly acidic nature of warfarin is attributed to the presence of  
(a) Methylene protons on substitution at 3rd position  
(b) Proton of hydroxyl group at 4th position  
(c) Proton on chiral carbon  
(d) Aromatic protons of coumarin ring
71. Which of the following drugs possesses Antiplatelet effects  
(a) Erythropoietin (b) Urokinase (c) Desmopressin (d) Clopidogrel
72. Walden inversion or complete reversal of stereochemistry occurs in one of the following substitution reaction  
(a) S<sub>N</sub>Ar reactions (b) S<sub>N</sub>i reaction (c) S<sub>N</sub>2 reactions (d) S<sub>N</sub>1 reactions
73. Antifungal agent 5-fluorocytosine is converted to its active metabolite 5-fluorouracil by one of the following fungal enzyme  
(a) Cytosine deacetylase (b) Cytosine reductase  
(c) Cytosine demethylase (d) Cytosine deaminase
74. Propanone and 2-hydroxy propene are  
(a) Position isomers (b) Rotamers (c) Chain Isomers (d) Tautomers
75. The principle of liquid-liquid extraction is  
(a) Partition (b) Solubility (c) Adsorption (d) Separation
76. When an electron with charge  $1.60 \times 10^{-19}$  coulombs is moved through a potential difference of 1 volt, the energy expended or released is called as
77. An aldopentose can be converted into aldohexose by :  
(a) Ruffs degradation method (b) Wohls method  
(c) Killani-Fischer synthesis (d) Hoffmann degradation method
78. Hydrated proton is called  
(a) Water proton (b) Hydronium ion (c) Roxonium ion (d) Proton pump
79. What is the approximate chemical shift ranges for protons attached to aldehydic groups?  
(a) 4-8  $\delta$  (b) 9.5 - 10.0  $\delta$  (c) 6 - 7.9  $\delta$  (d) 1.5 - 3.5  $\delta$
80. The condensation of an active methylene compound with formaldehyde and an amine to form  $\beta$ -amino carbonyl compound is known as  
(a) Mannich reaction  
(b) Knoevenagel condensation  
(c) Stobbe condensation  
(d) Beckmann rearrangement

81. Meloxicam belongs to which class of Non-steroidal Anti-inflammatory Drugs (NSAIDs) (a) Preferential cox-2 inhibitor  
(b) Selective Cox-1 inhibitor  
(c) Preferential Cox-1 inhibitor  
(d) Selective Cox-2 inhibitor

82. Which one of the following is not the property of osmotic diuretics  
(a) Undergo limited reabsorption by the renal tubule  
(b) Are relatively inert pharmacologically  
(c) They inhibit carbonic anhydrase  
(d) Freely filtered at the glomerulus

83. Electron releasing groups stabilizes free radicals by  
(a) Positive inductive ( + I) effect                      (b) Negative mesomeric ( — m) effect  
(c) Positive mesomeric ( +m) effect                      (d) Negative inductive ( -I) effect

84. The principle of gas-liquid chromatography is  
(a) Partition chromatography                      (b) Affinity chromatography  
(c) Adsorption chromatography                      (d) Ion exchange chromatography

85. The heterocyclic nucleus present in nitrofurantoin are  
(a) 3-nitro furan and imidazole 2, 4-dione  
(b) 2-nitro furan and imidazoline-2-one  
(c) Furan and pyrrole  
(d) 2-nitro furan and imidazole 2, 4-dione

86. d-tubocurarine produces skeletal muscle relaxation by inhibiting  
(a) Ganglionic nicotinic receptors  
(b) Muscarinic receptors  
(c) Nicotinic receptors in neuromuscular junction  
(d) alpha-adrenergic receptors

87. Which of the following is not one of the triade effects of adrenaline leading to rise in blood pressure  
(a) A direct myocardial stimulation that increases the strength of ventricular contraction  
(b) An increased heart rate (positive chronotropic action)  
(c) Vasoconstriction in many vascular bed specially in precapillary resistance vessels of skin  
(d) Stimulation of presynaptic alpha-2 adrenoreceptor leading to increase sympathetic tone  
Section : Pharmacognosy

88. " Which one of the following is not the biochemical marker of all death?  
(a) Phospholipase (b) Creatine kinase (c) Lipase (d) Amylase

89. In the transplant rejection the clinical features of graft-versus-host reaction includes following-Except  
(a) Dermatitis, diarrhoea

- (b) Fever, weight loss
- (c) Intestinal malabsorption
- (d) Rheumatoid arthritis

90. Which one of the following statement is true for cancer cells

- (a) Oncoproteins produced by cancer cells act a neighboring cells
- (b) Cancer cells require stimulation by growth factors (c) Cancer cells are highly sensitive to growth inhibitory signals
- (d) Cancer cells produce Oncoproteins in the absence of growth factors or external stimuli

91. Rosacea is a skin condition that affect :

- (a) Teenage people
- (b) Old age people
- (c) Only woman
- (d) Adults between the age of 30 - 60

92. A typical long bone consists of following parts except

- (a) The diaphysis (b) The trabeculae (c) The epiphyses (d) The periosteum

93. Which of the following Neurotransmitter is formed on demand and act immediately

- (a) Acetylcholine (b) Histamine (c) Nitric oxide (NO) (d) Adrenaline

94. In one of the following situations metabolic acidosis does not occur

- (a) Uncontrolled diabetes mellitus
- (b) Therapeutic administration of acetazolamide
- (c) Chronic renal failure
- (d) Production of less amount of lactic acid

95. Which one of the following is a organ specific (localized) autoimmune disease

- (a) Grave's disease (b) Scleroderma (c) Polyarteritis nodosa (d) Rheumatoid arthritis

96. One of the following is not a chemical or histochemical change that occurs in infarction of heart

- (a) Decrease in sodium
- (b) Glycogen depletion
- (c) Influx of calcium
- (d) Increase in lactic acid

97. Following pairs represent antibiotic and its source. Identify the correct pair

- (a) Griseofulvin: Bacteria
- (b) Polyenes: Fungi
- (c) Colistin: Fungi
- (d) Macrolides: Actinomycetes Section : Pharmacology

98. Who was the Chairman of the Drugs Enquiry Committee which was established in the year 1927?

(a) B. Mukherjee (b) Joseph Bhore (c) S.S. Bhatia (d) R.N. Chopra

99. Which one of the following is not a renal osteodystrophy (type of bone disease associated with chronic kidney disease) ?

- (a) Adynamic bone disease
- (b) Osteomalacia
- (c) Secondary hypoparathyroidism
- (d) Mixed renal osteodystrophy

100. Plants which are not differentiated into root, stem and leaves are :

- (a) Plant aginales (b) Principes (c) Thallophyte (d) Bromeliales

101. Identify antiarrhythmic drug that increases duration of QT wave and decreases the sinus rate, whereas it has no effect on QRS complex

- (a) Lidocaine (b) Amiodarone (c) Verapamil (d) Quinidine

102. As per the Drugs and Cosmetics Act-1940, if a drug is not labelled in prescribed manner it is a

- (a) Spurious drug (b) Substandard drug (c) Adulterated drug (d) Misbranded drug

103. " The major property of Ayurvedic herbs, "Rasa" indicates

- (a) Taste (b) Post digestive effect (c) Potency (d) Physicochemical properties

104. Except one of the following pairs represent drugs used in the treatment of glaucoma and their primary mechanism. Select the wrong pair from the following

- (a) Topical prostaglandin analogues: Increase aqueous outflow
- (b) Topical beta-adrenergic blockers: Decrease aqueous outflow
- (c) Topical miotics: Increase aqueous outflow
- (d) Topical carbonic anhydrase inhibitors: Decrease aqueous formation

105. Auto rhythmicity is present in which of the following group of tissues ?

- (a) Skeletal muscle and cardiac muscle
- (b) Skeletal muscle and visceral smooth muscle
- (c) Cardiac muscle and neuronal tissue
- (d) Cardiac muscle and visceral smooth muscle

106. During the denaturation cycle in polymerase chain reaction the temperature is raised to:

- (a) 90 -98°C (b) 60 - 68°C (c) 70 - 78°C (d) 80 - 88°C

107. The general purpose sodalime glass is not a suitable material for fabricating the container for

- (a) Parenteral (b) Oral solutions (c) Liquids for external use (d) Dry powders

108. In which year India signed General Agreement on Trade and Tariffs (GATT) including Trade Related Intellectual Property Rights (TRIPS)

- (a) 1996 (b) 1994 (c) 1992 (d) 1990

109. A fixed oil when added to an equal volume of ethanol; clear liquid is obtained; on cooling at 0°C and on storage for three hours, the liquid remains clear such fixed oil is identified as :

- (a) Castor Oil (b) Soyabean oil (c) Neem oil (d) Evening Primrose oil

110. In shikimic acid pathway, chorismate mutase converts chorismic acid to

- (a) Carotenoids (b) Phytol (c) Prephenate (Prephenic acid) (d) Gutta

111. Standards to be complied under D & C act -1940 for drugs imported, manufactured, stocked and exhibited for sale or distribution are covered under

- (a) Schedule M (b) Second Schedule (c) First Schedule (d) Schedule L

112. In colour test for alkaloids colchicine with mineral acids gives

- (a) Blue colour (b) Red colour (c) Yellow colour (d) Violet colour

113. Nicotine from tobacco is an alkaloid which is

- (a) Oxygen free liquid (b) Semisolid (c) Crystalline (d) Oxygen free solid

114. In solid-solid mixing, large scale continuous type of mixer is

- (a) Sigma blender
- (b) Ribbon blender
- (c) Zigzag blender
- (d) Twin shell blender

115. Which one of the following is not affected in respiratory tuberculosis

- (a) Pleural cavity (b) Mediastinal lymph nodes (c) Pericardium (d) Larynx

116. Identify phase of clinical trial having following features

- (A) Trial is conducted on about 3000 patients
  - (B) Purpose of trial is therapeutic confirmation
  - (C) Safety and tolerability is evaluated on wider scale
  - (D) Completion of trial is followed by New Drug Application (NDA) Options –
- (a) Phase - III (b) Phase - I (c) Phase - IV (d) Phase - II

117. Which of the following Microorganism is used for the effective synthesis of interferon

- (a) Micrococcus Luteus
- (b) Bacillus Subtilis
- (c) Saccharomyces Cerevisiae
- (d) Pseudomonas Aureginosa

118. In yam, the presence of, irregular arrangement of the fibres, the ends of which often project from the surface is because of

- (a) Absence of linters
- (b) Absence of combing
- (c) Presence of impurities



(d) Improper drying

119. In International organization for standardization (ISO), standard pertaining to quality system model for quality assurance in production, installation and servicing is given under

(a) ISO 9002 (b) ISO 9000 (c) ISO 9001 (d) ISO 9004

120. In Aloe the mucilage containing parenchymatous cells are present in

(a) Central parenchymatous region

(b) Pericyclic cells

(c) Epidermis

(d) Vascular bundles

121. Mechanical digestion in mouth in which food is mixed with saliva is and the movement of food from mouth into the stomach is

(a) Mastication; deglutition

(b) Deglutition; propulsion

(c) Segmentation; mastication

(d) Segmentation; propulsion

122. The Crystal form of Sulphacetamide is :

(a) Rhombohedral (b) Orthorhombic (c) Monoclinic (d) Triclinic

123. As per the definition of D and C Act, Gudakhu (rubbed against human teeth) is considered as : (a) Food (b) Drug (c) Sweeting gum (d) Cosmetic

124. The fundamental principle "Law of similia" falls under which therapy

(a) Ayurveda (b) Siddha

(c) Homoeopathy

(d) Aroma therapy

125. Dragendorff's reagent is

(a) Potassium iodate

(b) Potassium bismuth iodide

(c) Potassium mercuric iodide

(d) Potassium picrate

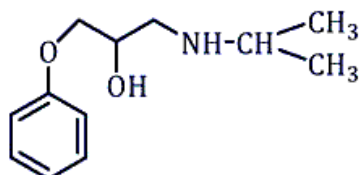
1 - b	16 - d	31 - a	46 - c	61 - a	76 - d	91 - d	106 - a	121 - a
2 - c	17 - d	32 - a	47 - d	62 - a	77 - c	92 - b	107 - a	122 - b
3 - d	18 - a	33 - b	48 - a	63 - c	78 - b	93 - c	108 - b	123 - d
4 - c	19 - b	34 - a	49 - d	64 - a	79 - b	94 - d	109 - a	124 - c
5 - b	20 - a	35 - b	50 - c	65 - d	80 - a	95 - a	110 - c	125 - b
6 - c	21 - b	36 - d	51 - c	66 - d	81 - a	96 - a	111 - b	
7 - c	22 - c	37 - d	52 - a	67 - d	82 - c	97 - d	112 - c	
8 - c	23 - d	38 - a	53 - d	68 - c	83 - a	98 - d	113 - a	
9 - c	24 - d	39 - b	54 - a	69 - a	84 - a	99 - c	114 - c	
10 - c	25 - c	40 - c	55 - a	70 - b	85 - d	100 - c	115 - c	
11 - b	26 - b	41 - b	56 - c	71 - d	86 - c	101 - b	116 - a	
12 - a	27 - c	42 - a	57 - d	72 - c	87 - d	102 - d	117 - c	
13 - a	28 - a	43 - a	58 - c	73 - d	88 - a	103 - a	118 - b	
14 - b	29 - d	44 - c	59 - b	74 - d	89 - d	104 - b	119 - a	
15 - b	30 - d	45 - c	60 - d	75 - a	90 - d	105 - d	120 - a	

# GPAT 2019

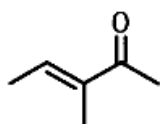
- As per the Medical Termination of Pregnancy Act and rules, the safe custody of "Forms" is with :
  - Standing committee
  - Registered Medical Practitioner
  - Owner of the approved place
  - Chief Medical Officer
- For protein detection most commonly used probe is :
  - Interferon
  - Antibody
  - Lectin
  - Antigen
- Consumer who are loyal to two-three brands are considered as :
  - Split loyals
  - Switcher loyals
  - Semi-core loyals
  - Shifting loyals
- Choose the CORRECT statement with respect to "The Pharmacy Act, 1948 :"
  - Education regulation 1991 dose not prescribe the minimum qualification for the registration as Pharmacist
  - Section 12 of the act deals with the approval of course of study under chapter 2 there of.
  - Section 12 of the act deals with the approval of course of study and examination under chapter 2 there of.
  - State Govt is authorised to make any rules with respect to course of study.
- ELISA is based upon
  - Antigen Protein Interaction
  - Antibody - protein Interaction
  - Antigen Antibody Interaction
  - Lectin - Antibody Interaction
- The relation between emissive power of the surface and its absorptivity is given by
  - Stefan - Boltzmann Law
  - Darcy's Law
  - Fourier's Law
  - Kirchhoff's Law
- In India the patent office has its head office at Kolkata and branch offices at :
  - Dibrugarh, Indore and Vapi
  - Kashmir, Ahmedabad and Trivandrum
  - Chandigarh, Hyderabad and Goa
  - Mumbai, Chennai and New Delhi
- Penalty for the cultivation of any cannabis plant to produce, sell purchase transport in contravention of Narcotic Drugs and Psychotropic substances Act and Rules on first conviction is
  - Rigorous imprisonment up to 10 years or fine up to Rs. 10 Lakhs
  - Rigorous imprisonment up to 10 years or fine up to Rs. 1 Lakh
  - Rigorous imprisonment up to 6 months
  - Fine up to Rs. 10 Lakh
- In Direct, Contact or Jet condensers, barometric leg serves one of the following functions :
  - To remove the condensate/cooling water mixture
  - To measure the pressure difference across the tube
  - To Heat the liquid feed to ifs boiling point
  - To transfer the feed in to the evaporating chamber
- Which of the following is considered as differentiated product ?
  - Ranitidine
  - Zantac
  - Isoniazid
  - Paracetamol
- Hardinge mill is a variant of :
  - Fluid energy mill
  - Ball mill
  - Hammer mill
  - Rotary cutter mill

## PHARMACEUTICAL CHEMISTRY

12. Retention hyperbilirubemia is caused due to
- (a) Choleric jaundice (b) Non clearance of bilirubin  
(c) Reflux of bilirubin into blood stream (d) Over production of bilirubin
13. What will be the Heat of vaporisation of 1 mole of water, when it has the entropy change ( $\Delta S$ ) of 35.2 cal/mole.deg (at 25°C) ?
- (a) 1.408 cal/ mole (b) 10489 cal/ mole  
(c) 8465 cal/ mole (d) 880 cal/mole
14. Identify the name of drug with the following structure :

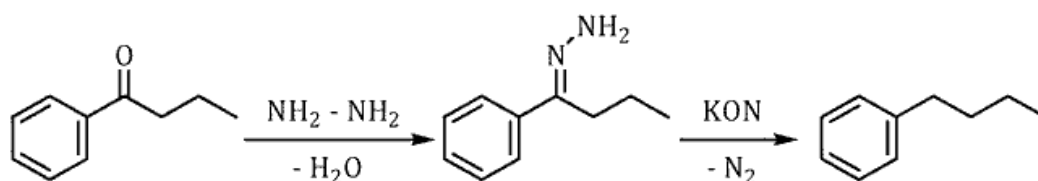


- (a) Esmolol (b) Betaxolol (c) Metoprolol (d) Bisoprolol
15. The following ACE inhibitor used in treating cardiovascular disorder is synthesized from the natural amino acids L-alanine and L-proline :
- (a) Ramipril (b) Enalapril (c) Insompril (d) Captopril
16. The infra-red absorption peaks of Nujol is due to vibrations involving
- (a) S - hstr and S - hdef (b) S - hstr and O - hdef  
(c) C - hstr and C - hdef (d) N - hstr and N - hdef
17. Permitted tolerance limit for a 100mL class B volumetric flask and 1000 mL class B volumetric flask according to BS 1792 specifications respectively are \_\_\_\_ mL
- (a) 0.15 and 0.80 (b) 0.80 and 0.30 (c) 1.00 and 10.00 (d) 0.15 and 1.5
18. Predict  $\lambda_{\text{max}}$  for  $\pi - \pi^*$  absorption band in the UV spectrum of following compound :



- (a) 237 nm (b) 215 nm (c) 241 nm (d) 240 nm
19. One of the following is a most commonly used protecting group for amines :
- (a) Para Methyl benzyl (PMB) (b) t-Butyloxy carbonyl (t-BOC)  
(c) Methoxy methylene (MOM) (d) Tetra hydro pyranyl oxy (THP)
20. Choose the correct sequence of process during Atomization in atomic absorption spectroscopy
- (a) Desolvation  $\rightarrow$  Nebulization  $\rightarrow$  Dissociation  $\rightarrow$  Volatilization  $\rightarrow$  Ionization  
(b) Nebulization  $\rightarrow$  Desolvation  $\rightarrow$  Volatilization  $\rightarrow$  Dissociation  $\rightarrow$  Ionization  
(c) Desolvation  $\rightarrow$  Nebulization  $\rightarrow$  Volatilization  $\rightarrow$  Dissociation  $\rightarrow$  Ionization  
(d) Nebulization Volatilization  $\rightarrow$  Desolvation  $\rightarrow$  Dissociation  $\rightarrow$  Ionization
21. Which among the following carrier gases has the highest thermal conductivity ?
- (a) Nitrogen (b) Oxygen  
(c) Helium (d) Compressed Air
22. Phase solubility Analysis curve is not a good tool for :
- (a) Complex formation (b) Bioavailability determination  
(c) Polymorph detection (d) Impurity detection

23.



Identify the named reaction;

- (a) Curtius Rearrangement (b) Clemmensen reduction  
 (c) Wolf-Kishner reduction (d) Wolf-Rearrangement
24. Which of the following inactive clotting factor is activated by the vitamin-K as a co-enzyme ?  
 (a) I, II, III, IV (b) II, V, IX, X  
 (c) II, V, VI, VIII (d) II, VII, IX, X
25. Identify the molecule which will not exhibit Dipole moment ?  
 (a) Carbon dioxide (b) Carbon monoxide (c) Chloroform (d) Ammonia
26. The following combination of drugs are used in treating severe travelers diarrhoea :  
 (a) Pyrimethamine and sulfadiazine (b) Trimethoprim and sulfadiazine  
 (c) Pyrimethamine and sulfamethoxazole (d) Trimethoprim and sulfamethoxazole
27. Reaction of an  $\alpha$ -halo ester with an aldehyde or ketone in the presence of a base like  $\text{NaNH}_2$  gives  $\alpha, \beta$ -epoxy carboxylic ester. This reaction is referred as : <http://www.xamstudy.com>  
 (a) Willgerodt rearrangement (b) Bamford steven reaction  
 (c) Darzen's glycidic synthesis (d) Bayer villiger rearrangement
28. Amylopectin, a component of starch gives ..... colour with iodine  
 (a) No colour (b) Green (c) Blue (d) Red-purple
29. Anti addition of bromine to trans-2-butene yields :  
 (a) Enantiomer and racemic mixture (b) Only racemic mixture  
 (c) Only enantiomers (d) Only meso compounds
30. Conversion of aryldiamium chloride to arylchloride can be achieved in the presence of :  
 (a) Copper (II) chloride (b) Copper (I) chloride  
 (c) Sodium chloride (d) Calcium chloride
31. Von Gierke's glycogen storage disease is due to defect of which enzyme :  
 (a) Phosphofructokinase (b) Glucosyl 4 - 6 transferase  
 (c) Glycogen phosphorylase (d) Glucose - 6 - phosphatase
32. The chief product obtained by the reaction of neo-pentyl bromide under  $\text{E}_1$  reaction conditions ;  
 (a) neo pentyl alcohol (b) 2-methyl-2-butene  
 (c) 2-methyl-1, 3-butadiene (d) 2-methyl butene
33. RNA molecules having intrinsic catalytic activity are called as .....  
 (a) mRNAs (b) Ribozymes (c) sn RNAs (d) rRNAs
34. This semi synthetic derivative of penicillin is synthesized by acylation of 6-APA with p-hydroxy phenyl glycine :  
 (a) Becampicillin (b) Amoxicillin (c) Ampicillin (d) Carbenicillin
35. Choose the correct product of the following reaction :  
 $\text{HNO}_3 + 2\text{H}_2\text{SO}_4 \rightleftharpoons ?$   
 (a)  $\text{H}_3\text{O}^{\oplus} + 2\text{HSO}_4^{\ominus} + \text{NO}_2^{\oplus}$  (b)  $\text{H}_2\text{O} + 2\text{HSO}_4^{\ominus} + \text{NO}_2^{\oplus}$   
 (c)  $\text{H}_3\text{O}^{\oplus} + 2\text{HSO}_4^{\oplus} + \text{NO}_2^{\oplus}$  (d)  $\text{OH} + 2\text{HSO}_4^{\oplus} + \text{NO}_2^{\ominus}$



36. Oxazole is prepared by the condensation of  $\alpha$ -amino carbonyl compound with
- (a) Amino acid (b) Isocyanide  
(c) Aminoether (d) Iminoester
37. Select the correct order of ortho/para directing ability Of the functional groups from those given below :
- (Strongest first, Weakest last)
- (a)  $-\text{NHCOR} > -\text{OH} > -\text{C}_6\text{H}_5 > \text{I}$  (b)  $-\text{NHCOR} > -\text{NH}_2 > -\text{C}_6\text{H}_5 > \text{I}$   
(c)  $-\text{NHCOR} > -\text{NR}_2 > -\text{C}_6\text{H}_5 > \text{I}$  (d)  $-\text{NHR} > -\text{NHCOR} > -\text{C}_6\text{H}_5 > \text{I}$
38. Blockade in  $\beta$ -oxidation results in :
- (a) Von Gierk's disease (b) Scurvy  
(c) Sudden infant death syndrome (d) Taruli' s disease
39. The basic ring system present in the antihypertensive and antiglaucoma drug Timolol" is:
- (a) 1, 3, 5 - Thiadiazole and Morpholine (b) 1, 3 - Thiazole and Morpholine  
(c) 1, 2, 5 - Thiadiazole and Morpholine (d) 1, 2, 4 - Thiadiazole and Morpholine
40. Dehydration of this dicarboxylic acid to obtain corresponding anhydride is difficult due to stereo chemical arrangement :
- (a) Malic acid (b) Fumaric acid (c) Glutaric acid (d) Succinic acid
41. Which of the following pair of drugs is considered as selective  $\alpha_1$  -Blockers ?
- (a) Timolol and Metoprolol (b) Prazosin and Terazosin  
(c) Formoterol and Levalbuterol (d) Yohimbine and Carynanthine
42. Calculate the accurate osmotic pressure at 00C of a blood serum sample using Lewis equation having freezing point  $-0.53^\circ\text{C}$
- (a) 0.636 atm (b) 6.39 atm (c) 574.28 atm (d) 0.0441 atm
43. PM indicators are used in :
- (a) Redox titrations (b) Non-Aquous titrations  
(c) Acid-base titrations (d) Complexometric titrations
44. Kinetically  $\frac{x}{a(a-x)} kt$  is the expression for:
- (a) First order reaction (b) Second order reaction  
(c) Pseudo first order reaction (d) Fractional order reaction
45. Conversion Of a carbonyl functionality directly to its hydrocarbon in basic media can be achieved by
- (a) Lithium aluminium hydride reduction (b) Clemmensen reduction  
(c) Sodium borohydride reduction (d) Wolf Kishner reduction
46. Which of the following second generation  $\beta_1$  - selective blockers contains 1, 3, 5 - thiadiazole ring in its structure ?
- (a) Sotalol (b) Timolol (c) Penbutolol (d) Pindolol
47. The structural features present in anti-cancer antibiotics (Doxorubicin, Daunorubicin, Idarubicin and Epirubicin) are
- (a) Naphthalene nucleus connected with amino sugar via glycosidic linkage  
(b) Anthracene nucleus fused to cyclohexane ring that is subsequently connected with amino sugar via glycosidic linkage  
(c) Quinoline nucleus connected with amino sugar via glycosidic linkage  
(d) Phenanthrene nucleus fused to cyclohexane ring that is subsequently connected with amino sugar Via glycosidic linkage

48. When 50 ml of sodium hydroxide (0.1 M) is added to 100 mL of 0.1 M acetic acid, pH of the resultant solution is .....
- $K_a$  of acetic acid =  $1.82 \times 10^{-5}$
- (a) 8.58                      (b) 7.42                      (c) 4.74                      (d) 7.06
49. Gabriel ring closure method is employed for the synthesis of :
- (a) 1,4-oxazine              (b) Aziridine              (c) Oxirane                      (d) Oxaziridine

## PHARMACEUTICS

50. "Shake well" label must be placed on the containers of :
- (a) Ophthalmic suspension                      (b) Occuserts  
(c) Ophthalmic solution                      (d) Ophthalmic gels
51. In case of Aerosol testing, valve delivering acceptance criteria for a volume of 54 mL or less
- (a)  $\pm 75\%$                       (b)  $\pm 5\%$                       (c)  $\pm 10\%$                       (d)  $\pm 15\%$
52. Containers may be rendered free from pyrogens by adequate cleaning and by:
- (a) Autoclaving at 121 °C for 15 minutes                      (b) Heating at 210 °C for 3-4 hours  
(c) Autoclaving at 121 °C for 1 hour                      (d) Heating at 100 °C for 3-4 hours
53. GMP regulation are pertaining to minimum requirements to be met by industry when :
- (a) Manufacturing, packaging and holding of human drugs and veterinary drugs  
(b) Manufacture of human drugs and veterinary drugs  
(c) Manufacture and packaging of human drugs and veterinary drugs  
(d) Manufacture and holding of human drugs and veterinary drugs
54. Which one of the following viscometers can be used for characterizing non-Newtonian system ?
- (a) Falling sphere viscometer                      (b) Cup and Bob viscometer  
(c) Capillary viscometer                      (d) Hoeppler viscometer
55. For drug substances with highly variable pharmacokinetic characteristics the following Bioequivalence study design is used
- (a) Parallel Design                      (b) Non-Replicate Design  
(c) Non-Parallel Design                      (d) Replicate Design
56. Roll-tube technique is the modification of :
- (a) Pour plate technique                      (b) The streak - plate technique  
(c) Micromanipulator technique                      (d) Spread plate technique
57. Which mechanism of metabolism of drug is not affected by weight change of patient ?
- (a) Conjugative metabolism                      (b) Acetylation metabolism  
(c) Hydrolytic metabolism                      (d) Oxidative metabolism
58. 21 CFR part 211 of USFDA describes :
- (a) Current good clinical practice                      (b) Current good packaging practice  
(c) Current good manufacturing practice                      (d) Current good laboratory practice
59. In treating immunodeficiency disease the goal is to maintain IgG levels at about :
- (a) 100 mg/ dL                      (b) 400 mg/ dL                      (c) 200 mg/ dL                      (d) 300 mg/ dL
60. Which one of the following is the property of micro-emulsion ?
- (a) They have particle size more than 1 micron  
(b) They have poor stability  
(c) They exhibit a viscoelastic gel phase, when internal phase is added in excess  
(d) They have milky yellow colour

61. The rheological and functional properties of synovial fluid are impaired due to :
- (a) Increase in the content of mucus (b) Decrease in the content of mucus  
(c) Increase in the content of hyaluronic acid (d) Decrease in the content of hyaluronic acid
62. Movement of charged particle through a liquid under the influence of an applied potential difference is known as
- (a) Sedimentation Potential (b) Streaming Potential  
(c) Electrophoresis (d) Electroosmosis
63. As per US FDA, NDA's for new chemical entities are classified as either :
- (a) 'P' for product review or 'S' for standard review  
(b) "P" for priority review or 'S' for standard review  
(c) 'P' for product review or 'S' for safety review  
(d) 'P' for priority review or 'S' for safety review
64. In preformulation study polymorphs can be detected by
- (a) Counter - current chromatography (b) Retractometry  
(c) High performance liquid chromatography (d) Differential scanning
65. The following is/are used to determine the amount of drug bound to a protein:
- (a) Equilibrium dialysis (b) Solubility (c) pH titration (d) Distribution method
66. In tablet, hydroxy propyl methyl cellulose is used as :
- (a) Diluent (b) Film former (c) Disintegrant (d) Binder
67. Dakin's solution is a synonym for :
- (a) Ammonium Acetate solution (b) Chlorinated soda solution  
(c) Chloroxylenol solution (d) Aluminium Acetate solution
68. MEDLINE, EMBASE, EBM AND IDIs are :
- (a) Drug databases (b) New compendial specification of drugs  
(c) Chronicles of drug standards (d) Source for drug patents
69. Theories of emulsification are characterized by one of the following EXCEPT:
- (a) Film formation (b) Phase inversion  
(c) Monomolecular adsorption (d) Solid particle adsorption
70. When two brands of a drug product gives same clinical results, it is termed as :
- (a) Therapeutic equivalence (b) Bio equivalence  
(c) Pharmaceutical equivalence (d) Clinical equivalence
71. Soda ash is also known as :
- (a) Lime stone (b) Sodium carbonate (c) Pure silica (d) Calcium carbonate
72. Microcrystalline cellulose is also called as :
- (a) Sugar tab (b) Nutab (c) Emdex (d) Avicel
73. Which of the following statement is NOT true regarding bulkiness ?
- (a) The reciprocal of bulk density is bulkiness  
(b) Bulkiest substance will require container larger than required for less bulky substance  
(c) Smaller particles shift between larger ones and increases bulkiness  
(d) Bulkiness increases with decrease in particle size
74. A mixture of emulsifier A and emulsifier B with values of 4 and 14 respectively are to be mixed in a proportion to get mixture with required HLB 12. What is the weight of individual emulsifier that is to be taken to have a total weight of 7 gm ?
- (a) A = 5.8 gm and B = 1.2 gm (b) A = 1.4 gm and B = 5.6 gm  
(c) A = 5.6 gm and B = 1.4 gm (d) A = 1.2 gm and B = 5.8 gm



75. Which of the following oxide is not used for achieving Amber color to glass ?  
 (a) Manganese (b) Iron (c) Cobalt (d) Carbon
76. In case of open model intravenous infusion,  $C_{ss}$  (steady state plasma concentration) is equal to :  
 (a)  $\frac{[\text{Plasma concentration}] [\text{Infusion rate}]}{\text{Clearance}}$  (b)  $\frac{[C_{max}] [\text{Infusion rate}]}{\text{Clearance}}$   
 (c)  $\frac{[t_{max}] [\text{Infusion rate}]}{\text{Clearance}}$  (d)  $\frac{\text{Infusion rate}}{\text{Clearance}}$
77. In case of suppositories base, SFI stands for :  
 (a) Solidified Fatty acid Indices (b) Solid Fluid Indices  
 (c) Solidified Fatty acid Incline (d) Solid Fat Index
78. If mean volume — number diameter of a powdered sample is  $2.41\mu\text{m}$ , density is  $3\text{ gm/cm}^3$ , the number of particles/gm will be .  
 (a)  $538 \times 10^{10}$  (b)  $3.68 \times 10^{10}$  (c)  $4.55 \times 10^{10}$  (d)  $4.70 \times 10^{10}$
79. Which polymorphic form of a drug candidate has highest melting point :  
 (a) Unstable (b) Metastable (c) Hydrates (d) Stable
80. For bitter drugs in paediatric formulations, excellent flavouring agent will be.  
 (a) Raspberry syrup (b) Orange syrup  
 (c) Lemon syrup (d) Black current syrup
81. The co-administration of erythromycin with cyclosporine :  
 (a) Increase bioavailability, due to inhibition of hepatic metabolism  
 (b) Increase bioavailability, due to inhibition of microflora in intestine  
 (c) Decrease bioavailability due to complex formation  
 (d) Decrease bioavailability, due to induction of hepatic metabolism
82. Essentially Hospital Formulary system provide mechanism to :  
 (a) Streamline prescription writing (b) Improve quality and hygenicity of food  
 (c) Avoid brand and therapeutic duplication (d) Improve surgical procedures
83. Volume of blood that flows per unit time per unit volume of the tissue is :  
 (a) Residence time (b) Elimination rate  
 (c) Gastric emptying rate (d) Perfusion rate
84. Leaching by immersion Of crude material in a solvent is also known as :  
 (a) Maceration (b) Precipitation (c) Evaporation (d) Crystallization
85. The protein toxins that have been modified to reduce the toxicity without significantly altering the immunogenicity are known as :  
 (a) Sera (b) Antisera (c) Toxoids (d) Vaccines
86. Which of the following is NOT a mechanism for achieving gastroretention ?  
 (a) Osmosis (b) Floating (c) Mucoadhesion (d) Swelling
87. The phase contrast microscopy is valuable in studying living cells which are :  
 (a) Stained (b) Unstained  
 (c) Treated with fluorescent dye (d) Treated with fluorescent antibody

## PHARMACOGNOSY

88. The size Of *Lycopodium* sp ores is :  
(a) 45  $\mu\text{m}$  (b) 15  $\mu\text{m}$  (c) 35  $\mu\text{m}$  (d) 25  $\mu\text{m}$
89. Reghokarrhenines A-F have been isolated from :  
(a) Veratrums (b) Areca (c) Aconite (d) Kurchi
90. Pungency of *Zingiber officinale* rhizome is due to the presence of :  
(a) Citral (b) Gingerol (c) Commiphoric acid (d) Gingeral
91. The principal cultivation areas of pyrethrum flowers are in -  
(a) Sri Lanka (b) Malaysia (c) India (d) Kenya
92. In *Cassia angustifolia* short-term drought :  
(a) Increases the concentration of sennosides A + B  
(b) Decreases the concentration of sennosides A + B  
(c) Causes loss of leaf biomass  
(d) Causes death of the plant
93. The Glycoside Scilliroside in red squill acts as :  
(a) Insecticide (b) Rodenticide (c) Acaricide (d) Molluscide
94. Shellac is a resinous substance produced from a secretion that encrusts the bodies of a scale insect :  
(a) *Viverra civet* (b) *Karria lacca*  
(c) *Acipenser huso* (d) *Alverites moschiferus*
95. All members of this order are trees or shrubs; mostly evergreen with needle - like leaves ; monoecious or dioecious - sporophylls usually in cones. Resin ducts occur in all parts :  
(a) Cycadales (b) Ginkgoales (c) Taxales (d) Coniferae
96. In Gambir - fluorescein test the petroleum spirit layer shows a strong :  
(a) Green fluorescence (b) Blue fluorescence  
(c) Yellow fluorescence (d) Red fluorescence
97. Antiviral action of Neem is due to :  
(a) Kaemferol (b) Nelanin (c) Nimbin (d) Azadirachitin

## PHARMACOLOGY

98. Characteristic microscopic features observed in Alzheimer's disease is:  
(a) Epidural haemorrhagic patches  
(b) Depigmentation of substantia nigra  
(c) Demyelination of neurons in spinal cord  
(d) Presence of neuritic plaques containing Ab-amyloid
99. Cardiac output is:  
(a) Volume of blood ejected by the auricle per minute  
(b) Volume of the blood ejected by the left ventricle per beat  
(c) Volume of the blood ejected by the left ventricle per minute  
(d) Volume of blood ejected by the auricles per beat
100. What are sutures?  
(a) Cartilaginous joints (b) Non fibrous joints  
(c) Synovial joints (d) Fibrous joints of the skull

**101.** Following are the facts regarding clinical applications of muscarinic receptor blocking drugs.

Identify the false statement:

- (a) Used in the treatment of parkinson's disease is often an exercise in polypharmacy, since no single agent is fully effective.
- (b) Marked reflex vagal discharge may stimulate sinoatrial oratrioventricular node to improve cardiac output
- (c) Mydriasis produced greatly facilitates ophthalmoscopic examination of the retina and measurement of refractive error in uncooperative patient
- (d) Scopolamine is one among the old remedies used to treat sea-sickness

**102.** Which of the following cells are called scavenger cells?

- (a) Neutrophils
- (b) Natural killer cells
- (c) Macrophages
- (d) Mast cells

**103.** Which is NOT true about calcitriol?

- (a) It is active form of Vit D<sub>3</sub>
- (b) It enhances reabsorption of calcium and phosphate from bone
- (c) It prevents tubular reabsorption of calcium and phosphate
- (d) Enhances absorption of calcium and phosphate from intestine

**104.** Production of an abnormal IgG immunoglobulin in Grave's disease causes:

- (a) Multinodular goitre
- (b) Hypothyroidism
- (c) Thyrotoxicosis
- (d) Rheumatoid arthritis

**105.** Metabolic acidosis does NOT occur during :

- (a) Starvation
- (b) Chronic renal failure
- (c) Wound healing
- (d) Uncontrolled diabetes mellitus

**106.** Glucocorticoids have following effects - EXCEPT:

- (a) Stimulation of immune responses
- (b) Resistance to stress
- (c) Lipolysis
- (d) Protein breakdown and glucose formation

**107.** Which one of the following is NOT the role of Nitric oxide?

- (a) Reliving vascular smooth muscle
- (b) Mediating microbicidal action of macrophages
- (c) Serving as neurotransmitter in CNS
- (d) Inducing platelet aggregation

**108.** Identify the drug which is not useful in the treatment of tuberculosis:

- (a) Pyrazinamide
- (b) Gentamicin
- (c) Streptomycin
- (d) Ciprofloxacin

**109.** What is anaplasia?

- (a) Morphological and functional alterations/changes, that are different from normal cells
- (b) Morphological and functional resemblance to normal cells
- (c) Increase in size of cell
- (d) Lack of growth of cells

**110.** Match the following liver abnormalities with consequences:

- (a) Steatosis (M) Raised bilirubin level
- (b) Cholestasis (N) Slight rise in serum transaminase level
- (c) Hepatitis (O) Accumulation of fat droplets within liver cells
- (d) Fibrosis (P) Elevated liver function test (LFT's)

- (a) (a) - (N), (b) - (P), (c) - (M), (d) - (O)
- (b) (a) - (O), (b) - (M), (c) - (P), (d) - (N)
- (c) (a) - (N), (b) - (O), (c) - (P), (d) - (M)
- (d) (a) - (P), (b) - (O), (c) - (N), (d) - (M)

**111.** Numerous isomers of human liver P450 enzyme have been identified, it is not worthy that \_\_\_\_ alone is responsible for the metabolism of over 55% of the prescription drugs metabolized by liver:

- (a) CYP3A4
- (b) CYP1A2
- (c) CYP1A11
- (d) CYP2B6

**112.** Which of the following directly inhibits Factor Xa?

- (a) Dabigatran
- (b) Warfarin
- (c) Bivalirudin
- (d) Rivaroxaban

- 113.** Which of the following anticonvulsants have both inhibition of excitatory glutamatergic synapse and facilitation of GABA mediated Cl channel opening action?  
 (a) Valproate            (b) Ethosuximide        (c) Topiramate            (d) Phenytoin
- 114.** Which of the following is NOT a cardioselective  $\beta$  blocker?  
 (a) Bisoprolol            (b) Nebivolol            (c) Acebutolol            (d) Pindolol
- 115.** The term 'aneurysm' refers to:  
 (a) Permanent blockage of blood vessels  
 (b) Permanent abnormal dilatation of blood vessel  
 (c) Abnormal connections in blood vessels  
 (d) Abnormal growth of neurones near blood vessels
- 116.** The antiemetic activity of glycopyrronium is related to potent inhibition of ..... receptor both peripherally and centrally.  
 (a)  $5HT_3$                     (b)  $D_2$                     (c)  $M_1$                     (d)  $H_1$
- 117.** Identify the false statement about benzodiazepines from the following:  
 (a) Benzodiazepines cause reduction of anxiety  
 (b) Benzodiazepines cause convulsions  
 (c) Benzodiazepines produce muscle relaxation and loss of motor co-ordination  
 (d) Benzodiazepines are useful in insomnia
- 118.** Which of the following is 5-alpha reductase inhibitor?  
 (a) Gliclazide            (b) Sildenafil            (c) Finasteride            (d) Polvthiazide
- 119.** Several different chemicals released by microbes and inflamed tissues attract phagocytes, this phenomenon is called as .....  
 (a) Phagocytosis        (b) Integrins            (c) Chemotaxis            (d) Emigration
- 120.** Hematocrit 65% to 70% indicates:  
 (a) Hemophilia            (b) Polycythemia        (c) Hypoxia                (d) Anaemia
- 121.** The adverse reaction associated with  $\beta_2$  agonists administered by inhalation or nebulisation in the management of asthma does not include .....  
 (a) Peripheral vasodilation                    (b) Hypertension  
 (c) Tachycardia                                    (d) Fine tremor
- 122.** Select the ulcer protective drug from the following:  
 (a) Oxyphenonium        (b) Metronidazole        (c) Misoprostol            (d) Sucralfate
- 123.** Disturbances of oestrogen/progesterone balance could cause a relative deficiency of ..... leading to disturbances in production of dopamine and serotonin. This contributes for emotional disturbances and depression.  
 (a) Enzyme decarboxylase        (b) Tyrosine            (c) Pyridoxine phosphate        (d) Co-factor A
- 124.** Testing of chemicals by OECD guideline No. 420 refers to which of the following:  
 (a) Ate oral toxicity by acute toxic class method  
 (b) Acute oral toxicity by up and Down procedure  
 (c) Repeated dose 28-day toxicity study in rodents  
 (d) Acute oral toxicity by fixed dose procedure
- 125.** Which of the following is true?  
 Excessive use of diuretics can lead to:  
 (a) Hypervolemic shock                                    (b) Neurogenic shock  
 (c) Hypovolemic shock                                    (d) Cardiogenic shock

## ANSWER KEY GPAT 2019

1-c	2-b	3-a	4-c	5-c	6-b	7-d	8-b	9-a	10-b
11-b	12-d	13-b	14-d	15-b	16-c	17-b	18-a	19-b	20-b
21-c	22-b	23-c	24-d	25-a	26-d	27-c	28-d	29-d	30-b
31-d	32-b	33-b	34-b	35-a	36-d	37-d	38-c	39-c	40-b
41-b	42-a	43-d	44-b	45-d	46-b	47-b	48-c	49-b	50-a
51-d	52-b	53-a	54-b	55-d	56-b	57-d	58-c	59-c	60-c
61-d	62-c	63-b	64-d	65-a	66-b	67-b	68-a	69-b	70-a
71-b	72-d	73-c	74-b	75-c	76-d	77-d	78-c	79-d	80-a
81-a	82-c	83-d	84-a	85-c	86-a	87-b	88-d	89-d	90-b
91-d	92-a	93-b	94-b	95-d	96-a	97-c	98-d	99-c	100-d
101-b	102-c	103-c	104-c	105-c	106-a	107-d	108-b	109-a	110-b
111-a	112-d	113-a	114-d	115-b	116-c	117-b	118-c	119-c	120-b
121-b	122-d	123-c	124-d	125-c					



## GPAT QUESTION PAPER 2018 WITH ANSWER KEY

1. A technique of using very small metal particles coated with desired DNA in the gene transfer is called:-

- (a) Microinjection
- (b) Biolistic
- (c) Liposome mediated
- (d) Electroporation

2. Arrange the following steps in sequence of their order for production of recombinant Insulin:-

A. Fusion of A and B chains for disulphide bond.

B. Cynogen bromide treatment to remove methi onine and  $\hat{a}$  galactosidase.

C. Introduction of A and B chain in the plasmid containing  $\hat{a}$  galactosidase g ene.

D. Synthesis of A and B chain in E coli.

- (a) a  $\rightarrow$  b  $\rightarrow$  d  $\rightarrow$  c
- (b) d  $\rightarrow$  c  $\rightarrow$  a  $\rightarrow$  b
- (c) c  $\rightarrow$  d  $\rightarrow$  b  $\rightarrow$  a
- (d) b  $\rightarrow$  a  $\rightarrow$  d  $\rightarrow$  c

3. Motif is represented by:-

- (a) Commas repeated on the lattice
- (b) 3D translational periodic arrangement of points
- (c) Geometric shapes of lattice
- (d) Centre of symmetry in lattice

4. Statement 1 : Vortex formation can be minimized by push pull mechanism.

Statement 2 : Vortex formation reduces the mixing intensity by increasing the velocity of impeller.

- (a) True, False
- (b) True, True
- (c) False, False
- (d) False, True

5. Which of the following fluid can be considered as an ideal fluid?

- (a) Viscous fluid
- (b) Non-viscous fluid
- (c) Compressible fluid
- (d) All of these

6. Which of the following agencies is not classified as an 'executive agency' for administration

of the act under the provision of Drugs and Cosmetics Act 1940?

- (a) Licensing authority
- (b) Drug inspectors
- (c) Drugs Consultative Committee
- (d) Customs collectors

7. As per Factories Act 1948, in CHAPTER VI dealing with working hours of adults, no adult worker shall be required or allowed to work in a factory for more than \_\_\_\_\_ hours in a week.

- (a) 30
- (b) 40
- (c) 48
- (d) 56

8. Henri Fayol's principle "Espirit de corps" means:-

- (a) Corporate objective
- (b) Group objective
- (c) Team activity
- (d) Team spirit

9. How customer's bias about the product will influence the marketing communication?

- (a) Positive effect
- (b) Negative effect
- (c) No effect
- (d) Both positive and Negative

10. Which of the following is not patentable in India as per The Patents Act 1970?

- (a) New product
- (b) New process
- (c) New use of existing drug
- (d) New process for existing drug

11. Match the following enzymes in Column I with their respective functions under Column II

Column I

Column II

i. DNA ligase

(p) Synthesize a DNA copy of RNA

ii. Alkaline phosphatase

(q) Forms a bond between 3' -OH and 5'-PO<sub>4</sub>

iii. Reverse transcriptase

(r) Removes terminal PO<sub>4</sub> from 3' or 5' end of DNA

iv. Polynucleotide kinase

(s) Adds phosphate to 5' -OH end

(a) i-r, ii-s, iii-p, iv-q

(b) i-p, ii-q, iii-r, iv-s

- (c) i-q, ii-r, iii-p, iv-s  
 (d) i-s, ii-p, iii-q, iv-r

12. Which of the following replacement of amino acid in a protein may produce greatest change in its conformation?

- (a) Ser → Thr  
 (b) Glu → Val  
 (c) Gln → Tyr  
 (d) Phe → Ile

13. The hexose monophosphate pathway produces distinctively two useful products. Identify these products with the ratio in which they are produced.

- (a) One NADPH to two ribose-6-phosphate  
 (b) Two NADPH to one ribose-5-phosphate  
 (c) Two NADPH to one ribulose-5-phosphate  
 (d) Two NADPH to one fructose-6-phosphate

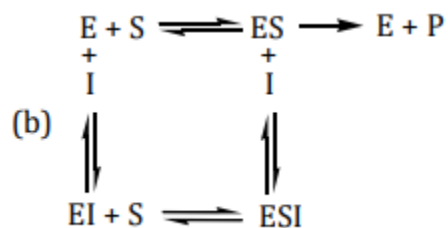
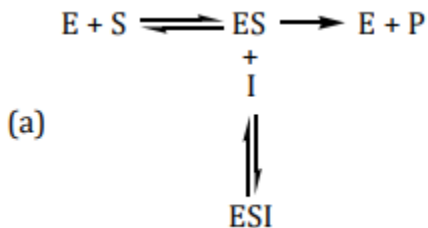
14. The correct statement about Vitamin D is:-

- (a) The oral administration of 1, 25-dihydroxycholecalciferol is required in chronic renal failure  
 (b) 25-Hydroxycholecalciferol is the active form of the vitamin  
 (c) Vitamin D antagonizes the effects of parathyroid hormone  
 (d) A deficiency of vitamin D causes an increase in calcitonin secretion

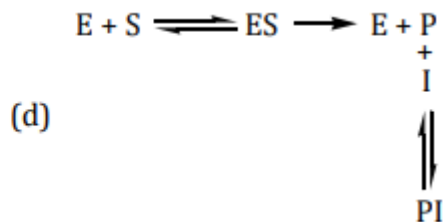
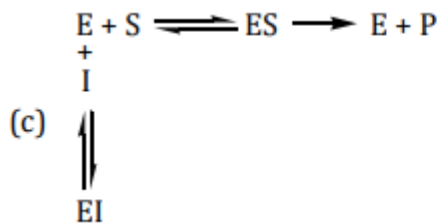
15. All of the following enzymes are used in ELISA except:-

- (a) Glucose oxidase  
 (b) Alkaline phosphatase  
 (c) Coagulase  
 (d) β-galactosidase

16. Which of the following equilibrium suggests noncompetitive inhibition of enzyme E for conversion of substrate S to product P with inhibitor I?







17. Which method is used for the Limit test for arsenic?

- (a) Gutzeit method
- (b) Oswald method
- (c) Arrhenius method
- (d) Karl-Fischer method

18. The agent used to prevent the dental carries is:-

- (a) Sodium fluoride
- (b) Strontium chloride
- (c) Zinc chloride
- (d) Dicalcium phosphate

19. Which of the following definitions of an asymmetric reaction is the most accurate?

- (a) A reaction that creates a new chiral centre in the product
- (b) A reaction that involves a chiral reagent
- (c) A reaction which creates a new chiral centre with selectivity for one enantiomer/diastereoisomer over another
- (d) A reaction that is carried out on an asymmetric starting material

20. What software programme is used to determine the Verloop steric parameter in QSAR?

- (a) Alchemy
- (b) Chem3D
- (c) Sterimol
- (d) Chem-Draw

21. The oral oligosaccharide hypoglycemic agent, which is administered at the start of the meal is:-

- (a) Pioglitazone
- (b) Miglitol
- (c) Acarbose
- (d) Glimepride

22. Which functional group is crucial for anti-malarial activity of artemisinin?

- (a) Aldehydic functional group
- (b) Ethylene bridge

- (c) Ketonic functional group
- (d) Peroxide bridge

23. Select the drug which exhibits dual alpha and beta adrenergic receptor agonists activity.

- (a) Terbutaline
- (b) Clonidine
- (c) Metaproterenol
- (d) Dobutamine

24. Appropriate hybridization schemes for the C atoms in molecule  $\text{CH}_3\text{CO}_2\text{H}$  are:-

- (a)  $\text{sp}^3$  and  $\text{sp}$
- (b)  $\text{sp}^3$  and  $\text{sp}^2$
- (c)  $\text{sp}^2$  and  $\text{sp}$
- (d)  $\text{sp}^3$  and  $\text{sp}^3$

25. In Universal indicators, a pH of 7 is shown with:-

- (a) Yellow color
- (b) Green color
- (c) Blue color
- (d) Pink color

26. Which statement regarding Hückel's rule is FALSE?

- (a) There must be  $(4n + 2)$  pi ( $\pi$ ) electrons
- (b) The molecule must be planar
- (c) The molecule must be cyclic
- (d) Each of the pi ( $\pi$ ) electrons must be associated with a conjugated double bond

27. Anthracene is isomeric with:-

- (a) Phenanthrene
- (b) Naphthalene
- (c) Benzene
- (d) Azulene

28. The molecular formula of phenanthrene is:-

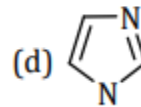
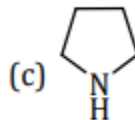
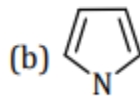
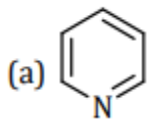
- (a)  $\text{C}_{14}\text{H}_{10}$
- (b)  $\text{C}_{12}\text{H}_{10}$
- (c)  $\text{C}_{14}\text{H}_{14}$
- (d)  $\text{C}_{14}\text{H}_8$

29. In electrophilic substitution of pyridine, reaction of pyridine with  $\text{H}_2\text{O}_2$  in acetic acid leads

to formation of:-

- (a) 1,4-Dihydropyridine
- (b) 2-Hydroxypyridine
- (c) 2-Pyridone
- (d) Pyridine-N-oxide

30. Which compound is most basic?



31. Correct Nomenclature for the following bridged bicyclic ring system is:-

- (a) bicyclo[4.4.0] decane
- (b) bicyclo[4.3.0] decane
- (c) bicyclo[4.3.1] decane
- (d) bicyclo[4.4.1] decane

32. Which among the following correctly defines Diastereomer?

- (a) These have same magnitude but different signs of optical rotation
- (b) Nonsuperimposable object mirror relationship
- (c) These differ in all physical properties
- (d) Separation is very difficult

33. Galactose and Glucose are:-

- (a) Epimers
- (b) Anomers
- (c) Isomers
- (d) Ketose-Aldose isomers

34. Which among the following is a non-essential amino acid?

- (a) Lysine
- (b) Threonine
- (c) Serine
- (d) Histidine

35. Which of the following is a 3,3-sigmatropic reaction which converts a 1,5-diene to an isomeric 1,5 diene?

- (a) Cope rearrangement
- (b) Claisen rearrangement
- (c) Photochemical [2+2] reaction
- (d) Diels-Alder reaction

36. What quantity of an indicator solution shall be added when quantity is not mentioned in an assay or test?

- (a) 0.1 ml
- (b) 0.05 ml
- (c) 0.2 ml
- (d) 0.5 ml

37. In Kjeldahl method, sample containing nitrogen is digested with \_\_\_\_\_.

- (a) Concentrated sodium hydroxide
- (b) Fuming nitric acid
- (c) Concentrated sulphuric acid
- (d) Strong ammonia solution

38. What is the concentration of paracetamol in a 0.1 N sodium hydroxide solution, whose absorption in a 1 cm cell at its  $\lambda_{\max}$ , 257 nm, was found to be 0.825? The A (1%, 1 cm) in the IP monograph of paracetamol is given as 715 at 257 nm

- (a) 1.1 g/100 ml
- (b) 0.0011 mg/100 ml
- (c) 0.0011 g/100 ml
- (d) 0.0011  $\mu\text{g}/100\text{ ml}$

39. The unit for specific absorbance A (1%, 1cm) is:-

- (a)  $\mu\text{g}/\text{mL}$
- (b)  $\text{mg}/\text{L}$
- (c)  $\text{liter mole}^{-1} \text{cm}^{-1}$
- (d)  $\text{dl g}^{-1} \text{cm}^{-1}$

40. What is the nuclear magnetic resonance frequency of 1H in a 7.05 Tesla magnetic field strength?

- (a) 300.0 MHz
- (b) 200.0 MHz
- (c) 60.0 MHz
- (d) 100 MHz

41. What is Hydrogen Deficiency Index (HDI) value for toluene?

- (a) 1
- (b) 2
- (c) 3
- (d) 4

42. In NMR, the aromatic proton resonate in a characteristic narrow range at:-

- (a)  $\delta$  6.5 –  $\delta$  8.0
- (b)  $\delta$  11.0 –  $\delta$  12.0
- (c)  $\delta$  2.0 –  $\delta$  4.0
- (d)  $\delta$  0.7 –  $\delta$  1.3

43. The difficulties of long elution time and poor resolution of complex mixtures are observed in elution analysis. These difficulties can be overcome by modification of elution analysis, known as:-

- (a) Isocratic-elution analysis
- (b) Gradient-elution analysis
- (c) Displacement analysis
- (d) Frontal analysis

44. Materials whose consistency depends on the duration of shear, as well as on the rate of shear, exhibit:-

- (a) Rheopexy
- (b) Thixotropy
- (c) Viscoelasticity
- (d) Plasticity

45. Which of the following solutions are more likely to have the same osmotic pressure?

Solutions of:

- (a) Diluted nonelectrolytes with the same molal concentration
- (b) Concentrated nonelectrolytes with the same molal concentration
- (c) Diluted electrolytes with the same molal concentration
- (d) Concentrated electrolytes with the same molal concentration

46. Which statements are correct for the micelle formation?

- (P) Micelles are dynamic structures that are continually formed and broken down in solution.
- (Q) The typical micelle diameter is about 2–3  $\mu\text{m}$  and so they are visible under the light micro scope.
- (R) Micelle formation is a spontaneous process.
- (S) When the surfactant concentration is increased above the CMC, the number of micelles increases and the free surfactant concentration decreases below CMC.

- (a) P and Q
- (b) P and R
- (c) P and S
- (d) R and S

47. Which equation is used to predict the stability of a drug product at room temperature from experiments at accelerated temperature?

- (a) Higuchi equation
- (b) The Arrhenius' equation
- (c) Hildebrand equation
- (d) The Hixson-Crowell equation

48. Which statement correctly describes Hess's Law?

- (a) The enthalpy of all reactants in their standard states is defined as zero
- (b) Enthalpy changes can be calculated only if one or more of the reactants is/are element
- (c) The enthalpy change of a reaction can be calculated only at 1 atm pressure and 25 °C
- (d) The enthalpy change of a reaction is independent of the route of reaction

49. Identify the starting material A and B in the synthesis of Clomifene.

- (a) Where A 4-hydroxy-benzophenone and B 2-diethylamino-ethyl chloride
- (b) Where A 4-hydroxy benzaldehyde and B 4-methoxy aniline
- (c) Where A 4-hydroxy-benzophenone and B 4-methoxy aniline
- (d) Where A 4-hydroxy-benzophenone and B benzaldehyde

50. The role of glutathione in tissues includes all except:-

- (a) Participate in decomposition of hydrogen peroxide
- (b) Participate in activation of methionine
- (c) Participate in detoxification reactions
- (d) Biologically active in oxidized form

51. When  $K_e$  is constant and  $K_a$  is larger:-

- (a)  $C_{max}$  is more and  $t_{max}$  is longer
- (b)  $C_{max}$  is lesser and  $t_{max}$  is longer
- (c)  $C_{max}$  is lesser and  $t_{max}$  is short
- (d)  $C_{max}$  more and  $t_{max}$  is short

52. When considering drug delivery to the brain which of the following is false?is short

- (a) The cells in the blood vessels that supply the brain are tightly connected which restricts drug absorption
- (b) Only relatively small lipophilic molecules readily, passively diffuse in to the brain
- (c) Drugs with a low log P value show improved passive diffusion into the brain (P: oil / water partition coefficient)
- (d) Polar molecules can be taken up into the brain through active transport

53. IVIVC utilizes the principles of statistical moment analysis:-

- (a) Level A
- (b) Level B

- (c) Level C
- (d) Level D

54. The systems that follows, Weibull Mathematical Model used to describe drug release kinetics are:- <http://www.xamstudy.com>

- (a) Swellable polymeric devices
- (b) Diffusion matrix formulation
- (c) Erodible matrix formulation
- (d) Transdermal system

55. Which method is used by pharmacists for complete blending of potent powders with large quantities of diluents?

- (a) Spatulation
- (b) Levigation
- (c) Trituration
- (d) Geometric dilution

56. Substance used to reduce friction during tablet compression and facilitate ejection of tablets from the die cavity is called as:-

- (a) Lubricant
- (b) Glidant
- (c) Anti-adherent
- (d) Humectant

57. What quantities of 95% v/v and 45% v/v alcohols are to be mixed to make 800 mL of 65% v/v alcohol?

- (a) 480 mL of 95% and 320 mL of 45% alcohol
- (b) 320 mL of 95% and 480 mL of 45% alcohol
- (c) 440 mL of 95% and 360 mL of 45% alcohol
- (d) 360 mL of 95% and 440 mL of 45% alcohol

58. The proportion of NaCl liquid to give 1.5% solution of drug isotonic with blood plasma is:- (The freezing point of 1% w/v solution of drug is  $-0.122$  and NaCl is  $-0.576$  °C)

- (a) 0.79%
- (b) 0.585%
- (c) 0.9%
- (d) 0.5%

59. Which of the following statement is NOT TRUE about prokaryotes?

- (a) Nucleus is not bounded by nuclear membrane

- (b) Cell wall contains peptidoglycan
- (c) 80S ribosomes are distributed in cytoplasm
- (d) It is Haploid in nature

60. Match the following diseases under column I with the respective causative organisms under Column II.

Column I

- i. Creutzfeldt-Jacob disease
- ii. Typhus
- iii. Syphilis
- iv. Plague

Column II

- p. Yersinia pestis
- q. Prions
- r. Rickettsia prowazekii
- s. Treponema palladium

- (a) i-r, ii-s, iii-p, iv-q
- (b) i-p, ii-q, iii-r, iv-s
- (c) i-q, ii-r, iii-s, iv-p
- (d) i-s, ii-p, iii-q, iv-r

61. As the dielectric constant values increases, the polarity of the solvents \_\_\_\_\_.

- (a) Decreases
- (b) Increases
- (c) Remains constant
- (d) Decreases and then remains constant

62. The angle of repose is calculated by \_\_\_\_\_.

- (a)  $\tan \alpha = \text{Radius/Height}$
- (b)  $\tan \alpha = 1 + \text{Radius/Height}$
- (c)  $\tan \alpha = 1 - \text{Radius/Height}$
- (d)  $\tan \alpha = \text{Height/Radius}$

63. Spray drying / spray congealing method is generally used to prepare \_\_\_\_\_.

- (a) Tablets
- (b) Microcapsules
- (c) Capsules
- (d) Ointments

64. HLB value of tragacanth is:-

- (a) 4.7
- (b) 8.7
- (c) 13.2
- (d) 14.3



65. Vials and bottles are regularly not subjected to following test:-

- (a) Sterility test
- (b) Clarity test
- (c) Leaker (chamber) test
- (d) Pyrogen test

66. As per USP, test limit for treated soda lime glass with container size of 200 ml is:-

- (a) 0.70ml of 0.02N Acid
- (b) 1.0ml of 0.2N Acid
- (c) 0.20ml of 0.02N Acid
- (d) 0.70ml of 0.2N Acid

67. In plasma, phenobarbital is present as ionized and unionized forms in equal amount because:-

- (a) It is weakly acidic drug
- (b) It is weakly basic drug
- (c) pH of plasma is 6.8
- (d) pKa of the phenobarbital is 7.4

68. A material which is insoluble and inert and used in matrix tablet formulation is:-

- (a) Polyethylene
- (b) Stearyl alcohol
- (c) Polyethylene glycol
- (d) Triglycerides

69. Which test is done for USP Type-I glass containers for injections?

- (a) Water attack test
- (b) Powdered glass test
- (c) Powdered glass followed by water attack test
- (d) Water attack followed powdered glass test

70. Isoelectric point of Type A gelatin is \_\_\_\_\_.

- (a) pH 7.0
- (b) pH 4.7
- (c) pH 9.0
- (d) pH 7.4

71. What is the effective ratio of methyl paraben and propyl paraben for anti-microbial activity?

- (a) 1:1
- (b) 5:1

- (c) 2.5:1
- (d) 10:1

72. Which of the following formula is used to determine shelf life as per first order reaction?

- (a)  $t_{90} 0.693/k$
- (b)  $t_{90} 0.104/k$
- (c)  $t_{1/2} 0.693/k$
- (d)  $t_{1/2} 0.105/k$

73. Following are endogenous carriers use for targeted drug delivery except:-

- (a) Lipoprotein
- (b) Serum Albumin
- (c) Erythrocyte
- (d) Microparticulates

74. The friability issue of the tablet can be solved by different ways except:-

- (a) Increasing the upper punch pressure of tablet machine
- (b) Addition of more tablet binder to granules
- (c) Increasing the moisture content of granules
- (d) Adjusting the lower punch pressure of tablet machine

75. What are the specific surface per unit volume  $S_v$  of spherical particles with density of  $3 \text{ gm/cm}^3$  and volume surface diameter,  $d_{vs}$  of  $2.57 \mu\text{m}$ ?

- (a)  $7.78 \times 10^3 \text{ cm}^2/\text{cm}^3$
- (b)  $2.33 \times 10^3 \text{ cm}^2/\text{cm}^3$
- (c)  $1.55 \times 10^3 \text{ cm}^2/\text{cm}^3$
- (d)  $1.00 \times 10^3 \text{ cm}^2/\text{cm}^3$

76. In a free-flowing powder, the bulk density and tapped density would be close in value, therefore, the Carr index would be:-

- (a) Small
- (b) Medium
- (c) Large
- (d) None

77. Buffer capacity is also referred to as:-

- (a) Buffer index
- (b) Buffer value
- (c) Buffer efficiency
- (d) All of these

78. Keesom interactions has a force of:-

- (a) 0.5- 1 kcal/mol
- (b) 1-7 kcal/mol
- (c) 1-3 kcal/mol
- (d) None of these

79. Dipole - induced dipoles are also known as:-

- (a) London forces
- (b) Keesom forces
- (c) Debye forces
- (d) Hydrogen bonding

80. The interfacial tension of Oleic acid against water at 20°C is:-

- (a) 15.6
- (b) 52.3
- (c) 428
- (d) 8.51

81. Suspensions of starch in water exhibit:-

- (a) Plastic flow
- (b) Pseudoplastic flow
- (c) Dilatant flow
- (d) None of these

82. Very weak bases having  $pK_a < 5$ :-

- (a) Are ionized in the entire pH range of GIT
- (b) Absorbed only in stomach
- (c) Are unionized at all pH values
- (d) None of these

83. During determination of absorption rate constant by method of residual, flip-flop phenomenon occurs when ( $K_a$  absorption rate constant and  $K_E$  overall elimination rate constant).

- (a)  $K_E/K_a \geq 3$
- (b)  $K_a/K_E \geq 3$
- (c)  $K_E/K_a \leq 3$
- (d)  $K_a/K_E \leq 3$

84. Which of the following disinfectant effectively destroys vegetative bacterial cells including

Gram positive and Gram negative bacteria, bacterial endospores, fungi, and viruses?

- (a) 8% formaldehyde + 70% alcohol
- (b) 70% Alcohol
- (c) 0.1% Phenol aqueous
- (d) 0.1% Iodine aqueous

85. Which of the following are obligatory intracellular parasites?

- (P) Virus      (Q) Fungus      (R) Mycobacterium      (S) Rickettsia
- (a) all
  - (b) (P), (Q) and (R)
  - (c) (R) and (S)
  - (d) (P) and (S)

86. Select the correct statement.

- (a) Acids salt corresponding to an insoluble salt will be more water soluble than original salt
- (b) Hydroxides and oxides of compounds other than alkali metal cations and the common ions are generally water soluble
- (c) Sulphides are water soluble except for their alkali metal salts
- (d) Ammonium and Quaternary ammonium salts are water insoluble

87. What is the viscosity of resulting liquid after mixing 300mL of liquid A ( $\eta=1.0$  cP) with the 200mL of liquid B ( $\eta=3.4$  cP)?

- (a) 2.2 cP
- (b) 1.4 cP
- (c) 1.6 cP
- (d) 1.8 cP

88. A compound now increasingly used as standard practice for enhancing the flow of rubber latex by spraying on to the scraped bark of the rubber tree increasing the latex yields from 36% to 130% is:-

- (a) Brassinosteroids
- (b) Abscisic acid
- (c) Ethephon
- (d) Kinetin

89. The constituent of Cochineal is:-

- (a) Cantharidin
- (b) Hirudin
- (c) Tannic acid
- (d) Carminic acid

90. The sweet taste and odour of fennel is due to:-

- (a) Anethole
- (b) Fenchone
- (c) Eugenol
- (d) Phellandrene

91. Catechu is used in medicine as an:-

- (a) Antidiabetic
- (b) Anti cancer
- (c) Antipyretic
- (d) Astringent

92. Tropane alkaloids are biosynthesized from \_\_\_\_\_ amino acid.

- (a) Phenylalanine
- (b) Tyrosine
- (c) Ornithine
- (d) Leucine

93. One mg of Lycopodium contains an average of:-

- (a) 97000 spores
- (b) 96000 spores
- (c) 95000 spores
- (d) 94000 spores

94. Charaka, a physician belonged to which system of medicine?

- (a) Ayurveda
- (b) Unani
- (c) Siddha
- (d) Homeopathy

95. The CCCN code indicating the botanical drugs is:-

- (a) 2211
- (b) 1122
- (c) 1211
- (d) 1311

96. Uncaria gambir belongs to the family:-

- (a) Rubiaceae

- (b) Combretaceae
- (c) Punicaceae
- (d) Rosaceae

97. *Alkanna tinctoria* (Boraginaceae) roots are used in:-

- (a) Dandruff
- (b) Tooth paste
- (c) Facial cleansing wash
- (d) Lipstick formulations and hair dyes

98. Identify the clotting factor which is known as Stuart factor or thrombokinase.

- (a) Clotting factor - IV
- (b) Clotting factor - VIII
- (c) Clotting factor - X
- (d) Clotting factor - XII

99. Which part of the eye is light sensitive (photosensitive)?

- (a) Iris
- (b) Sclera
- (c) Lens
- (d) Retina

100. Identify the specific site where maturation of sperm takes place.

- (a) Spermatic cord
- (b) Epididymis
- (c) Testis
- (d) Vas deference

101. Identify the hormone that stimulates sperm production in testes and ovulation in females.

- (a) Prolactin
- (b) Luteinising hormone
- (c) Follicle stimulating hormone
- (d) Adrenocorticotropic hormone

102. Identify the correct pair from the following:-

- (a) Sympathetic stimulation: Bronchoconstriction
- (b) Parasympathetic stimulation: Secretion of gastric juice
- (c) Sympathetic stimulation: Contraction of pupil
- (d) Parasympathetic stimulation: Dilatation of pupil

103. The number of subjects required in a phase 1 clinical trial is:-

- (a) 20 to 100
- (b) Upto several hundred
- (c) 300 to 3,000
- (d) Several thousands

104. To obtain a more effective bronchodilation, the drugs that are combined along with beta-adrenoceptor agonists are:-

- (a) Cholinergic antagonists
- (b) Cholinergic agonists
- (c) Beta-adrenoceptor antagonists
- (d) Alpha-adrenoceptor antagonists

105. Which of the following antipsychotic drugs, at low doses, is combined with antidepressants in treatment-resistant depression?

- (a) Chlorpromazine
- (b) Haloperidol
- (c) Risperidone
- (d) Fluphenazine

106. The management of Type-B adverse drug reaction is:-

- (a) To reduce the dose
- (b) To withhold the dose and avoid in future
- (c) To increase the dose
- (d) To reintroduce and withdraw slowly

107. Abatacept, a fusion protein, and a co-stimulation blocker used in the treatment of Rheumatoid arthritis blocks the:-

- (a) Activation of T-cells
- (b) Inhibition of T-cells
- (c) Activation of B-cells
- (d) Inhibition of B-cells

108. Hemophilia A is a disease characterized by deficiency of:-

- (a) Factor VIII
- (b) Factor II
- (c) Factor VII
- (d) Factor V

109. The enzyme HMG-CoA reductase is involved in the pathogenesis of:-

- (a) Atherosclerosis
- (b) Renal failure
- (c) Alzheimer disease
- (d) Parkinson disease

110. Rheumatic heart disease is caused by:-

- (a) Streptococcal infection
- (b) Excessive lipid consumption
- (c) Abnormal lipid metabolism
- (d) Atherosclerosis

111. Which of the following is NOT a gene associated with breast cancer?

- (a) BRCA1
- (b) HER2
- (c) BRCA2
- (d) CHRM1

112. Which of the following is NOT true about the Ebola Virus Disease(EVD)?

- (a) Spreads through human-to-human transmission via direct contact
- (b) Antiviral drugs are approved by FDA to mitigate the infection
- (c) Diagnostic tests include ELISA
- (d) The virus is named after a river

113. Hypodermoclysis refers to which route of drug administration?

- (a) Sublingual
- (b) Intradermal
- (c) Subcutaneous
- (d) Intravenous

114. Which of the following is a shortest acting cholinesterase inhibitors enlisted below?

- (a) Neostigmine
- (b) Pyridostigmine
- (c) Edrophonium
- (d) Physostigmine

115. Which of the following is a suitable antidote for mercury poisoning?

- (a) Atropine
- (b) Dimercaprol
- (c) Naloxone



(d) Nalorphine

116. Histamine concentration is highest in:-

- (a) Beta cells
- (b) Mast cells
- (c) Lymphocytes
- (d) Adipocytes

117. Select the  $\beta$ -lactamase inhibitor.

- (a) Griseofulvin
- (b) Clavulanic acid
- (c) Sulfamethoxazole
- (d) Tetracycline

118. The mechanism of action of ciprofloxacin is:-

- (a) Inhibition of protein synthesis by interacting with 30s ribosome
- (b) Inhibition of protein synthesis by interacting with 50s ribosomes
- (c) Inhibition of DNA synthesis by interacting with topoisomerase
- (d) Inhibition of cell wall synthesis

119. Which of the following is NOT CORRECT for myasthenia gravis?

- (a) Down regulation of nicotinic receptors (Nm) leads to myasthenia gravis
- (b) Tubocurarine is used to treat myasthenia gravis
- (c) It is an autoimmune disorder
- (d) Thymectomy is treatment option for myasthenia gravis

120. Which of the following describes the effect of Sodium cromoglycate?

- (a) Mast cell degranulation
- (b) Mast cell stabilization
- (c) Leukotriene antagonism
- (d) Glucocorticoid receptor agonism

121. Which of the following side effect of ACE inhibitors result from inhibition of bradykinin breakdown?

- (a) Analgesia
- (b) Hyperglycaemia
- (c) Productive cough
- (d) Dry cough

122. Identify antihistamine drug with additional serotonin receptor blocking activity and good

appetite

stimulant property.

- (a) Cyproheptadine
- (b) Cimetidine
- (c) Ranitidine
- (d) Chlorpheniramine

123. Which of the following are the mechanisms of action of digitalis glycosides?

i. Inhibition of  $\text{Na}^+ - \text{K}^+$  ATPase enzyme. ii. Reduction in the auriculo-ventricular conduction rate.  
iii. Increase in the cardiac output. iv. Acceleration of auriculo-ventricular conduction rate.

- (a) Only iii
- (b) i, ii and iii
- (c) ii, iii and iv
- (d) Only i

124. The following is NOT true for Furosemide:-

- (a) Causes hypokalemia
- (b) Causes hypouricemia
- (c) Causes hypomagnesemia
- (d) Acts by inhibiting sodium reabsorption

125. Which of the following about the Varicella-Zoster Virus (VZV) is NOT true?

- (a) Varicella develops after an individual is exposed to VZV for the first time
- (b) Herpes zoster develops from reactivation of the virus later in life
- (c) There are no vaccines for this virus
- (d) The infection results in post-herpetic neuralgia

ANSWER KEY GPAT 2018

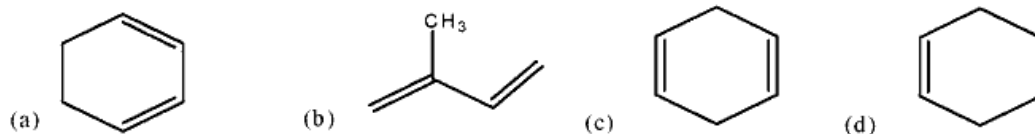
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11-c	12-b	13-b	14-a	15-c	16-b	17-a	18-a	19-c
21-c	22-d	23-d	24-b	25-b	26-d	27-a	28-a	29-d
31-c	32-c	33-a	34-c	35-a	36-a	37-c	38-c	39-d
41-d	42-a	43-b	44-b	45-a	46-b	47-b	48-d	49-a
51-d	52-c	53-b	54-c	55-d	56-a	57-b	58-b	59-c
61-b	62-d	63-b	64-c	65-c	66-c	67-d	68-a	69-b
71-d	72-b	73-d	74-d	75-b	76-a	77-d	78-b	79-c
81-c	82-c	83-a	84-a	85-d	86-a	87-b	88-c	89-d
91-d	92-c	93-d	94-a	95-c	96-a	97-d	98-c	99-d
101-c	102-b	103-a	104-a	105-c	106-b	107-a	108-a	109-a
111-d	112-b	113-c	114-c	115-b	116-b	117-b	118-c	119-b
121-d	122-a	123-b	124-b	125-c				

# GPAT QUESTION PAPER 2017 WITH ANSWER KEY

1. In a free radical reaction, free radicals are formed at

- (a) Initiation step                      (b) Propagation step  
(c) Termination step                  (d) Both (a) and (b)

2. Which of the following dienes can undergo Diels-Alder reaction most readily



3. Separating techniques such as gas chromatography and liquid chromatography are not appropriate for separation of amino acids. Select correct reason from the following

- (a) Amino acids high polarity substances  
(b) Amino acids are low polarity substances  
(c) Amino acids are non polar substances  
(d) Amino acids lowly charges substances

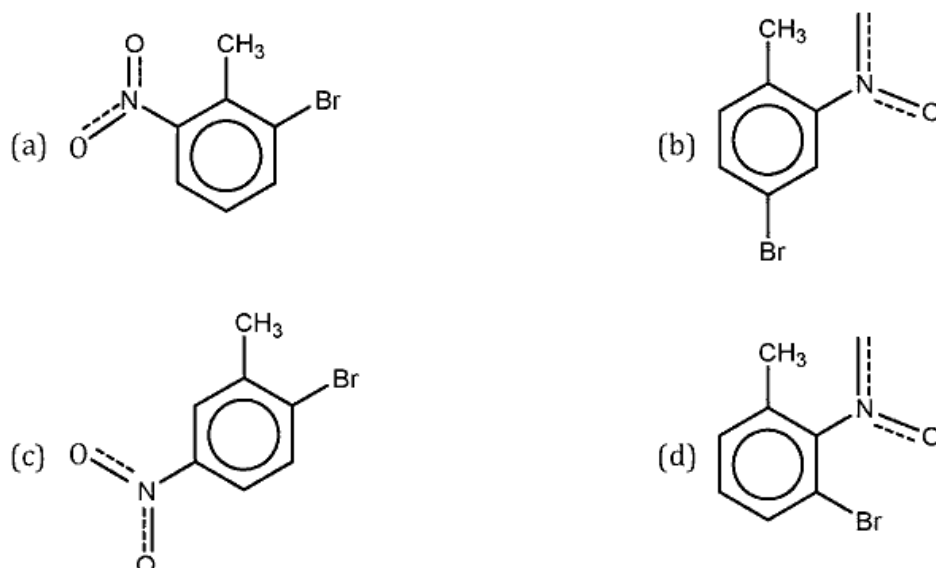
4. When trans-2-butene is treated with bromine an anti-addition of bromine yields meso-2,3-dibromobutane. Select the correct statement regarding the reaction from the following

- (a) The reaction is stereoselective as well as stereo specific  
(b) The reaction is stereoselective and not stereo specific  
(c) The reaction is nonstereoselective as well as non stereo specific  
(d) The reaction is stereo specific and not stereo selection

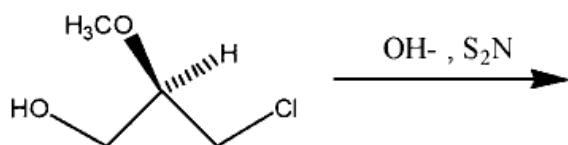
5. Reduction of imines to give amines in protic solvents can be carried out by one of the following reagents. Select the correct reagent

- (a) Sodium hydride  
(b) Sodium chloride and HCl  
(c) Lithium aluminium chloride  
(d) Sodium cyanoborohydride

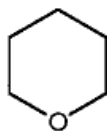
6. In the reaction of 2-nitrotoluene with bromine in presence of iron, which of the product shown below is the most abundant (major) product



7. Which of the following cannot react as a nucleophile
- (a)  $(\text{CH}_3)_4\text{N}^+$  (b)  $\text{CH}_3\text{NH}_2$   
 (c)  $(\text{CH}_3)_2\text{NH}$  (d)  $(\text{CH}_3)_3\text{N}$
8. Which of the following compounds will be oxidized by  $\text{CrO}_3$  in acid
- (a) 4-Methylcyclohexene (b) 3-Methyl 3-hydroxycyclohexanone  
 (c) 4,4-Dimethyl-1-methyl-1,3-cyclohexandiol (d) 2-Methylcyclohexanone
9. Which of the following compounds absorbs at the longest wavelength
- (a) 1,3,5-Hexatriene (b) 1,3,5,7-Octatetraene  
 (c) 1,7-Diphenyl-1,3,5-heptatriene (d) 1,6-Diphenyl-1,3,5-heptatriene
10. Which of the following reagents will reduce a disubstituted alkyne to trans-alkene
- (a) Na and  $\text{NH}_3$  (b)  $\text{LiAlH}_4$   
 (c)  $\text{B}_2\text{H}_6$  (d) Pd and  $\text{H}_2$
11. Which of the following statement is true about following reaction



- (a) The product will not have a stereo center (b) The product will have R configuration  
 (c) The product will not have S configuration (d) The reaction will happen with racemisation
12. Which functional group is present in the molecule shown below



- (a) Amide (b) Alcohol (c) Ester (d) Ether
13. Match the following agents that cause cancer with the preferable sites for where it might cause
1. Arsenic (a) Prostate  
 2. Benzene (b) Angiosarcoma  
 3. Cadmium Compounds (c) Leukemia  
 4. Vinyl chloride (d) Hemangiosarcoma
- (a) 1 - d; 2 - c; 3 - a; 4 - b (b) 1 - b; 2 - a; 3 - c; 4 - d  
 (c) 1 - c; 2 - d; 3 - b; 4 - a (d) 1 - a; 2 - b; 3 - d; 4 - c
14. If the  $\text{pK}_a$  of lidocaine is 7.9 and pH of the infected tissue is 8.9, the fraction of drug in the ionized form will be
- (a) 10% (b) 1% (c) 90% (d) 99%
15. Which among the following are the salient features of Glucocorticoids
- (a) Gets combined with highly specific cytosolic glucocorticoids  
 (b) They promote phagocytosis by macrophages

- (c) Releases of lytic enzymes  
 (d) Increases lipid eicosanoids and prostaglandin gene
16. The most commonly used test of sensitivity to antimicrobial agent is  
 (a) Kirby- Bauer techniques (b) Immunodiffusion techniques  
 (c) Qudin procedure (d) Ouchter- Ion procedure
17. Bulk product is defined as  
 (a) Product completing all processing stages but not necessarily final packing  
 (b) A product ready for final dispatch  
 (c) Raw material used for making final dosage form  
 (d) A defined quantity of raw material from the same batch
18. Product,.....and Promotion are four 'P's of marketing  
 (a) Price and Place (b) Place  
 (c) Process (d) Production, Process, Price, Production
19. Insulin and thyroxin arrive at an organ / tissue / cell at the same time. Thyroxine causes an effect on the organ but insulin does not because  
 (a) The organ cell have receptors for thyroxine but not for insulin  
 (b) Thyroxin is a lipid -soluble hormone and insulin  
 (c) The target cell in the organ have up-regulated for  
 (d) Thyroxin is local hormone and insulin is a circula
20. Which among the following is an incorrect statement with regard to the drug Dantrolene  
 (a) It is a pyrazoline derivative (b) It is an imidazoline analogue  
 (c)It is a nitrophenylfurfurylidene derivative (d)It is a skeletal muscle relaxant
21. Diazepam is not suitable for peroral sustained release form since  
 (a) Is not absorbed in lower intestine  
 (b) It has biological half life greater than twelve effects hour  
 (c) It has biological half life less than one hour  
 (d) It has undesirable side effects
22. Antioxidant used as blocking agent in sterile product is  
 (a) Ascorbic acid esters (b) Sodium bisulphate  
 (c) Ascorbic acid (d) EDTA
23. Many mediators have been implicated in the asthmatic response. The clinical efficacyof pharmacologic intervention with inhibitors or antagonist of the mediators involves following category - except  
 (a) Platelet activating factors (b) Anticholinergics  
 (c) Antihistaminics (d) Cytokine inhibitors
24. Match the following adrenergic drugs with their receptor affinity  
 (1) Epinephrine (a) More alpha 1, no beta 1, beta 2 & dopamine  
 (2) Noradrenaline (b) More alpha 1 & beta 1, less beta 2, no dopamine  
 (3) Phenylephrine (c) More beta 1 & Beta 2, no alpha 1 and dopamine  
 (4) Dobutamine (d) More alpha 1 & beta 1 , no beta 2 & dopamine









41. Naphazoline
- (a) Is used for relief of nasal congestion
  - (b) Exhibits peripheral beta-adrenoceptor stimulant
  - (c) Is a pyrazoline derivative
  - (d) Chemically, is 1H Imidazole, 3,4 -dihydro- 2 -(3-naphthylmethyl) monohydrochloride
42. A patient receiving warfarin develops rheumatoid arthritis. Which one of the following drugs would be Contraindicated
- (a) Ibuprofen            (b) Tolmetin            (c) Aurothioglucose            (d) Aspirin
43. A crude drug powder was heated with ferric chloride, water and concentrated hydrochloric acid followed by extraction with chloroform. The chloroform layer was treated with ammonia, the ammonical layer turned pink. The test indicates presence of \_\_\_\_\_ phytoconstituent
- (a) Anthraquinone-C-glycosides            (b) Flavanones
  - (c) Cardiac glycosides            (d) Saponin glycosides
44. The first vaccine was discovered by
- (a) DeBary            (b) Paul Ehrlich            (c) Robert Koch            (d) Edward Jenner
45. Type IV dissolution apparatus as per USP is
- (a) Flow through cell            (b) Paddle type apparatus
  - (c) Reciprocating cylinder            (d) Paddle over disk apparatus
46. Hoeppler viscometer is a type of
- (a) Falling sphere viscometer            (b) Capillary viscometer
  - (c) Cup and Bob viscometer            (d) Cone and plate viscometer
47. Following are the list of various inherited metabolic disorders that can affect functioning of liver
- a. Primary biliary cirrhosis
  - b. Glycogen storage disease
  - c. Gilbert's syndrome
  - d. Haemochromatosis
  - e. Wilson's disease
- (a) a, b, c, d            (b) b, c, d, e            (c) a, c, d, e            (d) a, b, d, e
48. In relation to buccal and sublingual route of administration which of the following statement is incorrect
- (a) Absorption through epithelium is not affected by partition coefficient of the Drug
  - (b) Drug absorption by these routes by pass first pass metabolism
  - (c) There is an optimum log P for sublingual absorption

- (d) These are preferred routes for anti-anginal drug
49. Which among the following statements describing surface activity for surfactants is incorrect
- Increase in length of hydrocarbon chain decreases surface activity
  - Increase in ethylene oxide chain of polyoxy ethyl alcohol Increase in surface activity
  - Increase in surface activity results in decrease length of hydrocarbon chain
  - Relationship between hydrocarbon chain length and hydrophobicity
50. Surface tension is categorized as a/an \_\_\_\_\_ factor
- Capacity
  - Intensive
  - Extensive
  - Tolerance
51. Which of the following gums is obtained from endosperm
- Guar gum
  - Acacia gum
  - Tragacanth gum
  - Sterculia gum
52. High lightening differences among brands within the same product category is \_\_\_\_\_
- Product brand
  - Brand launch
  - Product differentiation
  - Branding
53. Hot stage microscopy is an important tool in preformulation studies for the study of
- Pseudopolymorphism
  - Particle size measurement
  - Microbial contamination
  - Compaction behaviour
54. In Bismuth subgallate suppositories B.P.C, when no strength of the drug is specified, B.P.C directs \_\_\_\_\_ bismuth subgallate per suppository
- 300 mg
  - 200 mg
  - 100 mg
  - 400 mg
55. The Michaelis-Menten hypothesis
- Postulates the formation of an enzyme-substrate complex
  - Enables us to calculate the isoelectric point of an enzyme
  - States that the rate of a chemical reaction may be independent of substrate concentration
  - States that the reaction rate is proportional to substrate concentration
56. The largest gene in human is \_\_\_\_\_
- Dystrophin
  - Titin
  - Insulin
  - Phosphofructokinase
57. Which of the following techniques is not useful to detect polymorphs
- DSC
  - HPLC
  - PXRD
  - Melting point determination
58. Which of the following constituents is responsible for colour of shellac
- Shellic acid
  - Laccaic acid
  - Aleurotic acid
  - All of the above
59. Match the following drugs with alteration they produce in structural-functional of kidney
- Aminoglycoside Antibiotics (A) Glomerular abnormality
  - ACE inhibitors (B) Tubular epithelial cell Damage

- (3) Methotrxate (C) Hemodynamic Mediated kidney injury  
 (4) NSAIDs (D) Obstructure nephrophathy  
 (a) 1 - B; 2 -C ; 3 - D; 4 -A (b) 1 - A; 2-B; 3 - C; 4- D  
 (c) 1 - C; 2-D; 3 - A; 4- B (d) 1 - D; 2-A; 3 - B; 4- C
60. Hixon Crowell's cube root law of dissolution states that  
 (a) There is a change in particle size and surface area during dissolution of drug  
 (b) Dissolution process is controlled by diffusion of molecules/ions  
 (c) High free energy of activation is required for solution  
 (d) Renewal of surface fluid layer around drug particle
61. All of the following statements regarding estrogen therapy in postmenopausal women are true EXCEPT  
 (a) It restores the loss of bone mass due to osteoporosis  
 (b) It may be useful to treat vasomotor symptoms  
 (c) Administration in a regimen including a progestin  
 (d) It is useful in the treatment of atrophic vaginitis
62. Chapter IV of which law states that experiments on animals are avoided wherever it is possible to do so; as for example; in medical schools, hospitals, colleges and the like, if other teaching devices such as books, models, films and the like, may equally suffice. Also, that experiments on larger animals are avoided when it is possible to achieve the same results by experiments upon small laboratory animals like guinea- pigs, rabbits, frogs and rats  
 (a) The prevention of cruelty to animal act,1960  
 (b) The Pharmacy Act, 1948  
 (c) Drugs and Cosmetics Act, 1940  
 (d) Medicinal and Toilet Preparations Act, 1955
63. Which among the following rules about spin - spin coupling and bond multiplicities are correct with regard to NMR spectra  
 (a) Coupling constant rarely exceeds 20 cps while chemical shifts are over 1000 cps  
 (b) Spin - Spin interactions are dependent of strength of the applied field  
 (c) Coupling constants increase with distance  
 (d) Equivalent nuclei interact with each other to show interaction
64. Most accepted mechanism for developing bacterial resistance to sulphonamides is  
 (a) An alternative metabolic pathway for synthesis of essential  
 (b) An increasing capacity to metabolize the drug

- (c) Increased antagonism of drug  
 (d) An alteration in enzyme that utilizes PABA
65. All the dopaminergic agonists having affinity for D2 receptors are clinically used in following conditions except  
 (a) Obsessive-compulsive disorder  
 (b) Hyperprolactinemia  
 (c) Acromegaly  
 (d) Parkinsonism
66. The labelling instruction "To be diluted 20 times its volume with water" indicates the dispensed product is a  
 (a) Mixture (b) Elixir (c) Linctus (d) Mouthwash
67. Which among the following is a structural variant of GABA and is used as a muscle relaxant  
 (a) Metocurine (b) Tybamate (c) Baclofen (d) Cyclobenzaprine
68. A steroidal phyto constituent lowering blood sugar is obtained from  
 (a) *Momordica charantia* (b) *Quillaja saponaria*  
 (c) *Dioscorea deltoidea* (d) *Glycyrrhiza glabra*
69. Which of the following drug is associated with the reaction of extreme photosensitivity  
 (a) Niacin (b) Digitalis (c) Tetracycline (d) Fluoroquinolones
70. Which among the following statements related to Ceric sulphate as oxidizing agent, as titrant are correct  
 (a) Ce (IV) during reaction exists as an anionic complex in media of sulphuric acid  
 (b) Ionic equation is  $Ce^{3+} \rightarrow Ce^{2+} + e^{-}$   
 (c) Formal potential of Ce(III) Ce (II) couple is 1  
 (d) Ce (IV) does not permit use of HCl as reducing media
71. A labeled piece of DNA that is complementary to the sequence of DNA you are interested in, say the gene you are trying to put into cells, is called as  
 (a) A probe (b) A receptor (c) A epitope (d) A target
72. As per first schedule of Drugs and Cosmetics Act, 1940, following is name of the book under Siddha system of medicine  
 (a) Arka Prakasha (b) Yog Ratnakar (c) Nagamuni (d) Vrinda Chikitsa
73. Amantidine is helpful in Parkinson's disease because  
 (a) It liberates dopamine from nerve endings (b) It decreases cholinergic activity  
 (c) It is metabolized into dopamine (d) It increases adrenergic activity

74. An intermediate 3-Chloroaniline 4,6-disulphonamide on heating with formic acid yields a compound
- 6-chloro-2H-1,2,4-benzothiadiazine-7-sulphonamide
  - 3-chloro-2H-1,2,4-benzothiadiazine-7-sulphonamide
  - Used in treatment of urinary tract infections
  - Used as antibacterial
75. Acetyl Choline is hydrolyzed by enzyme
- Acetylase
  - Cholinase
  - Acetylcholinesterase
  - Transferase
76. Rubella virus is associated with disease
- Progressive encephalitis
  - Enterovirus infection
  - Yellow fever
  - Brucellosis
77. Which among the following electronic systems are not involved in the origin of UV spectrum
- s and p shell electrons
  - sigma and pi electrons
  - Charge transfer electrons
  - d and f shell electrons
78. Which of the following is not a thermoplastic resin
- Phenolic plastic resin
  - Polystyrene
  - Polyethylene
  - Polypropylene
79. Choose the right combination from the following
- |  |               |
|--|---------------|
| (1) Diacytic stomata and sessile Trichome                          | (A) Datuar    |
| (2) Paracytic stomata and Unicellular and multi cellular           | (B) Vasaka    |
| (3) Anomocytic stomata and Unicellular and multi cellular Trichome | (C) Senna     |
| (4) Anisocytic stomata and Multicellular covering trichome         | (D) Digitalis |
- 1-B, 2-C, 3-D, 4-A
  - 1-C, 2-D, 3-A, 4-B
  - 1-A, 2-D, 3-B, 4-C
  - 1-D, 2-B, 3-A, 4-C
80. Pharmaceutical alternatives possess
- Identical therapeutic moiety/precursor but not in the same amount/dosage form
  - Same amount of therapeutic moiety
  - Same dosage form
  - Same formulation ingredients in exactly same amount of dose
81. Topical application of timolol to the eye would be expected to induce which of the following
- Decreased formation of aqueous humor
  - Miosis
  - Mydriasis
  - Increased outflow of aqueous humor



82. The major component of liquid glucose is .....and is prepared from \_\_\_\_\_  
 (a) Maltose, Pectin      (b) Dextrin, Starch      (c) Dextrose, Starch      (d) Glucose, Starch
83. Which of the following formulations under ASU system are offered infinite period of shelf life in D and C Act  
 (a) Asava&Arishta      (b) Churna      (c) Ghutika      (d) Kwatha
84. Which of the following is an example of hemiesters anionic surfactant for pharmaceutical emulsions  
 (a) Sulfosuccinates      (b) Sarcosinates      (c) Taurates      (d) Lactylates
85. The major differences between the prokaryotic and eukaryotic protein synthesis mechanisms are in which part of the process  
 (a) The initiation of synthesis      (b) The chain elongation process  
 (c) The chain termination process      (d) None of the above
86. In DNA replication the newly added nucleotide is joined to the growing DNA strand by an enzyme  
 (a) DNA polymerase      (b) DNA ligase  
 (c) Restriction endonuclease      (d) Reverse transcriptase
87. Glycosides are condensation products of  
 (a) Protein + aglycone      (b) Sugar + Protein  
 (c) Sugar + aglycone      (d) Fats + aglycone
88. Which of the following dosage form of digoxin will provide greater bioavailability based on value of F  
 (a) F equals 1.0      (b) F equals 0.32      (c) F equals 0.62      (d) F equals 0.77
89. The process by which the formed elements of blood develop is call as hemopoiesis. In the process of hemopoiesis the stem cells are converted in to myeloid stem cell and subsequently differentiated and are developed into precursor cells. Match the following precursor cells with the formed elements of blood from which they are formed.
- |                    |                  |
|--------------------|------------------|
| (1) Reticulocyte   | (A) Platelets    |
| (2) Megakaryoblast | (B) Macrophages  |
| (3) Myeloblast     | (C) Erythrocytes |
| (4) Monoblast      | (D) Neutrophils  |
- (a) 1-C, 2-A, 3-D, 4-B      (b) 1-A, 2-C, 3-B, 4-D  
 (c) 1-B, 2-D, 3-C, 4-A      (d) 1-D, 2-B, 3-A, 4-C
90. Using Young's rule, calculate the dose for a 5 year old child if the adult dose is 340mg  
 (a) 200 mg      (b) 100 mg      (c) 400 mg      (d) 800 mg
91. Which among the following statements on electro analytical methods are correct  
 (a) Measures conductance between two electrodes with AC powered Wheatstone bridge  
 (b) Polarography involves plotting of conductance – voltage

- (c) Potentiometry involves application of Ilkovic equation  
 (d) Coulometry involving application of Nernst law relating equivalence between quantity of electricity passed and amount of compound generated at electrodes
92. Chemical interferences are common than spectral interferences due to  
 (a) Formation of compounds of low volatility (b) Ionization in flames  
 (c) Increase in rate of atomization (d) No shift in ionization equilibrium
93. Phase 0 studies means  
 (a) In vitro studies  
 (b) Part of phase I studies of clinical trials  
 (c) First in human microdosing studies  
 (d) Studies carried out on small number of animals
94. Condensation product of Ethyl isopentyl ester of diethyl malonic acid with urea and sodium ethoxide yields  
 (a) Amylobarbitone (b) Phenobarbitone  
 (c) Pentobarbitone (d) Quinobarbitone
95. Clavulanic acid is  
 (a) Inactivates bacterial - lactamase (b) Protein inhibitor of peptidoglycan synthesis  
 (c) Specific for gram negative bacteria (d) Inhibitor of 50S ribosomal subunit
96. The method by which different constituents of a liquid mixture can be separated without decomposition of the constituents is  
 (a) Distillation under reduced pressure (b) Molecular distillation  
 (c) Steam distillation (d) Fractional distillation
97. The preferred rheological behavior of Pharmaceutical suspensions is that of  
 (a) Pseudoplasticity and thixotrophy (b) Pseudoplasticity  
 (c) Dilatancy and thixotrophy (d) Pseudoplasticity and rheopexy,
98. An inventory turnover of ..... a year is considered satisfactory  
 (a) Four to six times, Six (b) To eight times  
 (c) One to two times (d) None of the above
99. The number of glucopyranose units in the structure of alpha cyclodextrins are  
 (a) 8 (b) 9 (c) 7 (d) 6
100. The compound 2 - (Diethylamino) ethyl [bicyclohexyl] - 1-carboxylate hydrochloride is  
 (a) Dicycloverine (b) Diphenhydramine  
 (c) Both nicotinic and specific antispasmodic, (d) Diagonistic agent for diagnosis of thyroid gland,

101. In new product development process, after analysis of business next step to be taken is \_\_\_\_\_
- (a) Test marketing                      (b) Penetration marketing  
(c) Brand marketing                      (d) Individual marketing
102. Which of the following alkaloid (form) is used to treat migraine
- (a) Vinca                      (b) Coca                      (c) Ergot                      (d) Belladonna
103. Free flowing powders show a flatter cone and have \_\_\_\_\_
- (a) Smaller angle of repose                      (b) Larger angle of repose,  
(c) Intermediate angle of repose                      (d) None of the above,
104. The WIPO is the specialized agency of the United Nations. It promotes protection of \_\_\_\_\_ throughout the world
- (a) Intellectual properties                      (b) World properties  
(c) Pharmaceutical organizations                      (d) Finance companies
105. Herpesviruses are large encapsulated viruses that have double stranded DNA genome that encodes approximately 70 proteins. It causes acute infection followed by latent infection in which virus persist in noninfectious form with periodic reactivation and shedding of infectious virus. Following are the examples of such herpesvirus –except
- (a) Epstein-Barr Virus                      (b) Herpes simplex  
(c) Varicella Zoster                      (d) Cytomegalovirus
106. A fatty acid not synthesized in human body and has to be supplied in diet is
- (a) Stearic acid                      (b) Oleic acid                      (c) Palmitic acid                      (d) linolenic acid
107. Chemical class of drugs that are susceptible to oxidation are
- (a) Esters                      (b) Lactam                      (c) Sterols                      (d) Carbamates
108. The only analgesic acting centrally is \_\_\_\_\_
- (a) Methadone                      (b) Naloxane                      (c) Tramadol                      (d) Naloxane
109. Neuropathy is adverse effect of
- (a) Isoniazid                      (b) Ethambutol                      (c) Pyrazinamide                      (d) Dapsone
110. As per I.P. if the solubility range of a solute is 30 to 100 parts, it will be
- (a) Soluble                      (b) Freely soluble                      (c) Sparingly soluble                      (d) Slightly soluble
111. SDS is used in PAGE of a mixture of proteins for their efficient separation on the gel SDS, in the experiment is used to \_\_\_\_\_
- (a) Have uniform charge density on the proteins                      (b) Stabilize the proteins  
(c) Decrease the surface tension of buffer                      (d) Solubilize the proteins



112. Indicate which of the following statements is true

- (a) A weakly acidic drug is unionised when pH of the solution is at least 2 pH units below its pKa
- (b) Acidic drugs are nonionized at pH 9
- (c) Acidic drugs are less soluble in alkaline solution
- (d) The higher the pKa of a weak acid, the stronger is acid

113. Dissemination of cancer occurs through one of the following pathways - except

- (a) Migration
- (b) Direct seeding
- (c) Lymphatic spread
- (d) Hematogenous spread

114. Which of the following alkaloids has hypotensive activity

- (a) Emetine
- (b) Quinine
- (c) Reserpine
- (d) Papaverine

115. Which of the following is a characteristic of cytochrome P-450

- (a) Catalyzes aromatic and aliphatic hydroxylations
- (b) Located in the lipophilic environment of mitochondrial membrane
- (c) Catalyzes O-, S-, N methylation reactions
- (d) Catalyzes conjugation reactions

116. The Michaelis-Menten equation for standard for saturated active transport system is-

- (a)  $V_{\max} = k_{\text{cat}}[E_0]$
- (b)  $V_{\max} = k_m$
- (c)  $V_{\max} = k_m[S]$
- (d) None

117. Which among the following describe the characteristic features of Tetracycline

- (a) Undergoes epimerization in solutions having intermediate pH range
- (b) Forms Anhydrotetracycline in presence of acid
- (c) Forms Minocycline in basic medium
- (d) Forms stable chelate complexes with potassium ions

118. Cells that contribute for immune system are

1. T Lymphocytes
2. Eosinophil
3. B Lymphocytes
4. Dendritic cells
5. Erythrocytes
6. Natural killer cells

- (a) 1, 3, 4 and 6
- (b) 1, 2, 4 and 6
- (c) 1, 3, 5 and 6
- (d) 1, 2, 5 and 6

119. Dielectric constant of Ethanol at room temperature is almost equal to

- (a) 24
- (b) 48
- (c) 54
- (d) 72

120. Foaming during liquid filling can be reduced by following ways, except  
 (a) Increase in speed of the filling line (b) Minimised product turbulence  
 (c) Closed system filling (d) Defoaming device
121. If the excitation energy of the resonance level is 2.10 eV (when  $hc=12,330$ ) then the wave-length of resonance line of sodium atoms is \_\_\_\_\_  
 (a) 577.2 nm (b) 587.2 nm (c) 567.2 nm (d) 597.2 nm
122. After vascular injury, platelets encounter extracellular matrix constituents such as collagen and adhesive glycoprotein. On contact with these proteins platelets undergo  
 1. Adhesion  
 2. Secretion  
 3. Aggregation  
 4. Degradation  
 (a) 1, 2 and 3 (b) 1, 2 and 4 (c) 1, 2, 3 and 4 (d) 1, 2 and 4
123. A reporting relationship in which an employee receives orders from, and reports to, only one supervisor is known as \_\_\_\_\_  
 (a) Unity of command (b) Centralisation  
 (c) Decentralisation (d) Line of authority
124. In humans end product of purine catabolism is  
 (a) Uric acid (b) Urea (c) Purine oxide (d) Xanthine
125. Which of the following adverse effects is caused by thioridazine  
 (a) Tardive dyskinesia (b) Constipation  
 (c) Orthostatic hypotension (d) All of the above

### ANSWER KEY GPAT 2017

1-d	2-a	3-a	4-a	5-d	6-b	7-a	8-c	9-d	10-a
11-a	12-d	13-a	14-c	15-a	16-a	17-a	18-a	19-b	20-a
21-b	22-a	23-a	24-a	25-a	26-a	27-a	28-b	29-b	30-a
31-a	32-c	33-a	34-a	35-a	36-b	37-c	38-a	39-c	40-a
41-a	42-d	43-a	44-d	45-a	46-a	47-b	48-a	49-a	50-b
51-a	52-c	53-a	54-c	55-a	56-a	57-b	58-b	59-a	60-a
61-a	62-a	63-a	64-a	65-a	66-d	67-c	68-a	69-c	70-a
71-a	72-c	73-a	74-a	75-c	76-a	77-a	78-a	79-a	80-a
81-a	82-c	83-a	84-a	85-a	86-a	87-c	88-a	89-a	90-b
91-a	92-a	93-c	94-a	95-a	96-b	97-a	98-a	99-d	100-a
101-a	102-c	103-a	104-a	105-a	106-d	107-c	108-a	109-a	110-c
111-a	112-a	113-a	114-c	115-a	116-a	117-a	118-a	119-a	120-a
121-b	122-a	123-a	124-a	125-d					

# GPAT QUESTION PAPER 2016 WITH ANSWER KEY

- What is the Carr's index of good flow powder property  
(a) 5-15 (b) 12-16 (c) 18-21 (d) 28-35
- Which microorganism is involved in the assay of Rifampicin  
(a) Bacillus subtilis (b) Micrococcus luteus (c) Bacillus pumilus (d) Bacillus cereus
- Which percentage of dextrose is isotonic with the blood plasma  
(a) 5% (b) 10% (c) 15% (d) 20%
- What is the biological source of Alexandrian Senna  
(a) Cassia aungustifolia (b) Cassia acutifolia  
(c) Cassia Bravifolia (d) Cassia Nerifolia
- HLB of SPAN and TWEEN surfactants may be obtained from which of the following equations  
(a)  $HLB = E/5$   
(b)  $HLB = (E+P)/5$   
(c)  $HLB = 20 [(1- S)/A]$   
(d)  $HLB = (\text{hydrophilic group numbers}) - (\text{lipophilic group numbers}) + 7$
- If the given drug is absorbed by passive what will be its absorption kinetics  
(a) Zero Order (b) First Order  
(c) Second order (d) Pseudo-zero Order
- Which of the following is delayed type of her sensitivity reaction  
(a) Arthus reaction (b) Penicillin sensitivity  
(c) Tubercullin sensitivity (d) ABO incompatibility
- Which of the following is NOT suitable as a post-coital contraceptive  
(a) Levonorgestrel 1.5mg (b) Ulipristal acetate 30 mg  
(c) Mifepristone 10-25 mg (d) Mestranol 1.5 mg
- Which of the following properties are characteristics of tannis  
(P) They give a precipitate with alkaloids  
(Q) They give a yellow of bluish red color with iron(III) chloride  
(R) They transform hide into leather  
(S) They give a pale-pink precipitate with iodine  
(a) P, Q, S (b) P and Q (c) P and R (d) Only Q
- Adverse drug Event reporting in the responsibility of all of the following EXCEPT  
(a) Pharmacist and physician (b) Manufacturer  
(c) Consumer (d) Regulatory authorities
- Time dependent dilatant behavior is known as  
(a) Thixotrophy (b) Rheopexy (c) Rheomalaxis (d) Plastic
- Chairman of DTAB is:  
(a) Health minister of India (b) Director general of Health services  
(c) Drug controller of India (d) President of AICTE
- Plasmodesmata is:  
(a) Lignified element (b) Vascular element  
(c) Very fine protoplasmic thread (d) None

14. Efficiency of drug is checked in modest population in
- (a) Clinical trail-phase1 (b) Clinical trail-phase2  
(c) Clinical trail-phase3 (d) Clinical trail-phase4
15. Which of the following statements is correct for gram positive bacteria
- (a) Cell wall has a thin peptidoglycan layer  
(b) Cell wall lipid content is very low and smaller volume of periplasm  
(c) Lipopolysaccharide layer is present  
(d) Teichoic acid is present
16. The terms upper consulate temperature and lower consulate temperature are related to which phenomenon
- (a) Cloud point (b) Critical solution temperature  
(c) Kraft point (d) Phase inversion
17. Match the alkaloids with their synthesis precursors.
- (1) Pilocarpine (P) Nucleotide  
(2) Connine (Q) Tryptophan  
(3) Caffeine (R) Histadine  
(4) Yohimbine (S) Acetate derived
- (a) 1-S, 2-R, 3-P, 4-Q (b) 1-S, 2-Q, 3-P, 4-R  
(c) 1-P, 2-R, 3-S, 4-Q (d) 1-R, 2-S, 3-P, 4-Q
18. Which one of the following is a solid dosage form excipient which can play the role of a diluent, a disintegrant, a glidant, a lubricant and a pore/ channel former.
- (a) Lactose (b) Microcrystalline cellulose  
(c) Ethyl cellulose (d) Eudragit RL 100
19. What is the required floor area for running a pharmacy for wholesale or distribution
- (a) 6 sq meters (b) 10 sq meters  
(c) 15 sq meters (d) 30 sq meters
20. Bioavailability differences among drug's oral formulations are most likely to occur if it
- (a) Is freely water soluble (b) Is incompletely absorbed  
(c) Is completely absorbed (d) Undergoes little first-pass metabolism
21. Match the drug with their receptor profiles
- (1) Ergotamine (P) 5-HT<sub>2A</sub> antagonist  
(2) Ondansetron (Q) 5-HT<sub>1</sub> partial agonist /antagonist  
(3) Sumatriptan (R) 5-HT<sub>3</sub> antagonist  
(4) Ketanserin (S) 5-HT<sub>1D</sub> agonist
- (a) 1-R, 2-S, 3-Q, 4-P (b) 1-Q, 2-R, 3-S, 4-P  
(c) 1-R, 2-S, 3-P, 4-Q (d) 1-S, 2-R, 3-P, 4-Q
22. What strategy of drug design is frequently used on complex lead compounds derived from natural products
- (a) Extension (b) Simplification  
(c) Rigidication (d) Conformational block
23. Which type of photon detector is commonly microfabricated into arrays of 500 or More individual detectors
- (a) Photocell (b) Phototube  
(c) Photomultiplier tube (d) Photodiode

24. Which of the following is a phase II drug metabolism reaction associated with genetic polymorphism
- (a) Glucuronidation (b) Acetylation  
(c) Reduction (d) Glutathione conjugation
25. A gram-negative diplococcus associated with urinary tract infection, pelvic inflammatory disease and conjunctivitis, meningitis is
- (a) Neisseria gonorrhoeae (b) Chlamidia Trachomatis  
(c) Hemophilus influenza (d) Streptococcus pneumoniae
26. Pregnancy test kits are designed to detect
- (a) Estrogen (b) Human chorionic gonadotropin  
(c) Follicle-stimulating hormone (d) Luteinizing hormone
27. Drug Z is a depolarizing neuromuscular blocking agent effective for the treatment of pinworm. Identify drug Z
- (a) Pyrantel (b) Paramomycin  
(c) Integrase (d) Protease
28. Methenamine used for UTI is a prodrug. How and to what is it converted into
- (a) At low pH of Urine, to formaldehyde (b) At high pH of urine, to aminosalicic acid  
(c) At low pH of Urine, to aminosalicic acid (d) At high pH of urine, to formaldehyde
29. The correct order for the basic features of a mass spectrometer is
- (a) Acceleration, deflection, detection, ionization (b) Ionization, Acceleration, deflection, detection  
(c) Acceleration, ionization, deflection, detection (d) Acceleration, deflection, ionization, detection
30. Match the following enzymes/protein with specific functions in DNA replication
- (1) Helicases (P) Processive unwinding of DNA  
(2) DNA Primases (Q) Seals the single strand  
(3) DNA ligases (R) Relieves torsional strain  
(4) Topoisomerases (S) Initiates synthesis of RNA Primers
- (a) 1-P, 2-Q, 3-R, 4-S (b) 1-P, 2-S, 3-Q, 4-R  
(c) 1-S, 2-Q, 3-P, 4-R (d) 1-P, 2-Q, 3-R, 4-S
31. Which is the first line drug for the treatment of generalized seizures
- (a) Valproic acid (b) Anhydrotetracycline  
(c) Carbamazepine (d) Doxycycline
32. Tetracycline in basic solution is unstable and forms which product
- (a) Epithetracycline (b) Anhydrotetracycline  
(c) Isotetracycline (d) Doxycycline
33. The location of the blood-brain barrier is considered to be
- (a) At the level of the brain capillaries (b) At the level of glia  
(c) At the level of neurons (d) At the level of dendrites
34. The following drug metabolizing reaction is entirely non-microsomal:
- (a) Glucuronide conjugation (b) Acetylation  
(c) Oxidation (d) Reduction
35. Which of the following methods is used to determine whether a process functions properly for its intended use
- (a) Capacity (b) Inspection  
(c) Validation (d) Design Review



36. Match product, source and plant part from which they are obtained

- |               |                      |            |
|---------------|----------------------|------------|
| (1) Bacosides | (P) Aciacia catechu  | (i) Herb   |
| (2) Cutch     | (P) Rubiaticorium    | (ii) Leaf  |
| (3) Henna     | (R) Bacopamonnieri   | (iii) Root |
| (4) Alizarm   | (S) Lawsoniainternis | (iv) Stem  |
- (a) 1-R-ii, 2-S-I, 3Q-Q-iii, 4-P-iv                      (b) 1-R-I, 2-P-iv, 3-S-ii, 4-Q-i  
(c) 1-Q-ii, 2-P-iii, 3-S-iv, 4-R-I                      (d) 1-S-ii, 2-R-iv, 3-P-I, 4-Q-i

37. What is the significance of term overfill

- (a) It is similar to overage  
(b) It is the excess volume to be field in containers as vials, ampoules to avoid loss by degradation  
(c) It is the excess filing of container as vials, ampoules to avoid the loss during case  
(d) It is violation of packaging regulation as per GMP

38. Identify the false statements

- (a) A characteristics of drugs eliminated by zero order kinetic process is that the half -life is not constrains  
(b) The plasma drug concertation versus time curve for a drug eliminated by zero order kinetics linear  
(c) A fundamental characteristics of all first order pharmacogenetics processes is that the rate of the process is proportional to drug concentration  
(d) A characteristics of absorption by lipid diffusion is its saturability at high drug concentrations

39. 2', 3'-Didehydro-3'-deoxy thymidine is the chemical name of which of following antiviral agents

- (a) Didenosine                      (b) Zidovudine                      (c) Stavudine                      (d) Zalcitabine

40. Oseltamivir is antiviral drug. It produces its action by inhibiting which enzymes

- (a) DNA polymerase                      (b) Neuraminidase  
(c) Praziquantel                      (d) Ivermectin

41. In NMR spectrum, a signal is observed as triplet. What will be the ratio of relative peak areas in this signal

- (a) 1:1:1                      (b) 1:2:1                      (c) 1:3:1                      (d) 1:4:1

42. Which problem can arise if the material to be compressed into tablet tends to adhere to die walls

- (a) Picking                      (b) Sticking                      (c) Capping                      (d) Marbling

43. What is the half life of Tc-99m

- (a) 66 years                      (b) 66 hours                      (c) 6 hours                      (d) 60 minutes

44. Eudragits are

- (a) Phthalate polymers                      (b) Cellulose polymers  
(c) Acrylate polymers                      (d) Amide polymers

45. Drugs (price control ) order 1995 and related orders form time to time are enforced by

- (a) NPPA                      (b) CSIR                      (c) DBT                      (d) ICMR

46. Match the drugs with plant from which they are isolated and their families

- |                                |                      |                     |
|--------------------------------|----------------------|---------------------|
| (1) Artemisinin                | (P) Periwinkle       | (i) Dioscoreaceae   |
| (2) Diosgenin                  | (Q) May apple        | (ii) Apocynaceae    |
| (3) Etoposide                  | (R) Sweet wormwood   | (iii) Berberidaceae |
| (4) Vinblastine and Vicristine | (S) Maxican wild yam | (iv) Asteraceae     |
- (a) 1-R-iv, 2-S-i, 3-Q-iii, 4-P-ii                      (b) 1-s-iv, 2-R-i, 3-Q-iii, 4-P-ii  
(c) 1-Q-iii, 2-R-ii, 3-Q-i, 4-P-iv                      (d) 1-R-iv, 2-S-iii, 3-Q-i, 4-P-ii

47. Which of the following is an irreversible phenomenon related to stability of emulsion
- (a) Cracking (b) Creaming  
(c) Coalescence (d) Flocculation
48. If a drug is highly bound to plasma proteins, what might be its reason or consequence
- (a) It is most likely carried by  $\alpha$ -glycoprotein (b) It has a high renal clearance  
(c) It has a large Vd (d) It is a likely candidate for drug interactions
49. In order to make a generic substitution; a pharmacist must do also act as a hydrogen bond acceptor
- (a) Notify the patient of the substitution  
(b) Charge the same or lower price for the generic  
(c) Place the brand name on the label and write "substitute for"  
(d) Obtain the physician's consent to substitute the product
50. Which of the following groups can form ionic interactions and also act as a hydrogen bond acceptor
- (a) Hydroxyl group (OH) (b) Carboxylate group (RCOO)  
(c) Aminonium group (RNH<sup>3+</sup>) (d) Ketone (C=O)
51. Which of the following drug does not give pink colour with ruthenium red
- (a) Agar (b) Guar gum (c) Pectin (d) Isabgol
52. The IUPAC name, 4-Amino-N(5,6-dimethoxy-4-pyrimidinyl) benzene sulfonamide belong to which generic drug
- (a) Sulfadiazine (b) Sulfadoxine (c) Sulfalene (d) Sulfamerazine
53. Method of inspections used to determine the absorption rate constants. It assumes that
- (P)  $K_a$  is at least five times greater activities  
(Q) Absorption is complete (i.e. > 95% complete) at the time of peak concentration  
(R) Both Absorption and elimination are first order processes
- (a) P and Q (b) Q and R (c) Q and R (d) P and R
54. The clinical trial registry in India is maintained by
- (a) World health organization, Delhi  
(b) Indian council of medical research, New Delhi  
(c) Institute of Clinical Research, New Delhi  
(d) Central drugs standard control Organization, New Delhi
55. What is the correct order for unsaturation in following fatty acids
- (1) Palmitoleic Acid (2) Linolenic  
(3) Linoleic acid (4) Arachidonic acid
- (a) 1>2>3>4 (b) 3>4>2>1 (c) 4>3>2>1 (d) 4>2>3>1
56. Which of the following is an example of Diazonium ion
- (a)  $\text{CH}_3^+\text{N}_3^-$  (b)  $\text{CH}_3\text{N}_2^+$  (c)  $\text{H}_2\text{N}-\text{NH}_3^+$  (d) None of these
57. Which term describes 'The degree to which a set of inherent properties of a product system, of process fulfils requirements, the best'
- (a) Standard (b) Quality (c) Quality objective (d) State of control
58. What will be AUC value of lidocaine if the administered dose is 0.2 g and the total body clearance is 45 L/h
- (a) 4.44 h.mg/L (b) 0.0044 h.mg/L (c) 9.00 h.mg/L (d) 9000 h. mg/L

59. Toluene is converted of which compound in presence of  $\text{CrO}_3$  with acetic anhydride
- (a) Benzyl alcohol (b) Benzaldehyde  
(c) Benzoic acid (d) Benzoin
60. Match the antimalarial drugs with their modes of action
- (1) Artemisinin (P) Inhibition of parasite mitochondrial electron Transport  
(2) Pyremethamine (Q) Inhibition of heme polymerase  
(3) Quinine (R) Generation of oxygen and carbon- centered radicals  
(4) Atovaquone/Proguanil (S) Inhibition of dihydrofolate reductase
- (a) 1-P, 2-S, 3-Q, 4-R (b) 1-Q, 2-S, 3-P, 4-R  
(c) 1-S, 2-R, 3-Q, 4-P (d) 1-R, 2-S, 3-Q, 4-P
61. Methyl ether of erythromycin is .....
- (a) Clarithromycin (b) Dirithromycina  
(c) Azithromycin (d) Mithramycin
62. Ebullioscopic method is based on which of the following observation
- (a) Freezing point depression (b) Boiling point elevation  
(c) Osmotic pressure change (d) None of the above
63. How many fundamental vibrations can be expected for  $\text{C}_2\text{H}_5\text{Cl}$
- (a) 7 (b) 11 (c) 14 (d) 18
64. Which of the antibodies provide passive immunity to newborn baby
- (a) IgG (b) IgM (c) IgA (d) IgE
65. Increased number of number mitosis may be present in the following tissue EXCEPT
- (a) Bone marrow cells (b) Nails (c) Hepatocytes (d) Intestinal Cells
66. To which chemical class the vinca alkaloids belong
- (a) Tropane (b) Indole (c) Tryptophan (d) Purine
67. An antibiotic that resembles the 3' end of a charged tRNA molecule is
- (a) Streptomycin (b) Vincamycin (c) Puromycin (d) Tetracycline
68. If the cohesive forces in between similar molecules are less than the adhesive forces between dissimilar molecules, a deviation in Raolt's law is observed . here witch deviation will be seen.
- (a) Positive (b) Negative  
(c) Absent (d) Either positive or negative
69. Phenylalanine, a precursor of most of the phenolics in higher plants is a product of which one of the following pathways
- (a) Shikimic acid pathway (b) Malonic acid pathway  
(c) Mevalonic acid pathway (d) Methylerythritol pathway



70. Within how many days a pharmacist should dispense diluted aqueous mixtures  
 (a) 7 days (b) 14 days (c) 21 days (d) 30 days
71. What molecular feature is penicillin G is said o mimic  
 (a) Disaccharide of N-acetylmuranicanidN- actylgukosamine  
 (b) N-acetylneuraminic acid  
 (c) The pentapeptide moiety of five glycine units  
 (d) The dipeptide moiety D-ala-D-Ala
72. If a drug is known to be distributed into total body water, how many milligrams are needed to obtain an initial plasma level of 5mg/L in a patient weighting 70 kg  
 (a) 210 (b) 150 (c) 50 (d) 35
73. What does 'pharmacokinetical compartment' mean  
 (a) Part of the body water which is located is the vascular system  
 (b) Total body water  
 (c) Plasma, intracellular fluid, together , anatomical water compartments where drug is absorbed  
 (d) Part of the body water in which the change of a drug concentration has the same kinetics
74. The resistance to macrolide antibiotics by of gram positive organism is developed due to  
 (a) Decreases uptake of antibiotics  
 (b) Synthesis of esterase enzyme that hydrolyzes lactone ring of macrolide  
 (c) Methylation of 50S subunit at the antibiotic binding site  
 (d) Increased metabolism of antibiotic
75. The ethanolic solution contaminated with benzele showed absorbance of 0.69 at 260 nm in a 2 cm cell if the molar absorptivity of benzene in thanolis  $230 \text{ M}^{-1}\text{cm}^{-1}$ , what is the concentration of benzene in the solution  
 (a) 0.003 M (b) 0.0015 M (c) 0.001M (d) 0.015M
76. The most effective agent for treating psychosis would be  
 (a) Buspirone (b) Sertaline  
 (c) Dextroamphetamine (d) Olanzapine
77. TGA is regulatory body of which country  
 (a) Europe (b) Australia (c) Canada (d) UK
78. Which prostaglandins have a keto function at C-9 and a  $\alpha$ - Hydroxyl group at C-11 in prostanic acid backbone  
 (a) PGA (b) PGI (c) PGE (d) PGF
79. When morphine is heated at  $140^{\circ}\text{C}$  under pressure, with strong HCL, it converts pnto:  
 (a) Morphinone (b) Apomorphine  
 (c) Codeine (d) Oxymorphine

80. All of the following are gram-negative rods EXCEPT  
 (a) Clostridium (b) Escherichia (c) Salmonella (d) Shigella
81. The cells which secrete male sex hormone testosterone are:  
 (a) Crypts of Lieberkuhn (b) Escherichia  
 (c) Salmonella (d) Shigella
82. If QA and QC are compared  
 (a) Both are literally the same  
 (b) QA is a higher activity in the management hierarchy  
 (c) QA is a higher activity in the management hierarchy  
 (d) QA is done by the production person and QC is done by analyst
83. Bio availability of drug refers to  
 (P) The ratio of drug excreted unchanged in urine to that excreted as metabolites  
 (Q) Fraction of the drug reaching the target to produce the action  
 (R) The length of time an administered drug is available for action  
 (S) Percentages of administered dose that reaches systemic circulation in the unchanged form  
 (a) Only P (b) Q and R  
 (c) R and S (d) Only S
84. Following intravenous administration, drugs are distributed fastest to  
 (a) The skin, kidney, and brain (b) The liver, kidney, and brain  
 (c) The liver, adipose, and brain (d) The liver, kidney, and adipose
85. Which of the following agents act as hypoglycemic as ATP sensitive potassium channel blocker  
 (a) Mitiglinide (b) Pioglitazone  
 (c) Liraglutide (d) Sitagliptin
86. Carabildide shows strong IR absorption in which of the following range in  $\text{cm}^{-1}$   
 (a) 3200-3600 (b) 1640-1690  
 (c) 1000-1300 (d) 2210-2260
87. Match the drugs with their adverse effects  
 (1) Cyclophosphamide (P) Pulmonary fibrosis  
 (2) Doxorubicin (Q) Nephrotoxicity, ototoxicity  
 (3) Bleomycin (R) Acute hemorrhagic cystitis  
 (4) Cisplatin (S) Cardiotoxicity  
 (a) 1-S, 2-R, 3-P, 4-Q (b) 1-P, 2-Q, 3-S, 4-R  
 (c) 1-P, 2-S, 3-Q, 4-R (d) 1-R, 2-S, 3-P, 4-Q
88. Which one of the following technique is used to determine glass transition temperature  
 (a) X-ray diffractometry (b) Raman spectroscopy  
 (c) Differential scanning calorimetry (d) Atomic force microscopy

89. Match the schedules with the particulars they describe

- |                        |   |
|------------------------|---|
| (1) Schedule T         | (P) Standards for patent or proprietary medicines                 |
| (2) Schedule U         | (Q) Requirements/ guidelines to import &/or manufactures new Drug |
| (3) Schedule V         | (R) GMP practices for Ayurvedic, siddha & Unani medicines         |
| (4) Schedule Y         | (S) Particulars to be shown in the manufacturing records          |
| (a) 1-R, 2-S, 3-Q, 4-P | (b) 1-S, 2-Q, 3-P, 4-R  |
| (c) 1-R, 2-S, 3-P, 4-Q | (d) 1-S, 2-R, 3-P, 4-Q  |

90. Which of the following UV rays cause cancer

- (a) UVA                      (b) UVB                      (c) UVC                      (d) All of the above

91. Which are the types of antibodies involved in hypersensitivity reactions

- (a) LgG and LgD              (b) LgG and LgM              (c) LgD and LgA              (d) LgM and LgD

92. The term used to describe unequal distribution of colour on a tablet is

- (a) Chipping                  (b) Mottling                  (c) Lamination                  (d) Double impress

93. Why acetyl chloride undergoes nucleophilic substitution at a faster rate than methyl acetate

- (a) The ester is more sterically hindered than the acid chloride  
(b) The chloride ion is a better leaving group than methoxide  
(c) The acid chloride is more sterically hindered than the ester  
(d) The methoxide ion is a better leaving group than chloride

94. The key concept of Total Quality Managements (TQM) is

- (a) Total control of all quality related activities  
(b) Commitment of all employees to quality improvement and having team meetings  
(c) Top management's direct involvement  
(d) The Introduction of the ISO 9000 Series

95. A drug of low water solubility when given orally is absorbed up to 90% of the administered dose. The drug belongs to which class according to BCS classification

- (a) Class IV                  (b) Class III                  (c) Class II                  (d) Class I

96. Which of the following is NOT a component of evaporator

- (a) Heat exchange              (b) Vacuum separator              (c) Condenser              (d) Cyclone separator

97. In parkinson's disease, there is a predominant loss of dopaminergic neurons

- (a) Substantia                  (b) Cerebellar                  (c) Cerebral cortex                  (d) Locus ceruleus

98. At equilibrium the receptor occupancy is related to drug concentration by

- (a) Henderson-Hasselbach equation                  (b) Hill- Langmuir equation  
(c) Lineweaver-Burk equation                  (d) Langmuir adsorption isotherm

99. Which method is not suitable to calculate area under the curve

- (a) Least square method
- (b) Weighing and platometry
- (c) Trapezoid rule
- (d) Integration of curve

100. OROS is a technology developed for/as

- (a) Oral release rapid onset system
- (b) Orally rapid disintegrating tablets
- (c) Osmotic controlled oral drug delivery system
- (d) Transdermal drug delivery system

101. Match the events in tablet manufacturing process with the effects found in tables

- |  |                                 |
|--|---------------------------------|
| (1) Rapid drying of coated tablets after coating | (P) Increased distegration time |
| (2) Use to highly viscous solution               | (Q) Weight variation            |
| (3) Improper feed rate form hopper               | (R) Orange peel                 |
| (4) Excessive compression force                  | (S) Blistering                  |
| (a) 1-R, 2-S, 3-Q, 4-P                           | (b) 1-R, 2-S, 3-P, 4-Q          |
| (c) 1-S, 2-R, 3-Q, 4-P                           | (d) 1-R, 2-P, 3-S, 4-Q          |

102. At pH 5, the ratio of the protonated to unprotonated forms of morphine pKa 7 would be

- (a) 1:100
- (b) 1:10
- (c) 10:1
- (d) 100:1

103. What structure is formed if the acyl side chain of penicillin is hydrolysed

- (a) Penicillenic acids
- (b) Penillic acids
- (c) 7-Aminopenicillanic acid
- (d) 6-Aminopenicillanic acid

104. The clinical trial is being conducted with 1500 volunteers which may spans on period of 2 years as per protocol. The clinical trial is in which phase

- (a) Phase 1
- (b) Phase 2
- (c) Phase 3
- (d) Phase 4

105. Which of the following drug has not undergone a clinical trial for its use to decrease intracranial pressure

- (a) Dideoxyinosine
- (b) Zidovudine
- (c) Acetazolamide
- (d) Nicotine

106. Colloidal depression have which type of rheology

- (a) Newtonian
- (b) Pesudoplastic
- (c) Non-Newtonian
- (d) Dilatant

107. Which of the reactive oxygen species is most dangerous to cells

- (a) Singlet oxygen
- (b) Hydroxyl radical
- (c) Superoxide
- (d) Peroxide

108. The Gibb's Phase rule

- (a) Holds only for systems with more than components
- (b) Predicts that a maximum of three phase can exists in one components system
- (c) Does not count phase compositions as intensive variables
- (d) Does not count pressure and temperature as intensive variables

109. Nerve impulse from the cochlea arrive first in which region of the brain

- (a) Auditory cortex
- (b) Thalamus
- (c) Medulla oblongata
- (d) Inferior colliculus

110. The product of a Michael reaction of a ketone enolate to an  $\alpha, \beta$ -unsaturated ketone is ..... And addition reaction occurs in a/an
- (a) 1,5- diketone; 1,4-fashion (b)  $\alpha$ -substituted acetate; 1,2 fashion  
(c)  $\beta$  - hydroxy keto; 1,3 - fashion (d)  $\alpha, \beta$  - keto ester; 1,5 -fashion
111. Which of the following is a drug considered as potassium sparing diuretic
- (a) Trimethine (b) Chlorthiazide (c) Mannitol (d) Furosemide
112. Which of the reagent from the given can be used to protect ketone group
- (a) Acidic methanol (b) Basic methanol (c) Methanol + KCN (d) Phenobarbitone
113. Which of the following drugs causes less inhibition or REM sleep
- (a) Zolpidem (b) Ethanol (c) Lorazepam (d) Phenobarbitone
114. The starting materials for synthesis of sulfamethoxazole are
- (a) 4- Aminobenzene-1-sulfonyl amide + 3-chloro-5-methyl isoxazole  
(b) 4- Aminobenzene-1-sulfonyl amide + 3-amino-5-methyl isoxazole  
(c) 4- Aminobenzene-1-sulfonyl amide + 3-amino-5-methyl isoxazole  
(d) 4- Aminobenzene-1-sulfonyl amide + 5-chloro-5-methyl isoxazole
115. Match the following plant product with their chemical class
- |                     |                                   |
|---------------------|-----------------------------------|
| (1) $\beta$ -amyryn | (P) Alkaloid secondary alcohol    |
| (2) Squalene        | (Q) Alkaloid, phenol              |
| (3) Morphine        | (R) Triterpene, secondary alcohol |
| (4) Ephedrine       | (S) Asyclic triterpene, polyene   |
- (a) 1-R, 2-S, 3-Q, 4-P (b) 1-S, 2-Q, 3-P, 4-R  
(c) 1-P, 2-S, 3-Q, 4-R (d) 1-R, 2-S, 3-P, 4-Q
116. All of the following except one are subject to therapeutic drug monitoring, Which one
- (a) Phenytoin (b) Lithium  
(c) Gentamicin (d) Losartan
117. Thiamine deficiency causes decreased energy production because
- (a) It is required for the process of transamination  
(b) It is a co-factor in oxidative reduction  
(c) It is a co-enzyme for transketolase in pentose phosphate pathway  
(d) It is a co-enzyme for pyruvate dehydrogenase & alpha ketoglutarate dehydrogenase
118. Which of the following drugs are often found in both prescription and over-the-counter nasal decongestants
- (a) Alpha 2 agonists (b) Alpha 1 agonists  
(c) Alpha 1 antagonists (d) Beta 2 agonists
119. What is the surface tension of water at 25°C
- (a) 58 dyne/cm (b) 68 dyne/cm  
(c) 72 dyne/cm (d) 82 dyne/cm



120. Acridine and xanthene rings are related to each other in that.....

- (a) Xanthene is oxygen isoster of acridine (b) Acridine is oxygen isoster of xanthene  
(c) Xanthene is nitrogen isoster of acridine (d) Xanthene is sulfur isoster os acridine

121. Colligative properties depend on.....

- (a) Structural arrangement of atoms within the molecules of solute and solvent  
(b) The number of solute particles is solution  
(c) The physical properties of the solute particles dissolved is solution  
(d) Sum of the corresponding properties of individual atoms or functional group within the molecules

122. In polarography.....current must be blocked

- (a) Residual (b) Migration (c) Diffusion (d) None

123. The propellant commonly used in topical aerosols is

- (a) Trichloromonfluoromethane (b) Trifluromonfluroethane  
(c) Dichlordifluromthane (d) Isopropyl alcohol

124. Which of the following increase systolic and diastolic pressure in normal patient

- (a) Epineherine (b) Norepinephrine  
(c) Tyramine (d) Phenylephrine

125. A large Reynold number is indication of which type of flow

- (a) Smooth and stream line flow (b) Laminar flow  
(c) Steady flow (d) Highly turbulent flow

### ANSWER KEY GPAT 2016

1-b	2-a	3-a	4-b	5-c	6-b	7-c	8-d	9-c	10-d
11-b	12-b	13-c	14-b	15-b	16-b	17-d	18-b	19-c	20-b
21-b	22-b	23-d	24-b	25-a	26-b	27-a	28-a	29-b	30-b
31-a	32-c	33-a	34-b	35-c	36-b	37-c	38-d	39-c	40-b
41-b	42-b	43-c	44-a	45-a	46-a	47-b	48-d	49-a	50-d
51-b	52-b	53-a	54-b	55-d	56-b	57-b	58-a	59-b	60-d
61-a	62-b	63-d	64-c	65-b	66-b	67-c	68-b	69-a	70-b
71-d	72-a	73-d	74-b	75-b	76-d	77-b	78-c	79-b	80-a
81-b	82-b	83-d	84-b	85-a	86-b	87-d	88-c	89-c	90-b
91-b	92-b	93-b	94-c	95-c	96-d	97-a	98-b	99-a	100-c
101-c	102-c	103-d	104-c	105-c	106-c	107-b	108-b	109-c	110-a
111-a	112-a	113-a	114-b	115-a	116-a	117-d	118-b	119-c	120-a
121-b	122-b	123-b	124-c	125-d					

# GPAT QUESTION PAPER 2015 WITH ANSWER KEY

## GPAT QUESTIONS

- Which type of alkaloid is present in Vinca?  
(a) Ergot (b) Tropane (c) Indole (d) Quinoline
- What is the biological source of Alexandrian Senna  
(a) Cassia augustifolia (b) Cassia acutifolia  
(c) Cassia Bravifolia (d) Cassia Nerifolia
- In the following drug find out the Potassium Sparing Diuretics  
(a) Milrinone (b) Thiazide (c) Spironolactone (d) Amiloride
- How the wetting agent act in the suspension  
(a) Increase contact angle between substance and solvent  
(b) Reduce contact angle between substance and solvent  
(c) No change in contact angle between substance and solvent  
(d) None of the above
- Which phase of suspension is reversible phase  
(a) Cracking (b) Creaming (c) Phase Inversion (d) Coalescence
- Which eye infection is also called as 'Pink Eye' infection  
(a) Fungal keratitis (b) Viral keratitis (c) Conjunctivitis (d) Myopia
- Match compounds with the pathway they inhibit  
(1) Vancomycin (P) Folate metabolism  
(2) Rifampin (Q) DNA synthesis  
(3) Puromycin (R) Protein synthesis  
(4) Ciprofloxacin (S) RNA synthesis  
(T) Cell wall synthesis  
(a) 1-T, 2-S, 3-R, 4-Q (b) 1-R, 2-S, 3-T, 4-P (c) 1-Q, 2-R, 3-T, 4-Q (d) 1-T, 2-Q, 3-P, 4-S
- The given reaction is an example of  
(a) Arndt-Eistert homologation (b) Mannich reaction  
(c) Michael addition (d) Chichibabin amination reaction
- What is the 6-methyl derivative of erythromycin  
(a) Azithromycin (b) Roxithromycin (c) Clarithromycin (d) Clindamycin
- In the diagnosis of myasthenia gravis, only one of the following drugs will be used as a drug of choice  
(a) Neostigmine (b) Pyridostigmine (c) Physostigmine (d) Edrophonium
- Methyl [5(propylthio)-1H-benzimidazol-2-yl] carbamate is Geneva name of which of the following drug  
(a) Mebendazole (b) Albendazole (c) Thibendazole (d) Triclabendazole
- Which of the following is oil of fruit pulp  
(a) Arachis oil (b) Castor oil (c) Olive oil (d) Apricot oil

13. What is true about bioavailability
- Amount of unbound drug (Free drug reaching systemic circulation)
  - Amount of bound Drug
  - Amount of metabolite drug
  - Amount of Excreted Drug
14. Polymorphs in pharmaceutical solids are detected by which technique
- MS
  - LC-MS
  - Solid state NMR
  - Coulter counter
15. A series of  $\alpha$  - acylureido penicillin's like azlocillin, mezlocillin, and piperacillin are superior because of
- Reduced acid hydrolysis
  - Increased  $\beta$  - lactmase resistance
  - Improved penetration through the cell envelop
  - Slow rate of metabolism
16. Bacillus subtilis is used in assay of which antibiotics
- Penicillin
  - Cephalosporin
  - Vancomycin
  - Streptomycin
17. Which of the following titrations will always have an equivalence point at a pH > 7.00
- Weak acid with a weak base
  - Strong acid with a weak base
  - Weak acid with a strong base
  - None of the above
18. Inadequate drying during coating of tablet leads to which coating defect
- Chipping
  - Lamination
  - Mottling
  - Lamination
19. Match the crude drug with its biological source
- |                  |                           |
|------------------|---------------------------|
| (1) Pale catechu | (P) Conium nactatum       |
| (2) Clove        | (Q) Cymapsistetragonoloba |
| (3) Gaur bean    | (R) Uncariagambir         |
| (4) Hemlock      | (S) Syzygiumaromaticum    |
- (a) 1-Q, 2-P, 3-S, 4-R      (b) 1-Q, 2-S, 3-R, 4-P      (c) 1-R, 2-S, 3-Q, 4-P      (d) 1-R, 2-S, 3-P, 4-Q
20. Which of the following plot indicates the effects of antagonist on receptors
- Michaelis-Menten plots
  - Line weaver burk Plots
  - Displacement plots
  - Schild plots
21. All of the following statements concerning zero-order degradation are true except
- Its rate is independent of the concentration
  - A plot of con Vs time gives a straight line on reactilinear paper and a slope is a rate constant
  - Its half-life is a changing parameter
  - Its concentration remains unchanged with respectto time
22. The liquefaction time of cocoa butter of hydrogenated vegetable oil based suppositories is
- 30-50 min
  - 30-40 min
  - 11-17 min
  - 3-7 min
23. Which of the following is most likely to undergo lysis
- A cell losing water from its cytoplasm
  - A cell with inact, multilayer peptidoglycan cell wall
  - A cell with disturbed pentaglycine bridges in its cell wall
  - A cell a hydrophilic outermost layer in its cell wall



24. Match the drugs with the disease for which it is prescribed

- |                        |                        |
|------------------------|------------------------|
| (1) Bedaquiline        | (P) Anitdiabetic       |
| (2) Sitagliptin        | (Q) Anitiarrhythmic    |
| (3) Mexilitine         | (R) Antidipressant     |
| (4) Paraoxitine        | (S) Antituberualr      |
| (a) 1-S, 2-P, 3-Q, 4-R | (b) 1-S, 2-P, 3-Q, 4-R |
| (c) 1-Q, 2-P, 3-R, 4-S | (d) 1-R, 2-S, 3-P, 4-Q |

25. Which micro-organism used in hairy root culture

- |                        |                           |
|------------------------|---------------------------|
| (a) Agrobact rhiaogens | (b) A. tumefaciens        |
| (c) N. tabacum         | (d) Solanum chrysotrichum |

26. Delayed disintegration in tablet is a result of

- |                                |                                |
|--------------------------------|--------------------------------|
| (a) Large force of compression | (b) Small force of compression |
| (c) Higher amount of granule   | (d) Low amount of granule      |

27. Match drugs with their receptor that they inhibit

- |                                  |                        |
|----------------------------------|------------------------|
| (1) 5HT <sub>1A</sub> agonist    | (P) Cisapride          |
| (2) 5HT <sub>3</sub> antagonist  | (Q) Ketanserine        |
| (3) 5HT <sub>2A</sub> antagonist | (R) Ondansetron        |
| (4) 5HT <sub>4</sub> agonist     | (S) Bupiron            |
| (a) 1-S, 2-R, 3-Q, 4-P           | (b) 1-R, 2-S, 3-T, 4-P |
| (c) 1-Q, 2-R, 3-T, 4-Q           | (d) 1-T, 2-Q, 3-P, 4-S |

28. Passive immunity in new born babies is due to

- |         |         |         |         |
|---------|---------|---------|---------|
| (a) IgG | (b) IgM | (c) IgE | (d) IgA |
|---------|---------|---------|---------|

29. Upper consolute temperature and lower consolute temperature are related to

- |                |                   |
|----------------|-------------------|
| (a) CMC temp   | (b) Kraft Temp    |
| (c) Cloud temp | (d) Absolute temp |

30. Compact size, low weight mass instrument is:

- |               |                      |
|---------------|----------------------|
| (a) EI-TOF    | (b) MALDI-Quadrapole |
| (c) MALDI-TOF | (d) Ion-Trap         |

31. A Pharmaceutical company plans to market a generic version of a drug produce whose patent has expired has expire (d) Which type of documentation must be submitted to the FDA

- |          |                             |
|----------|-----------------------------|
| (a) IND  | (b) NDA                     |
| (c) ANDA | (d) SNDA & Letter of intent |

32. Which of the following does not produce azeotropic mixture with water

- |              |                 |
|--------------|-----------------|
| (a) Methanol | (b) Ethanol     |
| (c) Propanol | (d) Isopropanol |

33. For a particular drug, the rate of absorption but not the extent of the absorption of GIT, is affected by presence of food in GIT then taking the drug with food will result in
- Smaller area under the plasma drug concentration time curve
  - Smaller maximal plasma drug concentration
  - Smaller time at which the maximal plasma drug concentration occurs
  - Smaller fractional bioavailability and total clearance
34. According to USP Alcohol contains
- 94.9 to 96% Ethanol
  - 94.9 to 96% Methanol
  - 50% Ethanol
  - 50% Methanol
35. What does it mean that a cell is polyploid
- That it contains more than 2 copies of one or a few of its chromosomes
  - That it contains more than 2 copies of a full set of homologous chromosomes
  - That it contains more than 2 copies of its sex chromosome
  - That it contains more than 2 copies of its autosomal chromosomes
36. Amount of dextrose in large volume infusion fluids
- 5% w/v
  - 10% w/v
  - 25% w/v
  - 50% w/v
37. \_\_\_\_\_, Anthelmintics having Immunosuppressant activity.
- Piperazine
  - Levamisole
  - Ivermectin
  - Niclosamide
38. Choose correct statement for PEGylation: <http://www.xamstudy.com>
- Used to enhance In-vivo half-life of smaller Peptides and proteins
  - Avoidance of Reticulo-endothelial (RES) clearance
  - Reduce clearance rate through kidney
  - All
39. Characteristics feature of hemorrhagic dengue fever is
- Reduction in platelet count
  - Reduction in RBC count
  - Reduction in coagulation factors
  - Increased RBC
40. The carbonyl stretching frequency for simple aldehydes, ketones, and carboxylic acids is about  $1710\text{ cm}^{-1}$ , whereas the carbonyl stretching frequency for esters is about .....  $\text{cm}^{-1}$
- 1650
  - 1700
  - 1750
  - 1850
41. Polarographic method of analysis to obtain individual amounts of  $\text{Cu}^{2+}$  and  $\text{Cd}^{2+}$  in a given mixture of the two ions ( $\text{Cu}^{2+}$  and  $\text{Cd}^{2+}$ ) is achieved by measuring their
- Half-wave potentials
  - Migration currents
  - Decomposition potentials
  - Diffusion currents
42. Consider the reaction:  $\text{A} + \text{B} \rightleftharpoons \text{C}$
- The unit of the thermodynamic equilibrium constant for the reaction is
- $\text{mol L}^{-1}$
  - $\text{L mol}^{-1}$
  - $\text{mol}^2 \text{L}^{-2}$
  - Dimensionless

43. \_\_\_\_\_, system does not have orifice to release the drug.
- (a) Elementary Osmotic Pump (b) L-OROS  
(c) Sandwich Osmotic Pump Tablet (d) Controlled Porosity Osmotic Pump Tablet
44. Sanguinarine belongs to the subgroup of:
- (a) Morphinans (b) Benzyl isoquinolines  
(c) Phthalide isoquinolines (d) Benzophenanthrenes
45. Identify the IUPAC of dexamethasone
- (a) 2-Chloro-6 $\alpha$ , 9 $\alpha$ -difluoro-11 $\alpha$ , 17, 21-trihydroxy-16 $\alpha$ -methylpregna-1,4-dien-3, 20-dione  
(b) 9 $\alpha$ -Fluoro-11 $\beta$ , 17 $\alpha$ , 21-trihydroxy-16 $\beta$ -methylpregna-1, 4-diene-3, 20-dione  
(c) 9 $\alpha$ -Fluoro-11 $\beta$ , 17 $\alpha$ , 21-trihydroxy-16 $\beta$ -methylpregna-1, 4-diene-3, 20-dione  
(d) 6 $\alpha$ -Fluoro-11 $\alpha$ , 21-dihydroxy-16 $\alpha$ -methylpregna-1, 4-diene-3. 20-dione
46. Tamoxifen is nonsteroidal drug acting at steroid receptor(s) It produces which type of effects
- (P) Androgen (Q) Antiestrogen  
(R) Antiprogestogen (S) Estrogen
- (a) P and Q (b) Q and S (c) Q and R (d) R and S
47. Which enzymes is used by the HIV to form DNA in the host cell
- (a) Restriction endonuclease (b) DNA-directed polymerase only  
(c) Reverse transcriptase only (d) Both (b) and (c)
48. 'Sparging' is the process where
- (a) Silanol groups react with trimethylsilyl group  
(b) An inert gas is bubbled through the solvent reservoir to remove dissolved gases  
(c) Solvents are mixed together in a fixed ratio  
(d) Column is washed with solvents from nonpolar to polar and reverse
49. Morphine does not cause:
- (a) Constriction of pupil (b) CNS depression  
(c) Respiratory depression (d) Diarrhoea
50. Which of the following is not recommended in patients with renal insufficiency or cardiac dysfunction
- (a) Aloe (b) Bisacodyl (c) Isapghol (d) Magnesium hydroxide
51. Higuchi model is applicable to drug that is..... In the formulation
- (a) Dissolved in formulation (b) Dispersed in formulation  
(c) Chemically bound to carrier in formulation (d) Osmotically controlled in the formulation
52. Which of the following is correct about parenteral nutrition
- (a) Parenteral nutrition solutions are hypertonic solutions and IV fluids are isotonic  
(b) Parenteral nutrition solutions and IV preparations are isotonic solutions  
(c) Parenteral nutrition solutions are hypertonic solutions and IV fluids are isotonic  
(d) Parenteral nutrition solutions can be supplemented with medications

53. Cyclic AMP (cAMP) is an important second messenger in signal transduction pathway(s) Which enzyme catalyzes the generation/accumulation of cAMP after a receptor – ligand interaction
- (a) Protein kinase A (b) cAMP phosphodiesterase  
(c) Guanylyl cyclase (d) Adenylate cyclase
54. Which of the following is not included in immunization programme as per WHO recommendations for all children
- (a) BCG (b) Oral polio (c) Measels (d) Typhoid
55. Match the given condition with appropriate drug used for its treatment
- (1) Pernicious anemia (P) Erythropetin  
(2) Megaloblastic anemia (Q) Oprelvekin  
(3) Anemia associated with chronic renal failure (R) Ratenral Vitamin B<sub>12</sub>  
(4) Thrombocypeniadue to cancer chemotherapy (S) Folic acid
- (a) 1-P, 2-Q, 3-R, 4-S (b) 1-R, 2-S, 3-P, 4-Q (c) 1-R, 2-Q, 3-S, 4-P (d) 1-R, 2-P, 3-S, 4-Q
56. In mammals, The major fat in adipose tissue is:
- (a) Triglyceride (b) Cholesterol  
(c) Sphingophospholipids (d) Phospholipids
57. Polarographic method of analysis to obtain individual amounts of Cu<sup>2+</sup> and Cd<sup>2+</sup> in a given mixture of the two ions (Cu<sup>2+</sup> and Cd<sup>2+</sup>) is achieved by measuring their
- (a) Half-wave potentials (b) Migration currents  
(c) Decomposition potentials (d) Diffusion currents
58. What is the objective of trademark
- (a) To claim exclusive properties of products or services  
(b) To claim innovation of products or services  
(c) To deal with market place of expressive ideas  
(d) To protect consumers from being misled
59. Turbulent flow is exhibited by fluids whose
- (a) Re < 40' (b) Re > 40' (c) Re = 40 (d) All of the above
60. Characteristics of drug-protein binding
- (P) Often parallels drug lipid solubility  
(Q) Drug-plasma albumin binding tends to be relatively nonselective  
(R) Acidic drugs bind to albumin while basic drug bind to glycoproteins  
(S) In rheumatoid arthritis patients, increased alpha1- acidic glycoprotein tends to promote increased lidocaine protein binding
- (a) P and Q (b) P, Q and R (c) P, Q, R and S (d) P and R
61. C=O stretchings are very strong and easily observable bands in IR spectroscopy. However in the IR spectrum of glucose C=O absorption band is not seen. Why
- (a) In glucose, C=O group is not terminal (b) In glucose C=O group is absent  
(c) In glucose, hemiacetal group is present (d) In glucose, hemiketal group is present

62. What is/are use/s of phenol coefficient
- To compare a disinfectant's killing efficacy to that of phenol
  - To determine the dilution at which the disinfectant is to be used
  - To determine the purity of disinfectant
  - All of the above
63. Arrange the following esters as per decreasing order of rate of saponification
- |                               |                               |
|-------------------------------|-------------------------------|
| (I) Ethyl benzoate            | (II) Ethyl p- methoxybenzoate |
| (III) Ethyl p- chlorobenzoate | (IV) Ethyl p-nitrobenzoate    |
- I>II>III>IV
  - IV>III>II>I
  - IV>III>I>II
  - II>IV>I>III
64. Which of the following statements about bentonite are CORRECT
- Glycerin is used to pre-wet the bentonite prior to mixing with water to form its gel
  - Aqueous bentonite suspensions retain their viscosity above pH 6 but are precipitated by acids
  - MgO increase gel formation while alcohol in significant amounts can precipitate bentonite gel
  - Bentonite exhibits rheopexy
- P and Q
  - Q and R
  - P, Q and R
  - P, Q, R and S
65. Acid insoluble ash of a leaf is called as
- Earthy matter & silica
  - Inorganic content
  - Organic Content
  - All of the above
66. Grape fruit juice is P- glycoprotein and CYP40 enzyme inhibitor . if drug X is degraded by proteolytic enzymes, administration of grapefruit juice with X
- Increase bioavailability of X
  - Decrease Bioavailability of X
  - Does not affect bioavailability of X
  - Cause unexpected action of X
67. Tannins give positive test for all of the following EXCEPT
- |                           |                       |
|---------------------------|-----------------------|
| (P) Goldebeater skin test | (Q) Phenazone         |
| (R) Biuret test           | (S) FeCl <sub>3</sub> |
- P and Q
  - Q and R
  - P, Q and R
  - P, Q and S
68. Vigabatrin is a GABA analogue that potentiates action of GABA in the brain because it
- Binds to GABA receptor and acts as agonist
  - Inhibits GABA transaminase
  - Blocks NMDA receptor via the glycine binding site
  - Inhibits neuronal reuptake of GABA from synapses
69. Drug that increases systolic B.P. but reduces diastolic B.P.
- Isoproterenol
  - Epinephrine
  - Nor Epinephrine
  - Propranolol



70. Which of the following are characteristics for colloid mills
- (P) Due to centrifugal forces, the mill undergoes periodical vibratory movement  
(Q) Particles smaller than 1  $\mu\text{m}$  can be obtained with them  
(R) The main types of colloid mills are hammer, turbine and dial mills  
(S) The principle of their operation is based on the abrasion of particles at high speed
- (a) Only P, Q and R are correct (b) Only P and R are correct  
(c) Only Q and S are correct (d) P, Q, R and S are correct
71. Inflammation of soft tissue due to hyaluronidase is called as
- (a) Tendinitis (b) Bursitis  
(c) Cellulitis (d) Cumulative Injury Disorder (CID)
72. The hydroxyl derivative of cymene is called as what
- (P) Thymol (Q) Carvacrol (R) Menthol (S) Cumene  
(a) P, Q, R and S (b) P, Q, and R (c) P and Q (d) Only P
73. Which of the following are the correct properties of ferroin? Ferroin is
- (P) 1, 10-phenanthroline (Q) A bidentate ligand complex  
(R) Red in reduced form (S) Blue in oxidized form
- (a) P and Q (b) R and S (c) P, R and S (d) P, Q, R and S
74. Each of the following is a glycosaminoglycan dengue fever is
- (a) Chondroitin and dermatan (b) Heparan and heparin  
(c) Hyaluronic acid and keratin (d) Keratin and chitin
75. If X is an equivalent of silver deposited in silver coulometer and Y is an equipment of copper deposited in copper coulometer when constant current is passed through the electrochemical cell for the same time which of the following is correct
- (a)  $X = Y$  (b)  $X = 2Y$  (c)  $X = Y/2$  (d)  $2X = Y$
76. Which of the following classes of medication is the most common initial treatment of men with symptomatic benign prostatic hypertrophy (BPH)
- (a) Alpha-1 agonist (b) Alpha-1 blocker (c) Beta-1 agonist (d) Beta-1 blocker
77. Which of the following reagents can be used for alkaloid detection
- (P) Mayer reagent (Q) Kedde reagent  
(R) Dragendorff reagent (S) Alcoholic solution of 2, 4 dinitrophenylhydrazine
- (a) Only P and Q are correct (b) Only P and R are correct  
(c) Only P and R are correct (d) Only R and S are correct
78. Which schedule Drugs & Cosmetics Act include Particulars to be shown in Manufacturing Records
- (a) Schedule A (b) Schedule V (c) Schedule U (d) Schedule W
79. All of the following statements about Plasmodium falciparum are correct EXCEPT
- (a) Trophozoites, Schizonts and gametocytes are not seen in peripheral blood smear.  
(b) Is associated with recurrent relapses after initial treatment because of liver hypnozoites  
(c) More than one parasite/multiple infection can be seen within single RBC  
(d) Causes more severe disease in pregnancy

80. The chairman of the investigational new Drug (IND) committee in India is
- Drugs controller General of India, Government of India
  - Secretary, Department of Health Research, Government of India
  - Directorate General of Health Sciences, Government of India
  - Secretary, Department of Biotechnology, Government of India
81. In the filling of container what is the meaning of "overflow container"
- Container filled to its minimum capacity
  - Container filled to its maximum capacity
  - Empty container
  - Cleaned container
82. What is the name of floor on which production work is done rather than administration
- Administration area
  - Production area
  - Quality control area
  - Quarantine Area
83. Quinoline contains two basic rings. One of the rings in quinoline. It is attached to second ring via one carbon bridge. Which in the second ring
- 8-Azabicyclo [3.2.1] octane
  - 1-Azabicyclo [2.2.2] octane
  - 1, 4-Diazabicyclo [2.2.2] octane
  - Rubane
84. Which of the first drugs are potentiated by the second
- Phenytoin – Ethinyloestradiol
  - Warfarin – Phenobarbitone
  - Lithium- Thiazide diuretics Potentiated due to reduced Lithium clearance
  - Bromocriptine- Metoprolol
85. Which of the following is a long acting  $\beta_2$  agonist that can be given by nebulization and as well a dry powder inhaler for the treatment of COPD
- Formoterol
  - Albuterol
  - Pulmicort
  - Fluticasone
86. Which anticholinergic drug mostly used as anti Parkinson drug
- Procyclidin
  - Methinicol
  - Tacrin
  - Atropine
87. To create successful new product, a company understands consumers, markets, and competitors and develop a/an
- Impressive advertising campaign
  - Strong web site to push the product
  - Aggressive marketing strategy
  - Product that satisfies consumers' needs
88. Which of the following method is an example of facilitated diffusion?
- Passive diffusion
  - Endocytosis
  - Carrier mediated diffusion
  - Active transport
89. Which of the following causes arterial and bronchial constriction and platelet aggregation
- Prostaglandin  $E_2$
  - Prostaglandin  $A_2$
  - Prostaglandin  $D_2$
  - Thromboxane  $A_2$
90. What is mechanism of action of carbamazepine
- Inhibition of GABA transaminase
  - Blockade of sodium channel
  - Blockade of glutamate receptor
  - Blockade of GABA receptors



91. Passive diffusion follows which order of kinetics  
 (a) Non selective and mixed order (b) Selective and first order  
 (c) Non selective and first order (d) Selective and mixed order
92. Conc v/s time curve drawn from single oral dose, which parameter can be calculated  
 (a) Elimination constant (b) Rate constant (c) Absorption peak (d) Plasma conc.
93. If a basic drug reabsorbed significantly from kidney which of the following statement will be correct  
 (a) Its renal clearance increases in basic urine (b) Its renal clearance decreases in basic urine  
 (c) Its renal clearance increases in acidic urine (d) Its renal clearance decreases in acidic urine
94. o, m, p- isomers can be differentiated on the basis of:  
 (a) Chemical shift (b) Coupling constant  
 (c) Extinction coefficient (d) Dipole moment
95. Monitoring of plasma drug concentration is required while using:  
 (a) Antihypertensive drugs (b) Levodopa  
 (c) Lithium carbonate (d) MAO inhibitors
96. Bacterial endotoxin are mainly detected by  
 (a) Pyrogen test (b) LAL test (c) Thermal test (d) Bacterial test
97. The shelf life of a medicine is defined as :  
 (a) Time required for 10% degradation of drug  
 (b) Time required for 50% degradation of drug  
 (c) Time required for 90% degradation of drug  
 (d) Time required for 100% degradation of drug
98. In which rearrangement reaction, Isocyanate is formed?  
 (a) Curtius (b) Lossen (c) Both A & B (d) None
99. Chitin gets converted in to Chitosan upon:  
 (a) Acetylation (b) Deacetylation  
 (c) Oxidation (d) Reduction
100. Efficiency of drug is checked in modest population in  
 (a) Clinical trial-phase1 (b) Clinical trial-phase2  
 (c) Clinical trial-phase3 (d) Clinical trial-phase4
101. The mixed gland of our body which secretes both hormones and digestive enzyme, so pancreatic enzyme digest which substances  
 (a) Lipids, Protein, Carbohydrate but not Nucleic acid  
 (b) Protein, Carbohydrate, Nucleic acid but not Lipids,  
 (c) Carbohydrate, Lipids, nucleic acid but not Protein
102. In which type of bacteria the cell wall is thicker  
 (a) Gram +ve (b) Gram -ve (c) Both (d) None
103. Out of the following anti cancer drug cardio toxicity is seen in  
 (a) Mitomycin-C (b) Doxorubicin (c) Methotrexate (d) Cyclophosphamide
104. Which of the following free radical is most dangerous free radical  
 (a)  $O^-$  (b)  $H^+$  (c)  $H_2O_2$  (d) Superoxide

105. The phosphate of a metal has the formula  $MHPO_4$ . The formula of its Bromide would be:  
 (a)  $MBr$  (b)  $MBr_2$  (c)  $MBr_3$  (d)  $MBr_4$
106. Silicone based adhesive used in TDDS possess following properties:  
 (a) Chemical and biological inertness (b) Low toxicity  
 (c) Low sensitization and irritation (d) All
107. Schleuniger tester is used for the tablets to measure:  
 (a) Roughness (b) Hardness (c) Dissolution (d) Friability
108. Creatinine clearance is used as a measurement of:  
 (a) Passive renal absorption (b) Glomerular filtration rate  
 (c) Renal excretion rate (d) All
109. 1-[2-[(2-chloro thienyl)methoxy]-2-(2,4-dichlorophenyl)ethyl]-1imidazole is:  
 (a) Oxiconazole (b) Sukonazole  
 (c) Tioconazole (d) Miconazole
110. The drug of choice in prolonged febrile convulsions is:  
 (a) Carbamazepine (b) Diazepam (c) Phenytoin (d) Paracetamol
111. Geometrical isomerism is possible in case of:  
 (a) 2-Pentene (b) Pentane (c) Propene (d) Ethene
112. The loading dose (DL) of a drug is usually based on the:  
 (a) Total body clearance of the drug  
 (b) Percentage of drug bound to plasma proteins  
 (c) Fraction of drug excreted unchanged in the urine  
 (d) Apparent volume of distribution & desired drug concentration in plasma
113. Biologically active arachidonic acid is <http://www.xamstudy.com>  
 (a) All transeicosatetraenoic acid (b) All cis eicosatetraenoic acid  
 (c) All transeicosatrienoic acid (d) All cis eicosatrienoic acid
114. Antidiabetic action of gliburidestart at molecular level by which mechanism  
 (a) Phosphorylation of receptor (b) Binding to potassium ions  
 (c) Decrease in potassium efflux (d) Increase in potassium efflux
115. Momordica charantia having blood sugar lowering activity due to:  
 (a) Momordicin (b) Charantin (c) Momortin (d) Charantiamarin
116. Insulin stimulates glucose transport by promoting the translocation of:  
 (a) GLUT 4 (b) GLUT 2 & GLUT 4  
 (c) GLUT 1 & GLUT 4 (d) GLUT 2
117. Oral rehydration salt contains ionic electrolytes in concentration mmol/L  
 (a)  $Na^+ 20, K^+ 10$  (b)  $Na^+ 40, K^+ 20$  (c)  $Na^+ 53, K^+ 40$  (d)  $Na^+ 60, K^+ 20$
118. In pinacol – pinacolone rearrangement, the final product is ketone. What is the starting compound for the rearrangement  
 (a) 1, 1-diol (b) 1, 2-diol (c) 1, 3-diol (d) Geminal diol

119. Which of the following method is useful for measuring the number of viable cells in a culture
- (a) Plate count technique (b) Dry weight method  
(c) Petroff-Hauser counter (d) Light scattering in a spectrophotometer
120. Seeding involves the spread of cancer cells to
- (a) Blood vessels (b) Serious membranes of body cavities  
(c) Fascia surrounding muscles and bones (d) Dermis and subcutaneous of the skin
121. Barbiturates are being replaced by hypnotic benzodiazepines because of
- (a) Low therapeutic index (b) Suppression in REM sleep  
(c) High potential of physical dependence, abuse (d) All of the above
122. Adverse drug Event reporting in the responsibility of all of the following EXCEPT
- (a) Pharmacist and physician (b) Manufacturer  
(c) Consumer (d) Regulatory authorities
123. Time dependent dilatant behavior is known as
- (a) Thixotropy (b) Rheopexy (c) Rheomalaxis (d) Plastic
124. Chairman of DTAB is:
- (a) Health minister of India (b) Director general of Health services  
(c) Drug controller of India (d) President of AICTE
125. Plasmodesmata is:
- (a) Lignified element (b) Vascular element  
(c) Very fine protoplasmic thread (d) None

**End of paper**

**ANSWER KEY GPAT 2015**

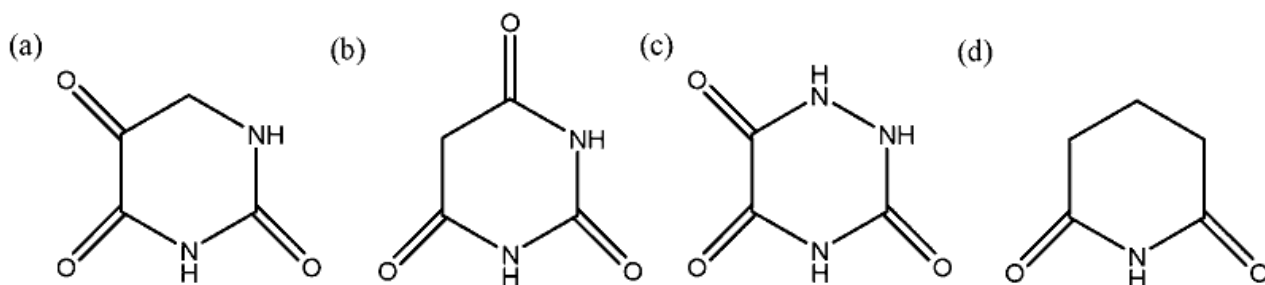
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21-d	22-d	23-d	24-a	25-a	26-a	27-a	28-a	29-a	30-b
31-c	32-c	33-b	34-a	35-b	36-a	37-b	38-d	39-a	40-c
41-d	42-d	43-d	44-b	45-b	46-b	47-c	48-b	49-d	50-d
51-b	52-a	53-d	54-a	55-b	56-a	57-d	58-c	59-b	60-c
61-c	62-a	63-c	64-c	65-a	66-b	67-d	68-b	69-a	70-c
71-c	72-c	73-d	74-d	75-a	76-b	77-b	78-c	79-b	80-a
81-b	82-b	83-b	84-c	85-a	86-a	87-c	88-c	89-d	90-b
91-a	92-b	93-b	94-b	95-c	96-b	97-a	98-c	99-b	100-b
101-a	102-a	103-b	104-d	105-b	106-d	107-b	108-b	109-c	110-b
111-a	112-d	113-b	114-c	115-b	116-c	117-d	118-b	119-a	120-b
121-d	122-d	123-b	124-b	125-d					

# GPAT QUESTION PAPER 2014 WITH ANSWER KEY

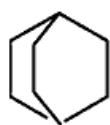
## GPAT QUESTIONS

- \_\_\_\_\_ system does not have orifice to release the drug.  
(a) Elementary Osmotic Pump (b) L-OROS  
(c) Sandwich Osmotic Pump Tablet (d) Controlled Porosity Osmotic Pump Tablet
- In which rearrangement reaction, Isocyanate is formed?  
(a) Curtius (b) Lossen (c) Both A & B (d) None
- Chitin gets converted in to Chitosan upon:  
(a) Acetylation (b) Deacetylation (c) Oxidation (d) Reduction
- All of the following are leaf constants EXCEPT  
(a) Vein-islet number (b) Vein- termination number  
(c) Stomatal number (d) Leaf fiber
- Zink chloride is added to mouth wash because it acts as  
(a) Fragrance (b) Astringent (c) Cooling agent (d) Antibacterial
- The choice of route of administration plays an important role in action of directly acting cholinomimetic . Adverse effect of choline esters that may be avoided by selection of an appropriate route of administration is  
(a) Bradycardia (b) Hypotension (c) Delirium (d) Sweating
- Sieve size 80 has opening of  
(a) 0.100 mm (b) 0.125 mm (c) 0.150 mm (d) 0.180 mm
- The ideal saponification value for suppository base is  
(a) 50-100 (b) 100-150 (c) 150-200 (d) 200-500
- o, m, p- isomers can be differentiated on the basis of:  
(a) Chemical shift (b) Coupling constant  
(c) Extinction coefficient (d) Dipole moment
- Which of the following drug comes under Schedule C<sub>1</sub>  
(a) Opium (b) Ergot (c) Fish liver oil (d) Insulin
- Source of amla is  
(a) Phyllanthus inruri (b) Terminiliachebuk  
(c) Terminalia Bacteria (d) Embika officinalis
- What is the unit of dielectric constant  
(a) Dyne (b) Debey (c) Farad/meter (d) No Unit
- Monitoring of plasma drug concentration is required while using:  
(a) Antihypertensive drugs (b) Levodopa  
(c) Lithium carbonate (d) MAO inhibitors

14. Of the following antibiotics, which one would be acceptable to use when treating penicillin resistant *S. pneumoniae* otitis media  
 (a) Azithromycin (b) Clarithromycin (c) Cefuroxime (d) Cefaclor
15. Addition of which of the following to a large volume parenteral product is not advised  
 (a) Active pharmaceutical ingredient (b) Preservatives  
 (c) Buffering agents (d) Tonicity adjusters
16. A drug suspension decomposes by zero-order kinetics with a rate constant of  $2 \text{ mg mL}^{-1} \text{ month}^{-1}$  if the initial concentration is  $100 \text{ mg mL}^{-1}$  what is the shelf life  
 (a) 2 months (b) 3 months (c) 4 months (d) 5 months
17. Sanguinarine belongs to the subgroup of:  
 (a) Morphinans (b) Benzyl isoquinolines  
 (c) Phthalide isoquinolines (d) Benzophenanthrenes
18. Antidote for paracetamol overdosing is  
 (a) Atropine (b) N-Acetylcysteine (c) Glutathione (d) Theophylline
19. Which one of the following drug combination is contraindicated  
 (a) Glycerol trinitrate and sildenafil (b) Amoxicillin and clavulanic acid  
 (c) Losartan and hydrochlorothiazide (d) Pyrimethamine and sulfadoxine
20. Which sugar is suitable for diabetic patient  
 (a) Fructose (b) Lactose (c) Mannitol (d) Sucralose
21. Headquarter of Bureau of Indian standards is situated at  
 (a) New delhi (b) Mumbai (c) Kolkata (d) Chennai
22. Identify the structure of barbituric acid



23. Ethics for pharmacist are put forth by  
 (a) PCI (b) CDSCO (c) AICTE (d) WHO
24. What is the IUPAC name of the following compound



- (a) Bicyclo[2.2.2] octane (b) Tricyclo[2.2.2] ontane  
 (c) Bicyclo[2.2.0] ontane (d) Bicyclo [2.2.1] heptanes



25. Morphine does not cause:
- (a) Constriction of pupil (b) CNS depression  
(c) Respiratory depression (d) Diarrhoea
26. Which of the following is seed gum
- (P) Gaur gum (Q) Locust bean gum  
(R) Xanthan gum (S) Gellan gum
- (a) P and Q (b) R and S  
(c) Q and R (d) P and S
27. The cancer that derived from ectoderm of endoderm of epithelial cells is
- (a) Carcinoma (b) Sarcoma (c) Leukaemia (d) Myloid
28. Which of the following is/are marine anticancer
- (a) Trabectadine (b) Eribulin  
(c) Cytarabine (d) All of the above
29. Identity the compound which is derived from tryptophan
- (a) Pilocarpine (b) Ephedrine (c) Muscarine (d) Quinoline
30. Opium, cocoa, poppy straw are given in
- (a) Schedule H  
(b) Schedule X  
(c) Narcotic drugs and Psychotropic substances act 1998  
(d) Schedule C
31. Which of the following will be inert in NMR spectrometry
- (a)  $^{13}\text{C}$  (b)  $^{31}\text{P}$  (c)  $^2\text{H}$  (d)  $^1\text{H}$
32. What is the relationship between keto and enol tautomers
- (a) Resonance forms (b) Stereoisomers  
(c) Constitutional isomers (d) Different conformations of the same compound
33. Which of the following is following is true for natural killer cells
- (a) They may phagocytose tumor cells  
(b) Killing of cells is enhanced by interleukin-2  
(c) They recognize and kill some virus-infected cells  
(d) Killing of cells is stimulated by prostaglandin E2
34. Evaluation of colour in tablets is done by
- (a) Reflectance spectrophotometer (b) Tristimulus colorimeter  
(c) Microreflectance photometer (d) All of the above
35. The disintegration time of the effervescent tablets is
- (a) 2 minutes (b) 2.4 minutes (c) 3.5 minutes (d) 5 minutes

36. Identify the false statements about magmas:
- (P) The addition of suspending agents to magmas is always necessary  
 (Q) Magmas differ from gels in that their suspended particles are larger  
 (R) Magmas are two- phase systems  
 (S) Magmas basically are gets
- (a) P and Q                      (b) Q and R                      (c) Only P                      (d) Only S
37. All of the following ACE inhibitors are prodrugs EXCEPT
- (a) Ramipril                      (b) Lisinopril                      (c) Enalapril                      (d) Perindopril
38. All of the following is resistant to both true and pseudo cholinesterase enzymes
- (a) Carbachol                      (b) Acetylcholine  
 (c) Methacholine                      (d) Pilocarpine
39. Globule size of parenteral emulsion should be
- (a) 0.1 to 0.5  $\mu\text{m}$                       (b) 0.5-5  $\mu\text{m}$                       (c) 5-10  $\mu\text{m}$                       (d) Any of the above
40. The objective of audit is to
- (a) Improve the product quality                      (b) Find out the fault  
 (c) Improve the product value                      (d) Find and process fault and to improve
41. .... is an alkaloid derived from aliphatic amino acid
- (a) Reserpine                      (b) Nicotinic acid                      (c) Anabasine                      (d) Vinblastine
42. The drug sulpham blue is obtained from .....source
- (a) Plant                      (b) Animal                      (c) Synthetic                      (d) Mineral
43. In mammals, The major fat in adipose tissue is: <http://www.xamstudy.com>
- (a) Triglyceride                      (b) Cholesterol  
 (c) Sphingophospholipids                      (d) Phospholipids
44. Dovers powder used as a diaphoretic contains:
- (a) Ipecac & Opium                      (b) Ipecac, Senna & Cinchona  
 (c) Opium, Ipecac & Cinchona                      (d) All
45. Biological active form of Vit. D in man is:
- (a) Cholecalciferol                      (b) Calcifediol  
 (c) Calciferol                      (d) Calcitriol
46. Actions and clinical uses of muscarinic cholinceptor agonists include which on of the following
- (a) Bronchodilation (asthama)  
 (b) Improved aqueous humor drainage (glaucoma)  
 (c) Decreased gastrointestinal motility (diarrhea)  
 (d) Decreased neuromuscular transmission and relaxation of skeletal muscle (During surgical anesthesia)



47. Regarding the role of surfactants in pharmaceutical suspensions for oral administration which of the following statements is false
- (a) Surfactants decrease the water contact angle of dispersed drug particle
  - (b) Surfactants promote flocculation
  - (c) Surfactants with high HLB stabilize oral suspensions
  - (d) Surfactants increase the viscosity of the continuous phase of pharmaceutical suspensions
48. Which of the following drug is NOT used in treatment of H. Pylori infection
- (a) Ampicillin
  - (b) Clarithromycin
  - (c) Mosapride
  - (d) Bismuth subgallate
49. The most suitable disinfectant for decontamination of HIV contaminated endoscope is
- (a) 1% Sodium hypochlorite
  - (b) 2% Glutaraldehyde
  - (c) 5% phenol
  - (d) 70% ethanol
50. Which rule does provide the most accurate method to calculate the dose for child based on adult dose
- (a) Age in months
  - (b) Age in years
  - (c) Weight in pounds
  - (d) Body surface area
51. Chemokine co-receptor 5 (CCR 5 ) inhibitor is
- (a) Enfuvirtide
  - (b) Maraviroc
  - (c) Raltegravir
  - (d) Atazanavir
52. The Franz diffusion cell which is used for the evaluation of transdermal drug delivery systems consists of:
- (a) 1 chamber
  - (b) 2 chamber
  - (c) 3 chamber
  - (d) None
53. Which of the following plastic is transparent and flexible
- (a) Silicon rubber
  - (b) PVP
  - (c) HDPE
  - (d) PE
54. In which method an order of a fixed number of items is placed every time an inventory level falls to a predetermined point
- (a) A-B-C method
  - (b) Maximum and minimum method
  - (c) Open-to-buy method
  - (d) Economic order quantity
55. Choose the option with two reducing sugars
- (a) Lactose and maltose
  - (b) Trehalose and sucrose
  - (c) Maltose and trehalose
  - (d) Economic order quantity
56. The Local anesthetic with highest cardiotoxicity is
- (a) Lidocaine
  - (b) Bupivacaine
  - (c) Levo- bupivacaine
  - (d) Procaine
57. Homatropine is
- (a) Tropine ester of amino acetic acid
  - (b) Tropine ester of mandelic acid
  - (c) Tropine methyl bromide ester of mandelic acid
  - (d) Tropine ester of amino formic acid
58. Tranexamic acid is
- (a) Antithrombotic
  - (b) Antifibrinolytic
  - (c) Fibrinolytic
  - (d) Styptic

59. Which of the antihistaminic compound has antiadrogenic effect
- (a) Famotidine (b) Ranitidine  
(c) Nizatidine (d) Cimetidine
60. Which of the following drug is used preferentially as preanesthetic mediation
- (a) Midazolam (b) Oxazepam  
(c) Alprazolam (d) Nitrozepam
61. Proton pump inhibitors are most effective when given
- (a) Half hour before meals (b) With meal  
(c) After prolonged fasting (d) Along with H2 blockers
62. Match compounds in Group I with inhibitory activities in Group II
- | Group I                | Group II                |
|------------------------|-------------------------|
| (P) Vancomycin         | (1) Folate metabolism   |
| (Q) Rifampin           | (2) DNA synthesis       |
| (R) Puromycin          | (3) Protein synthesis   |
| (S) Ciprofloxacin      | (4) RNA synthesis       |
|                        | (5) Cell wall synthesis |
| (a) P-5, Q-4, R-3, S-2 | (b) P-4, Q-3, R-1, S-2  |
| (c) P-4, Q-1, R-3, S-2 | (d) P-5, Q-3, R-2, S-4  |
63. Formation of Okazaki occurs in
- (a) Transcription (b) Replication  
(c) Translation (d) Reverse Transcription
64. Drug used in ventricular arrhythmia is
- (a) Flecainide (b) Verapamil  
(c) Esmolol (d) Diltazem
65. The lipoprotein with the fastest electrophoretic mobility and the lowest TG content is
- (a) VLDL (b) HDL  
(c) LDL (d) Chylomicrons
66. As per schedule 'Y' of the drugs and cosmetics act, the animal toxicity study requirements for marketing of a drug depends upon tentative route and duration of administration in humans. In This context , which one of the following statements is incorrect
- (a) Single dose human use-animal toxicity for 2 weeks in 2 species  
(b) Oral use for 2 weeks in humans- animal toxicity for 4 week in 2 species  
(c) Aerosol use by repeated use in humans- animal toxicity for 24 weeks in 2 species  
(d) Multiple daily ocular application for short duration-irrigation test in 1 species for 3 weeks
67. For determining the efficacy of sterilization in an autoclave, the spores of the following organism are used as test organisms
- (a) Bacillus cereus (b) Clostridium pefringens  
(c) Bacillus stearothemophilus (d) Clostridium histolyticum

68. Which of the following pairs is mismatched
- (a) Aerobic, helical bacteria- gram negative (b) Entrics- gram negative  
(c) Mycobacteria – acid fast (d) Pseudomonas –gram positive
69. List of drugs whose import, manufacture and sale, labeling and packaging are governed by special provisions are included in schedule:
- (a) X (b) K (c) H (d) G
70. Sigma minus method is used in assessment of
- (a) Bioavailability (b) Absorption  
(c) Metabolism (d) Tissue distribution
71. Which of the plant family contains volatile oil in their trichome
- (a) Rutaceae (b) Papaveraceae  
(c) Umbelliferaceae (d) Lamiaceae
72. Ferritin is:
- (a) Coenzyme (b) The stored form of Iron  
(c) Non-protein moiety (d) Isoenzyme
73. Which oil is soluble in alcohol
- (a) Arachis oil (b) Sesame oil  
(c) Castor oil (d) Corn oil
74. One of the first step of the citric acid cycle is isomerization of citric acid to isocitric acid this step is necessary because
- (a) Oxidation of secondary alcohols is very difficult  
(b) Reduction of secondary alcohol is very impossible  
(c) Reduction of tertiary alcohols would require a very powerful oxidizing agent  
(d) Oxidation of tertiary alcohols would require oxidizing agents
75. Which of the following alkyl halides would undergo SN2 reaction most rapidly
- (a)  $\text{CH}_3\text{CH}_2\text{-Br}$  (b)  $\text{CH}_3\text{CH}_2\text{-Cl}$   
(c)  $\text{CH}_3\text{CH}_2\text{-I}$  (d)  $\text{CH}_3\text{CH}_2\text{-F}$
76. Mechanism of action of Ketoconazole is:
- (a) Inhibits Ergosterol synthesis (b) Inhibits DNA gyrase  
(c) Inhibits dihydropteroate synthetase (d) Induces translation misreading
77. All are adrenal gland over activity disorders EXCEPT
- (a) Addison's disease (b) Conn's syndrome  
(c) Cushing's syndrome (d) Cushing's disease
78. The oil used in a parenteral product cannot contain.....
- (a) WFI (b) Paraffin oil (c) Peanut oil (d) Glycerine
79. Identify the non-absorbable suture
- (a) Catgut suture (b) Chromic catgut suture  
(c) Silk suture (d) Polydioxanone suture

80. The relative lowering of vapour pressure is given by  
 (a) Raoult's law                      (b) Henry's law                      (c) Boyle's law                      (d) Charles law
81. Identify the functional group present in meprobamate  
 (a) Amide                      (b) Ester                      (c) Carbamic                      (d) Lactam
82. Match the following
- |                   |                                |
|-------------------|--------------------------------|
| (P) Gypsum salt   | (1) $KAl(SO_4)_2 \cdot 12H_2O$ |
| (Q) Epsom salt    | (2) $FeSO_4 \cdot 7H_2O$       |
| (R) Alum          | (3) $CaSO_4 \cdot 2H_2O$       |
| (S) Green vitriol | (4) $MgSO_4 \cdot 7H_2O$       |
- (a) P-1, Q-2, R-4, S-3                      (b) P-3, Q-4, R-1, S-2  
 (c) P-4, Q-3, R-1, S-2                      (d) P-2, Q-4, R-1, S-3
83. Tinea capitis is ringworm infection of  
 (a) Feet                      (b) Groin                      (c) Head                      (d) Nails
84. Rank the following compounds in order of increasing reactivity in electrophilic aromatic Substitution reactions  
 (P)  $C_6H_6$                       (Q)  $C_6H_5CH_3$                       (R)  $C_6H_5NO_2$   
 (a)  $Q < P < R$                       (b)  $R < P < Q$                       (c)  $Q < R < P$                       (d)  $P < Q < R$
85. Dose dumping may be a general problem in the formulation of:  
 (a) Soft gelatin capsules                      (b) Suppositories  
 (c) Modified release drug products                      (d) None
86. Codeine differ in structure from morphine by:  
 (a) N-methyl group                      (b) Acetyl group at C1 and C6  
 (c)  $-OC_2H_5$  group                      (d)  $-OCH_3$  group
87. Isotopes differ in:  
 (a) The number of protons                      (b) The valency number  
 (c) The chemical activity                      (d) The number of neutrons
88. Arrange the given acids in increasing order as per the number of carbons present in them  
 (P) Capric                      (Q) Caprylic                      (R) Caproic                      (D) Lauric  
 (a)  $P < Q < R < S$                       (b)  $R < Q < P < S$   
 (c)  $R < Q < P < S$                       (d)  $Q < P < R < S$
89. E1cb (Elimination reaction via conjugate base) which reaction intermediate will form?  
 (a) Carbocation                      (b) Carbanion  
 (c) Free radical                      (d) All
90. What are the three basic steps of conventional PCR  
 (a) Denature, anneal, & Strand displacement                      (b) Denature, anneal & extension  
 (c) Strand displacement, synthesis & release                      (d) Reverse-Transcription, anneal & extend

91. Rabies bodies are

- (a) Negri bodies (b) Cowdry type B inclusion bodies  
(c) Cowdry type A inclusion bodies (d) Bollinger bodies

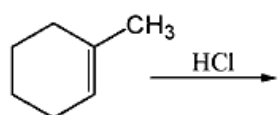
92. When glucose reacts with bromine water, the main product is

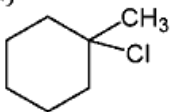
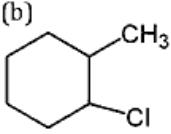
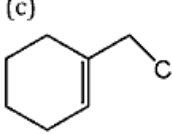
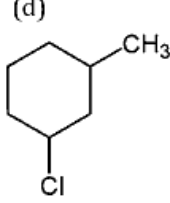
- (a) Glucaric acid (b) Glucuronic acid (c) Sorbitol (d) Gluconic acid

93. Increase in melting temperature of DNA is due to high content of

- (a) A+T (b) G+C (c) A+G (d) T+G

94. What will be the primary product of the following reaction



- (a)  (b)  (c)  (d) 

95. The mass spectrum of a compound with an approximate MW 137 shows two equally intense peaks at  $m/z$  136 and 138. What does this suggest

- (a) The compound is alkyl iodide (b) The compound is alkyl bromide  
(c) The compound is alkyl chloride (d) The compound is alkyl fluoride

96. Capping in tablets mainly due to:

- (a) Less upper punch pressure (b) Poor flowability of granules  
(c) Proper formulation design (d) Entrapment of air in tablet during compression

97. How can we detect the rhizome from the root of the Rauwolfia?

- (a) By the presence of small central pith (b) By the absence of small central pith  
(c) By the presence of vascular bundle (d) None

98. Drug of choice to treat H1N1 influenza is

- (a) Adefovir (b) Cidofovir  
(c) Oseltamivir (d) Tenofovir

99. Identify the correct statement

- (P) Condensed tannins are polymers of flavans  
(Q) Condensed tannins do not contain sugar residues  
(R) Hydrolyzable tannins are polymers of gallic acid or ellagic acids  
(S) Gallic acid and catechin are polyphenols  
(a) Only Q (b) P and Q  
(c) P, Q and R (d) P, Q, R and S

100. Quick breaking aerosols are applicable:

- (a) Orally (b) Parenterally (c) Topically (d) Ophthalmically



101. In the Reimer-Tiemann reaction..... Reacts with phenol to give the ortho-formylated product

- (a) Carbene (b) Carbocation  
(c) Carbanion (d) Free radical

102. Which of the following is not added to chewing tablet

- (a) Gildant (b) Disintegrant  
(c) Lubricant (d) Anitadhesive

103. Range of C=O stretching in enol is

- (a)  $1800\text{ cm}^{-1}$  (b)  $1710\text{ cm}^{-1}$   
(c)  $1685\text{ cm}^{-1}$  (d)  $1655\text{ cm}^{-1}$

104. Match the following phytochemicals with their source and use

- (P) Shatavrin (1) Buckwheat and citrus fruits, strengthens capillary walls  
(Q) Resveratrol (2) Broccoli and cabbage, protects against bladder cancer  
(R) Glucosinolates (3) Purple grape, anti inflammatory, anticancer  
(S) Rutin (4) Asparagus, galactagogue

- (a) P-4, Q-3, R-2, S-1 (b) P-4, Q-2, R-3, S-1  
(c) P-3, Q-1, R-4, S-2 (d) P-2, Q-3, R-4, S-1

105. Which RNA polymerase is the only whose product are capped

- (a) RNA polymerase I (b) RNA polymerase II  
(c) RNA polymerase III (d) RNA pimase

106. Match the scientist awarded with Nobel prize with their contributions

- (P) Alexander Fleming (1) GPCR  
(Q) Kobilka (2)  $\beta$ -blocker  
(R) Banting (3) Penicillin  
(S) Black (4) Insulin

- (a) P-4, Q-3, R-2, S-1 (b) P-4, Q-2, R-3, S-1  
(c) P-3, Q-1, R-4, S-2 (d) P-2, Q-3, R-4, S-1

107. Mean arterial pressure is <http://www.xamstudy.com>

- (a) Systolic pressure – Diastolic Pressure (b)  $(\text{Diastolic pressure} + \text{Diastolic Prssure})/2$   
(c) Diastotic alcohol +  $(1/3) \times$  pulse pressure (d) Stroke volume X heart rate

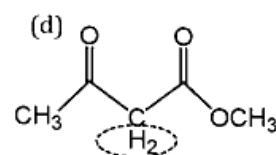
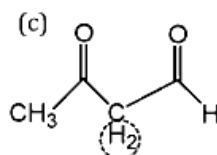
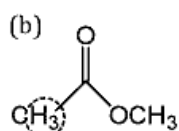
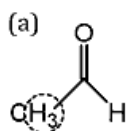
108. Eugenol is

- (a) Monoterpene alcohol (b) Sesquiterpene alcohol  
(c) Aliphatic alcohol (d) Phenylpropene

109. The Vitamin required for carboxylation of pyruvate to form oxaloacetate is

- (a) Thiamine (b) Biotin (c) Pyridoxine (d) Niacin

110. Which of the following circled hydrogen is most acidic



111. The drug formulated as suspension follows ..... order reaction

- (a) Zero
- (b) Pseudo Zero
- (c) First
- (d) Pseudo first

112. Which diuretic causes decrease in release of insulin

- (a) Chlorothiazide
- (b) Ethacynic zero
- (c) Triamterene
- (d) Acetazolamide

113. Match the following drugs with their mode of action

- (P) Methotrexate
- (Q) Cyclophosphamide
- (R) Vincristine
- (S) Dactinomycin
- (a) P-4, Q-3, R-2, S-1
- (b) P-2, Q-4, R-1, S-3
- (c) P-3, Q-1, R-4, S-2
- (d) P-2, Q-3, R-1, S-4
- (1) Mitotic inhibitor
- (2) Antimetabolite
- (3) Alkylating agent
- (4) Intercalating agent

114. Which compound would be expected to show intense IR absorption at  $3300\text{ cm}^{-1}$

- (a)  $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_3$
- (b)  $\text{CH}_3\text{CH}_2\text{C}=\text{CH}$
- (c)  $\text{CH}_3\text{C}=\text{CCH}_3$
- (d)  $\text{CH}_2\text{CHCH}_2\text{CH}_3$

115. In the carbon NMR, in what region of the spectrum does one typically observe carbons which are part of the aromatic ring

- (a) -10-0 ppm
- (b) 40-60 ppm
- (c) 80-100 ppm
- (d) 120-150 ppm

116. Meclofenamate belongs to which class of drug

- (a) Slicylates
- (b) Oxicams
- (c) Aryl antaranillic acid
- (d) p-Amino phenols

117. Match the following crude with their chemical constituents

- (P) Aloe
- (Q) Ginger
- (R) Lemon peel
- (S) Olive oil
- (a) P-4, Q-3, R-2, S-1
- (b) P-3, Q-4, R-2, S-1
- (c) P-3, Q-4, R-1, S-2
- (d) P-3, Q-1, R-1, S-4
- (1) Hesperidine
- (2) Palmitin
- (3) Barbaloin
- (4) Allin

118. Dopamine agonists with tetralene function

- (a) Ropinorole
- (b) Pirebidil
- (c) Pramipixole
- (d) Rotigotine

119. The IUPAC name of the compound  $(\text{CH}_3)_2\text{CHCH}_2\text{Cl}$ :

- (a) 2-methyl-3-chloropropane
- (b) 1-chloro-3-mehtyl butane
- (c) 1-chloropentane
- (d) 2-mehtyl-4-chlorobutane



120. A powerful inhibitor of stomatal opening is

- (a) Auxin (b) Bytokinin  
(c) Gibberellin (d) Abscisic acid

121. What is the renal clearance of a substance, if its concentration in plasma is 10mg, concentration in urine is 100 mg and urine flow is 2 ml/min

- (a) 0.02 ml/min (b) 0.2 ml/min  
(c) 2ml/min (d) 20 ml/min

122. Aim of pharmacovigilance is

- (a) To monitor drug toxicity (b) To monitor unauthorized drug manufacture  
(c) To monitor rational use of drugs (d) To check and control drug costs

123. Phase zero studies is a/an

- (P) Exploratory investigational new drug study  
(Q) Human microdosing studies  
(R) Step to speed up drug discovery/ development process  
(S) Mandatory by FDA

- (a) P and Q (b) Q and R (c) P, Q and R (d) P, Q, R and S

124. Parenteral product must be:

- (a) Packed in bottle (b) Sterilized  
(c) Free from viable/living organism (d) Pyrogenic

125. Quinine present in highest amount in:

- (a) C. calisaya (b) C. officinalis (c) C. ledgeriana (d) C. succirubra

**End of paper**

**ANSWER KEY GPAT 2014**

1-d	2-c	3-b	4-d	5-b	6-b	7-d	8-c	9-b	10-c
11-d	12-d	13-c	14-c	15-b	16-d	17-b	18-b	19-a	20-d
21-a	22-b	23-a	24-a	25-d	26-a	27-a	28-d	29-b	30-b
31-c	32-c	33-c	34-d	35-d	36-c	37-b	38-a	39-a	40-d
41-c	42-c	43-a	44-a	45-d	46-b	47-d	48-c	49-b	50-d
51-b	52-b	53-d	54-d	55-a	56-b	57-b	58-b	59-d	60-a
61-a	62-a	63-b	64-a	65-b	66-d	67-c	68-d	69-a	70-a
71-d	72-b	73-c	74-d	75-c	76-a	77-b	78-b	79-c	80-a
81-c	82-b	83-c	84-a	85-c	86-d	87-d	88-b	89-b	90-b
91-a	92-d	93-d	94-c	95-b	96-d	97-a	98-c	99-d	100-c
101-a	102-b	103-d	104-a	105-b	106-c	107-c	108-d	109-b	110-c
111-a	112-b	113-d	114-b	115-d	116-c	117-c	118-d	119-a	120-d
121-d	122-a	123-c	124-b	125-c					

# GPAT QUESTION PAPER 2013 WITH ANSWER KEY

## GPAT QUESTIONS

1. Heckel's plot represents .....
  - (a) Extent of plastic and elastic deformation of material during compaction
  - (b) Force-time of force-displacement relationship
  - (c) Pressure-porosity (volume) relationship
  - (d) Stress relaxation measurements
2. Which of the following would cause increase in the binding strength at the dry granulation process in significant degree
  - (a) Carboxymethylamylopectiglycolate
  - (b) Macrogol 4000
  - (c) Magnesium Stearate
  - (d) Lactose
3. The correct statements concerning concertation microencapsulation
  - (1) Concertation always leads to monophasic microcapsule
  - (2) When the gelatin is used for microcapsule's wall material, the concertation is bound to happen
  - (3) Only gelatin can be used for microcapsule's wall
  - (4) Simple or compound concertation can be distinguished according to the number of macromolecular colloids taking part in the process
  - (5) The pH conditions of the system and the solubility of the auxiliary materials do not have any effect on the preparation of the microcapsule
  - (a) Only 1 and 4 are correct
  - (b) Only 2 and 3 are correct
  - (c) Only 1 and 5 are correct
  - (d) Only 2 and 4 are correct
4. Cyclohexanone exhibits only ..... peaks in  $^{13}\text{C}$ NMR spectrum due to symmetry
  - (a) 2
  - (b) 3
  - (c) 4
  - (d) 5
5. If an organic compound does not absorb UV visible radiation it means compound does not contain .....
  - (a) Single bond
  - (b) Sigma bond
  - (c) Conjugated double bond
  - (d) Dative bond
6. The positively polarized carbon atom of a carbonyl group acts as.....
  - (a) An electrophile and a lewis base
  - (b) A nucleophile and a lewis acid
  - (c) A nucleophile and a lewis base
  - (d) An electrophile and a lewis acid
7. The Pinene hydrochloride rearranged into bornylterpenoid is called as.....
  - (a) Wagner-Meerwein rearrangement
  - (b) A nucleophile and a lewis acid
  - (c) Fries rearrangements
  - (d) Backmann rearrangement
8. The mouse model for type I diabetes mellitus is.....
  - (a) NZB mouse
  - (b) SCID mouse
  - (c) Nude mouse
  - (d) NOD mouse

9. Cholesterol contributors to ..... Of the biological membrane
- (a) Rigidity (b) Fluidity  
(c) Permeability (d) Osmolality
10. Active site for all serine proteases consists of which triad
- (a) Ser-Glu-Asp (b) Ser-Glu-Met  
(c) Ser-His-Asp (d) Ala-Glu-Met
11. \_\_\_\_\_, Anthelmintics having Immunosuppressant activity.
- (a) Piperazine (b) Levamisole (c) Ivermectin (d) Niclosamide
12. Which of the following is selective  $\alpha_2$  selective antagonist
- (a) Clonidine (b) Prozac  
(c) Phentamine (d) Yohimbine
13. Which one of the following is NOT a protoplast fusion agent
- (a) Inactivated Sendai Virus (b)  $Ca^{++}$  at alkaline pH  
(c) Polythelen glycol (d) Colchicine
14. Clinically used Labetolol is .....
- (a) S, S (b) R, R (c) R, S (d) S, R
15. For intramuscular injection, angle of administration is..... Degree
- (a) 30 (b) 45 (c) 60 (d) 90
16. Aromatase is an enzyme complex that is the target for several anticancer drugs. Which of the following anticancer drugs targets aromatase
- (a) Cyproterone acetate (b) Raloxifene  
(c) Aminoglutethimide (d) Testosterone propionate
17. Vinca alkaloids that are used in combination therapy to treat a variety of tumors. How do cancer cells normally gain resistance to these agents
- (a) Mutation of the target structure  
(b) Overexpression of the carrier protein called P- glycoprotein  
(c) Increased metabolism of the drug  
(d) Decreased ability of the drug to enter target cells
18. A set of closely related genes of generic markers that are inherited as a single unit is
- (a) Cistron (b) Gene families (c) Haplotype (d) Haploid
19. Ginseng saponins belong to the series of.....
- (a) Lupane (b) Birsane (c) Oleanane (d) Dammarane
20. Stokes Einstein equation is related to the series of.....
- (a) Energy changes in Sedimentation suspension setting  
(b) Sedimentation of suspension  
(c) Diffusion coefficient  
(d) Coefficient of energy consumption
21. The source of radiation for FAR IR spectrometer is.....
- (a) Golay cell (b) Nernst glower and glabar  
(c) Mercury lamp (d) Highly heated tungsten filament

22. Which of the following alkaloids derived from lysine
- (a) Emtin (b) Cinchonidin  
(c) Brucin (d) Lobelin
23. The agent that can only be given intravenously for heart failure is.....
- (a) Digoxin (b) Amiodarone  
(c) Quinidine (d) Dobutamine
24. A prescription order for an antibiotic preparation includes the directions 'ii gtt AU q.i.d' what auxiliary label should be affixed to the prescription order container
- (a) Take with meals (b) For the eye  
(c) For rectal use (d) For the ear
25. Which one of the following amino acid residues is specifically recognized by chymotrypsin during peptide bond cleavage
- (a) Phe (b) Leu (c) Val (d) Asp
26. Which of the following criteria should be considered when reviewing a medication for addition to the hospital formulary
- (a) The amount of samples provided to hospital physicians  
(b) Research funds donated to the hospital by the pharmaceutical company  
(c) National adverse drug reaction reports  
(d) Whether is a gluten-free oral formulation
27. Identify the GABA reuptake inhibitor
- (a) Progabide (b) Tigabine (c) Bicuculline (d) Baclofen
28. What is the reason of complicated penetration of some drugs through brain-blood barrier
- (a) High lipid solubility of a drug <http://www.xamstudy.com>  
(b) High endocytosis degree in a brain capillary  
(c) Absence of pores in the brain capillary endothelium  
(d) Meningitis
29. Reynold's number is given by.....
- (a)  $Re = \mu/\rho vD$  (b)  $Re = \rho v/\mu D$   
(c)  $Re = \rho vD/\mu$  (d)  $Re = vD/\rho\mu$
30. The increase in concentration of second messengers (cAMP, cGMP,  $Ca^{2+}$  etc.) leads to:
- (a) Inhibition of intracellular protein kinases and protein phosphorylation  
(b) Protein kinases activation and protein phosphorylation  
(c) blocking of interaction between a receptor and an effector  
(d) Antagonism with endogenous ligands
31. Which of the following cholinomimetics activates both muscarinic and nicotinic receptors
- (a) Lobeline (b) Pilocarpine (c) Carbachol (d) Bethanechol
32. Deoxy position of deoxyribose in DNA is at.....
- (a) 1<sup>st</sup> carbon (b) 2<sup>nd</sup> carbon (c) 3<sup>rd</sup> carbon (d) 5<sup>th</sup> carbon
33. All are potent 3A4 inhibitors EXCEPT.....
- (a) Antifungals (-azoles) (b) Protease inhibitors (-avir)  
(c) Macrolides (-mycin) (d) Barbiturates

34. 'Probability of nonsterility' is given by.....
- (a) F value                      (b) Z value                      (c) D value                      (d) None of the above
35. Which of the following is a selective medium for the growth of vibreochelerae
- (a) Thayer martin medium                      (b) Cefoxitin cycloserine fructose agar  
(c) Skirrow's medium                      (d) Thiosulfate citratr bile surcrose agar
36. Specific conductance unit is.....
- (a) Ohm cm<sup>-1</sup>                      (b) Mho cm<sup>-1</sup>                      (c) Ohm cm                      (d) None of the above
37. Karplus curve is associated with which spectroscopy
- (a) UV                      (b) Mass                      (c) FTIR                      (d) NMR
38. Which of the following pair of volujmetric method of argentometric titration and indicator used is matched correctly
- (1) Fajan's Method                      Chromate  
(2) Mohr's method                      Fluroescsein  
(3) Vohlard's method                      Ferric salt
- The method and indicator matches correctly in.....
- (a) 1 and 2 only                      (b) 2 and 3 only                      (c) 3 only                      (d) 2 only
39. The reaction of the citric acid cycle that is most similar to the pyruvate dehydrogenase complex catalyzed conversion of pyruvate to acetyl-CoA is the conversion of
- (a) Citrate to isocitrate                      (b) Fumarate to malate  
(c) Malate to oxaloacetate                      (d) α-ketogultarate to succinyl-CoA
40. Which one of the following pairs of lipids & related compounds exhibit opposite biological activities
- (a) 5-HPETE & leukotriene D4                      (b) Cholic acid & Lithocholic acid  
(c) Neuraminidase Inhibitors                      (d) Acetone & β-hydroxybutyprate
41. HIV may NOT respond to.....
- (a) Nucleoside analogues                      (b) Protease inhibitors  
(c) Neuraminidase inhibitors                      (d) Reverse transcriptase inhibitors
42. Palmitic, oleic or stearic acid ester of cholesterol used manufacture of cosmetic creams is.....
- (a) Oleo oil                      (b) Lanoline                      (c) Spermaceti                      (d) Chaulmoogra oil
43. .... Is needed for suspensions, lotions, emulsions, creams and ointments to keeps a high container consistency and yet pour and spread easily when needed. It also is satisfactory for IM slow release yet easy to inject
- (a) Thinxotropy                      (b) Rheopecty                      (c) Rheology                      (d) Newtonian flow
44. The enzyme superoxide dismutase (SOD) converts
- (a) O<sub>2</sub>-to hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>)                      (b) Hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>) to H<sub>2</sub>O  
(c) H<sub>2</sub>O to hydroxyl (OH) redicals                      (d) O<sub>2</sub>- to O<sub>2</sub>
45. For first order reactions the rate constant, k, has the units as.....
- (a) Ms<sup>-1</sup>                      (b) M<sup>-1</sup> s<sup>-1</sup>                      (c) M<sup>-2</sup> s<sup>-1</sup>                      (d) s<sup>-1</sup>



46. Which of the following may be used to assess the relative bioavailability of two chemically equivalent drug product in a crossover study
- (a) Dissolution test (b) Peak concentration  
(c) Time-to-peak concentration (d) Area under the plasma level time curve
47. A 25.0 mL sample of a solution of a monoprotic acid is titrated with a 0.115 M NaOH solution the titration curve shows equivalence point at 7.05. which of the following indicators would be best for this titration
- (a) Methyl red (b) Bromthymol blue (c) Thymol blue (d) Phenopltakin
48. Which of the following in termed as mass filter
- (a) Time of flight (b) Farady cup (c) Quadupole (d) Ion trap
49. Which of the following is produced in phenyl propanoid pathway
- (a) PHenolics (b) Catotenes (c) Alkaloids (d) Terpenes
50. A diode array detector coupled with UV detection is advantageous because it
- (a) Covers a range of wavelengths  
(b) Allow lower concentrations of analyte to be detected  
(c) Speeds up the detection at a single wavelength  
(d) Allows a single wavelength of detection to be moreprecisely chosen
51. The LOD of an analysis is at the femtogram level. This corresponds to detection at the
- (a) 1 in  $10^{-18}$  level (b) 1 in  $10^{-15}$  level (c) 1 in  $10^{-12}$  level (d) 1 in  $10^{-9}$  level
52. Which are those therapeutic systems, which liberate the active ingredient through a special hole, prepared by laser
- (a) TTS patches (b) IUD systems (c) OCUSERT systems (d) OROS systems
53. Which of following chromatographic technique is most suitable for small, nonvolatile water-insoluble solutes
- (a) GC (b) Reverse phase LC  
(c) Normal phase LC (d) SEC
54. Which of the following antiviral agent in not a nucleoside analog
- (a) Moroxidin (b) Vidarabine  
(c) Cytarabine (d) Idoxuridine
55. Regarding two compartment pharmacokinetics all are true EXCEPT
- (a) A drug is always removed from the peripheral compartment  
(b) A drug with a high volume of distribution is likely to be lipophilic  
(c) A drug can have a short duration of action while being eliminated very slowly  
(d) Most anesthetic drugs are modelled well with a two-compartment model
56. Phenothiazine is obtained by.....with sulfur
- (a) Cyclization of dibenzyl (b) Cyclization of diphenyl amine  
(c) Reduction of diphenyl amine (d) Reduction of dibenzyl amine
57. Vitamin K is constituted of .....ring
- (a) Hdroquinone (b) Nathphaquinone  
(c) Lonone (d) Denzimidazole

58. To balance intellectual property protection, competition and access to affordable prescription drug, the act made by US government is
- (a) Drug Price Competition act (b) Patent term Restoration act  
(c) Hatch-Waxman act (d) Orphan Drug Act
59. Gridnard test is used for the detection of.....
- (a) Flavonoids (b) S- glycosides  
(c) Cyanogenetic glycosides (d) O-glycosides
60. Which hormone works antagonistically to parathormone.....
- (a) Triiodothyronine (b) Insulin (c) Estrogen (d) Calcitonin
61. Drugs that have been found to be useful in one or more types of heart failure include all of the following EXCEPT.....
- (a) Na<sup>+</sup>/K<sup>+</sup> ATPase inhibitors (b) α adrenoceptor agonist  
(c) β Adrenoceptor agonists and antagonists (d) ACE inhibitors
62. Which one of the following is used in the Ames test
- (a) E. coli (b) Streptococcus aureus  
(c) Pseudomonas aerogenosa (d) Salmonella typhimurium
63. Which of the ultrashort acting adrenergic blocker
- (a) Carvedilol (b) Atenolol (c) Esmolol (d) Acetazolol
64. Match the following biochemical transformations with coenzymes involved
- (i) α -Ketoglutarate to glutamic acid (a) Tetrahydrofolate  
(ii) Uridine to thymidine (b) NADH  
(iii) Pyruvic acid to acetyl coenzyme A (c) Thiamine pyrophosphate  
(d) Pyridoxamine
- (a) i-d, ii-a, iii-c (b) i-a, ii-b, iii-d  
(c) i-b, ii-a, iii-c (d) i-d, ii-b, iii-c
65. Drugs that show nonlinear pharmacokinetics have which of the following property
- (a) A constant ratio of drug metabolites is formed as the administered dose increase.  
(b) The elimination half - life increasing as the administered dose increase  
(c) The area under the plasma drug concentration versus time curve increasing in direct proportion to an increase in the administered dose.  
(d) Both low and high doses follow first order elimination kinetics  
(e) The steady state drug concentration increases in direct proportion to the dosing rate
66. Appropriate reasons for the deviation from the Beer's law among the following are
- (P) Monochromaticity of light (Q) Very high concentration of analyte  
(R) Association of analyte (S) Dissociation of analyte
- (a) P, Q AND R (b) Q, R, and S  
(c) P, R and S (d) P, Q and S
67. An alternative to glycolysis pathway is.....
- (a) Glyoxylate pathway (b) Pentose phosphate pathway  
(c) Citric acid cycle (d) Gluconeogenesis



68. LeChatelier's principle states that increasing temperature favors a reaction that.....
- (a) Release energy as heat (b) Requires energy as heat  
(c) Involves a chemical catalyst (d) Gluconeogenesis
69. In absorption spectrometry, high values of absorbance values (grater than 1 or 2) tend to give poorer precision because
- (a) Too much light saturates the detector  
(b) Little light reaches the detector  
(c) Beer's law deviations are worse  
(d) Monochromators work poorly under intense light
70. When the angle of repose exceeds..... , the powder flow is rarely acceptable for pharmaceutical manufacturing purpose
- (a) 25 (b) 30 (c) 50 (d) 60
71. The chelate, EDTA4- can be described as what type of chelating ligand
- (a) Bidentate (b) Tetradentate (c) Hexadentate (d) Tridentate
72. Living cells are negatively charged inside primarily because of.....
- (a) ATP, organic acids, and other negative molecules that cannot escape  
(b) Removal of sodium ions, which are positively charged, by the Na<sup>+</sup>/K pump  
(c) Extrusion of Ca<sup>2+</sup> ion, which is much more concentrated outside a cell than inside  
(d) Cell membranes that are more permeable to potassium than sodium
73. Which of the following drugs requires administration on an empty stomach
- (a) Naproxen (b) Levothyroxine  
(c) Prednisone (d) Nitrofurantoin
74. Which of the following is a non-aqueous binder
- (a) Ethyl cellulose (b) Starch (c) Veegum (d) Bentonite
75. Which of the following drugs requires administration on an empty stomach
- (a) Cannabichromene (b) Cannabinol  
(c) Cannabidiol (d) Tetrahydrocannabinol
76. What is the osmolality of a solution if one mmole of glucose and two mmoles of NaCl are dissolved in 1 kg of the water
- (a) 3 mOsm (b) 4 mOsm (c) 5 mOsm (d) 6 mOsm
77. How much can be the working revolution per minute (RPM) of the ball mill
- (a) 23-28 "D where D means the diameter of jar  
(b) Two times more than the critical revolution per minute  
(c) 42.3 "D (D=diameter of the jar)  
(d) The average of critical RPM and the optional RPM
78. A compound with an -OH group and -OR group bonded to the same carbon atom is.....
- (a) An acetal (b) A hemiacetal (c) A simple ether (d) An aldol
79. The reaction of Grignard reagent with aldehydes and ketones gives alcohols. This is known as .....
- (a) Nucleophilic addition reaction (b) Nucleophilic substitution reaction  
(c) Electrophilic substitution reaction (d) Electrophilic addition reaction

80. Osazone is formed by reaction of ..... moles of phenylthydrazine with monosaccharide  
 (a) 1 (b) 2 (c) 3 (d) 4
81. If a sugar contains..... fuction, it is a reducing sugar  
 (a) Hemiacetal (b) Acetal (c) Aldehyde (d) Ketal
82. Adverse effect of cerivastatin is .....  
 (a) Higher risk of rhabdomyolysis (b) Anaphylaxis  
 (c) Hepatic disorder (d) Hemolytic anemia
83. Following emigration from blood vesels, leucocyte migration to the site of infection or injury in mediated by  
 (a) Bradykinin (b) Chemokines and Complements C5a  
 (c) Histamine (d) Prostaglandins
84. In adults, drugs are an important cause of Fanconi's syndrome. Drugs that cause Fanconi's Syndrome include which group below. Select One  
 (a) Antiretroviral agents, aminoglycosides, glucocorticoids  
 (b) Tenofovir, outdated tetracycline, cisplatin  
 (c) Cidofovir, galactose supplements, NSAIDs  
 (d) Cyclosporin, Tenofovir, lamivudine
85. Which of the following is a type of phytoestrogen  
 (a) F (b) W (c) G (d) Y
86. Which aerosol particles will be deposited in alveoli  
 (a)  $>20 \mu\text{m}$  (b)  $<0.6 \mu\text{m}$  (c) 2 and 6  $\mu\text{m}$  (d) 1-2  $\mu\text{m}$
87. According to lipinski's rule of 5 , which of the following properties of drug molecules are likely to cause poor oral absorption  
 (a) A molecular weight lesser than 500 (b) A log P less than 5  
 (c) Less than 5 hydrogen bond donors (d) More than 10 hydrogen bond accepters
88. Polarographic method of analysis to obtain indivisual amonuts of  $\text{Cu}^{2+}$  and  $\text{Cd}^{2+}$  in a given mixture of the ions ( $\text{Cu}^{2+}$  and  $\text{Cd}^{2+}$ ) is achieved by measuring their.....  
 (a) Half way potentials (b) Migration currents  
 (c) Decomposition potentials (d) Diffusion currents
89. The most widely used agent for the treatment of acute gout arthritis is.....  
 (a) Indemethacin (b) Allopurinol  
 (c) Cokhicine (d) Probenecid
90. Which of the following actions of norepinephrine would be antagonized by prazosin but not by propranolol.  
 (a) Increased heart rate (b) Mydriasis  
 (c) Relases of rennin (d) Glycogenolysis
91. Arginine serves as a precursor for which of the vasodilatory product  
 (a) Bradykinin (b) Atrial natriuretic peptide  
 (c) Nitrous oxide (d) L- Citrulline

92. Which of the following is a test of digitoxose  
 (a) Keller Kiliani's (b) Kedde's reagent  
 (c) Raymond's reagent (d) Baljet's reagent
93. The Vd for phenytoin is 70 L and half life is 1.5 hours. What is the total clearance of phenytoin  
 (a) 34.32 L/h (b) 32.34 L/h  
 (c) 151.5 L/h (d) 51.51 L/h
94. Which of the following phytohormone usually acts as bud inhibitor  
 (a) Gibberlin (b) Cytokinin (c) Zeatin (d) Indole Acetic acid
95. What is the main different between HPLC and UPLC  
 (a) HPLC is reverse-phase whereas UPLC in normal-phase  
 (b) UPLC employs smaller stationary-phase particle size  
 (c) HPLC and UPLC employ different mobile phase  
 (d) HPLC and UPLC employ different detection methods  
 (e) HPLC operates at higher mobile phase pressures
96. Which drug is associated with hepatic/ renal toxic metabolite, N-acetyl-pbenzoquinone  
 (a) Diclofenac (b) Meclofenamate (c) Indomethacin (d) Acetaminophen
97. What is the percentage of chlorpromazine (pKa = 9.3) existing in ionized form in a solution of chlorpromazine hydrochloride at pH 7.4  
 (a) 98.76 (b) 1.24 (c) 0.32 (d) 99.68
98. Which of the following is a GLP-1 agonist  
 (a) Sitagliptin (b) Pramiltide (c) Exenatide (d) Eparlrestat
99. What is mechanism of aprotinin  
 (a) Inhibits Corboxypeptidase (b) Inhibits Plasminogen  
 (c) Inhibits plasmin (d) Inhibits plasminogen activator
100. Absolute alcohol is prepared from spirit by.....  
 (a) Distillation (b) Azeotropic distillation  
 (c) Fractional distillation (c) All of the above
101. Which of the following is interleukin agonist  
 (a) Aldesleukin (b) Rituximab (c) Anakinra (d) Etarecept
102. An extension of the normal pharmacological effects of a drug or its metabolite is termed as .....  
 (a) Type A ADR (b) Type B ADR (c) Type C ADR (d) Type D ADR
103. Which of the following parameters is/are important in determining bioequivalence  
 (a)  $T_{max}$  (b)  $C_{max}$  (c) AUC and  $C_{max}$  (d) None of these
104. What are known as balsams  
 (a) Resins dissolved in volatile oil (b) A mixture of volatile oils with sesquiterpenes  
 (c) Solidified resin devoid of volatile terpenes (d) Polysaccharide mixed with volatile oil
105. Sesquiterpenes are formed from ..... In the plants  
 (a) Farnesyl-pyrophosphate (b) Geranyl farnesyl pyrophosphate  
 (c) Coloring material (d) Degraded products of trierpenes
106. Which of the following is a type of phytoestrogen  
 (a) Lutein (b) Indoles  
 (c) Isothicotynates (d) Genistein

107. Attachment of polyethylene glycol (PEG) to proteins/ drugs do all of the following EXCEPT

- (a) Protect them from rapid hydrolysis or degradation
- (b) Improves micromole solubility
- (c) Increases absorption from the gut
- (d) Minimizing the uptake by the cells of the reticuloendothelial systems

108. Identify the harmful drug-drug interaction

- (a) Imipenem - Cilastatin
- (b) L-Dopa-Entacapone
- (c) Meperidine - Pargyline
- (d) Methotrexate - leucovorin

109. Synthesis of thyroid hormone is inhibited by all EXCEPT.....

- (a) Propyl thiouracil
- (b) Methimazole
- (c) Perchlorate
- (d) Diatrizoate

110. Choose correct statement for PEGylation:

- (a) Used to enhance In-vivo half-life of smaller Peptides and proteins
- (b) Avoidance of Reticulo-endothelial (RES) clearance
- (c) Reduce clearance rate through kidney
- (d) All

111. Which of the following is a common herbal remedy for insomnia

- (a) Milkthistle
- (b) Echinacea
- (c) Eucalyptus
- (d) Valerian

112. In which category of in vitro in vivo correlation the mean in vitro dissolution time is compared either to the mean residence time or to the mean in vivo dissolution time

- (a) A
- (b) B
- (c) C
- (d) D

113. What does the Hammett substituent constant ( $\sigma$ ) measure

- (a) The steric effect of a substituent
- (b) The electronic effect of a substituent
- (c) The hydrophobic effect of a substituent
- (d) The effect on pH of a substituent

114. Property exploited by electroanalytical technique of coulometry is.....

- (a) Electric potential
- (b) Electrical charge
- (c) Electrical current
- (d) Electrical resistance

115. All are true EXCEPT.....

- (a) Soft soaps give emulsions with a pH in the basic range
- (b) Hard soaps form water-in-oil emulsions
- (c) Water-soluble polymers favor the formation of water-in-oil (w/o) emulsions
- (d) On the HLB system, lower numbers are assigned to lipophilic compounds while higher numbers are assigned to hydrophilic compounds <http://www.xamstudy.com>

116. In callus culture, roots can be induced by the supply of.....

- (a) Auxin and no cytokinin
- (b) Higher concentration of auxin and lower concentration of cytokinin
- (c) Higher concentration of cytokinin and lower concentration of auxin
- (d) Auxin and cytokinin in equal proportions

117. Prostaglandin used in the treatment of postpartum hemorrhage is.....

- (a) Carboprost
- (b) Latanoprost
- (c) Bimatoprost
- (d) Travoprost



118. Identify 5HT<sub>3</sub> receptor antagonist which is 5HT<sub>4</sub> agonist also  
 (a) Metoclopramide (b) Cispride (c) Cilasetron (d) Graniseton
119. Which of the following AT-II receptor antagonists (SARTANs) does not possess tetrazole moiety in its structure  
 (a) Losartan (b) Irbesartan  
 (c) Telmisartan (d) Valsartan
120. What useful information can be found from a Van Deemter plot  
 (a) Optimum selectivity factor (b) Optimum mobile phase flow rate  
 (c) Optimum column temperature (d) The capacity factor
121. Brockman activity Scale' is used in the characterization of .....  
 (a) Stationary phase (b) Mobile Phase  
 (c) Buffer System used (d) Column specification
122. The FDA allows a maximum of ..... salicylic acid in commercial aspirin tablets  
 (a) 0.05 % (b) 0.1 % (c) 0.15% (d) 0.25 %
123. A phenolic acid compound isolated from the ripe fruits of myrobalan (karitaki).....  
 (a) Chebulic acid (b) Ferulic acid  
 (c) Emblicanin (d) Pivalic acid
124. Asafoetida \_Nitric acid gives.....  
 (a) Reddish-brown colour (b) Green colour  
 (c) Yellowish-orange colour (d) Blue fluorescence
125. Endocrine effects of antipsychotic like chlorpromazine include all of the following EXCERT  
 (a) Decrease in adrencorticotrophins, Decrease in gonadotrophins  
 (b) Decrease in release of pituitary growth hormone  
 (c) Increase in prolactin secretion  
 (d) Decrease in thyroid hormone production

**End of paper**

**ANSWER KEY GPAT 2013**

1-c	2-b	3-d	4-c	5-c	6-d	7-a	8-d	9-a	10-c
11-b	12-d	13-d	14-b	15-d	16-c	17-b	18-c	19-d	20-c
21-c	22-d	23-d	24-d	25-a	26-c	27-b	28-c	29-c	30-b
31-c	32-b	33-d	34-a	35-d	36-b	37-d	38-c	39-d	40-c
41-c	42-b	43-a	44-a	45-d	46-c	47-b	48-c	49-a	50-a
51-b	52-d	53-b	54-a	55-a	56-b	57-b	58-c	59-c	60-d
61-b	62-d	63-c	64-c	65-b	66-b	67-b	68-b	69-b	70-c
71-c	72-a	73-b	74-a	75-d	76-c	77-a	78-b	79-a	80-c
81-a	82-a	83-b	84-b	85-c	86-d	87-d	88-d	89-c	90-b
91-c	92-a	93-b	94-d	95-b	96-d	97-a	98-c	99-c	100-d
101-c	102-a	103-c	104-a	105-a	106-d	107-c	108-c	109-d	110-a
111-d	112-b	113-b	114-b	115-c	116-b	117-a	118-b	119-c	120-b
121-a	122-c	123-a	124-b	125-d					

# GPAT QUESTION PAPER 2012 WITH ANSWER KEY

## GPAT QUESTIONS

- Which of the following respective Phase-I and Phase-II reactions are the most common drug biotransformation reactions?  
(a) Oxidation and Glucuronidation (b) Reduction and Acetylation  
(c) Hydrolysis and Glucuronidation (d) Oxidation and Glutathion conjugation
- Which one of the following drugs has positive inotropic and negative chronotropic action  
(a) Dopamine (b) Epinephrine (c) Digoxin (d) Isoprenaline
- Which one of the following therapeutic classes has been proved clinically as a first line therapy for heart failure and has shown decreased hospitalization, improved symptoms and delayed disease progression?  
(a) Cardiac glycosides (b) ACE Inhibitors (ACEIs)  
(c) Renin Antagonists (d) Nitrites
- Which one of the following glucose transporters is the new drug target for the management of Type-2 diabetes mellitus?  
(a) Sodium glucose linked transporter-2 (SGLT2)  
(b) Glucose transporter-1 (GLUT1).  
(c) Sodium glucose linked transporter-1 (SGLT1)  
(d) Glucose transporter-2 (GLUT2)
- Which one of the following modes of HIV transmission carries highest relative risk of infection with single exposure?  
(a) Transfusion of blood and blood products  
(b) Perinatal - from mother to child  
(c) Sexual contacts with infected partners  
(d) Syringe sharing with drug addicts
- Which of the followings are the critical neurotransmitters playing major role in depression?  
(a) Acetylcholine, Norepinephrine and Dopamine  
(b) Dopamine, Norepinephrine and Serotonin  
(c) Serotonin, Dopamine and  $\gamma$ -amino butyric acid  
(d) Acetylcholine, Serotonin and  $\gamma$ -amino butyric acid
- A 55 years old man is under DOTS treatment for pulmonary tuberculosis for the last four months. Now, he has developed symptoms of peripheral neuritis. Which one of the followings Is the right addition to his therapy to manage peripheral neuritis?  
(a) Cyanocobalamin (b)  $\alpha$ -Lipoic acid (c) Pyridoxine (d) Prednisolone



8. What is the primary mechanism of action of local anesthetics
- Activation of ligand-gated potassium channels
  - Blockade of voltage-gated sodium channels
  - Stimulation of voltage-gated N-type calcium channels
  - Blockade of GABA-gated chloride channels
9. Which one of the following anti-asthmatic drugs can cause convulsions and arrhythmia
- Prednisolone
  - Salmeterol
  - Zafirlukast
  - Theophylline
10. Which one of the following anti-arrhythmic drugs acts by inhibiting potassium, sodium and calcium channels
- Quinidine
  - Lignocaine
  - Amiodarone
  - Flecainide
11. A 48 years old woman is having the symptoms of weight gain, cold intolerance, constipation, bradycardia, puffy face, lethargy and dry skin. These symptoms are suggestive of which of the followings?
- Over use of corticosteroid
  - Hypothyroidism
  - Estrogen deficiency
  - Over use of thyroxin sodium
12. Increased risk of hypoglycemia and weight gain is the common side effect of drugs used in the management of Type-2 diabetes mellitus. Followings are some commonly used drugs, alone or in combination, for the management of Type-2 diabetes mellitus:
- [P] : Metformin                      [Q]: Pioglitazone                      [R]: Glipizide                      [S] : Sitagliptin
- Choose the correct combination which is weight neutral and without risk of hypoglycemia.
- P and Q
  - Q and R
  - R and S
  - P and S
13. Which one of the following receptors is NOT a ligand-gated ion channel receptor
- Nicotinic Receptor
  - 5HT<sub>3</sub>- Receptor
  - GABA<sub>A</sub> - Receptor
  - H<sub>2</sub> -Receptor
14. Which one of the following classes of drugs causes side effects like dryness of mouth, tachycardia, urinary retention, constipation, blurring of vision, precipitation of glaucoma, drowsiness and impairment of cognition?
- Anti-adrenergic
  - Anti-cholinergic
  - Anti-serotonergic
  - Anti-dopaminergic
15. Which of the following cytokines are the most important regulators in inflammation and are the targets for anti-inflammatory agents used in rheumatoid arthritis
- Tumor necrosis factor-and interleukin-1.
  - Acetylcholine esterase and Eicosanoids
  - Leukotrienes and Isoprostanes
  - Adhesion factor and Monoamine oxidase A
16. Which one of the followings is a FALSE statement for competitive antagonists
- They have an affinity for the agonist binding site on receptor
  - They have no intrinsic activity
  - They cause parallel rightward shift of the control dose response curve
  - Maximum response of the agonist cannot be achieved in their presence by increasing the concentration of the agonist

18. Which one of the following drugs produces significant relaxation of both venules and arterioles  
(a) Hydralazine (b) Minoxidil (c) Diazoxide (d) Sodium nitroprusside

19. Antiviral action of purine analogues is primarily related to the followings:

[P] : Inhibition of RNA synthesis [Q] : Inhibition of DNA polymerase  
[R] : Immuno modulation [S] : Inhibition of viral penetration

Choose the correct option:

(a) R is correct and Q is incorrect (b) Q is correct and S is incorrect  
(c) P is correct and R is incorrect (d) S is correct and P is incorrect

20. All of the given four drugs are sympathomimetics:

[P] : Adrenaline [Q]: Isoprenaline [R] : Phenylephrine [S] : Noradrenaline

Choose the correct statement related to their effects on blood pressure.

(a) P and Q increase systolic and diastolic blood pressure  
(b) Q and R increase systolic and diastolic blood pressure  
(c) R and S increase systolic blood pressure  
(d) P and S increase systolic and diastolic blood pressure

21. All of the given four drugs are neuromuscular blocking agents.

[P] : Gallamine [Q]: Succinylcholine [R] : Vecuronium [S] : d-Tubocurarine

Choose the correct statement about them.

(a) P and Q are competitive neuromuscular blocking agents  
(b) Q and R are competitive neuromuscular blocking agents  
(c) R and S are non-competitive neuromuscular blocking agents  
(d) P and S are competitive neuromuscular blocking agents

22. Which one of the followings is a tyrosine kinase inhibitor indicated for a variety of malignancies

(a) Imatinib (b) Paclitaxel  
(c) Ezetimibe (d) Mitomycin

23. Which one of the followings is the most likely positive sign of pregnancy when detected in urine

(a) Estrogens  
(b) Progesterone  
(c) Human Chorionic Gonadotropin (HCG)  
(d) Corticotropic Hormone

24. Followings are some opioid analgesics:

[P] : Morphine [Q]: Pethidine [R]: Pentazocine [S] : Fentanyl

Choose the correct order of respiratory depressant propensity of these agents.

(a) P>Q>R>S (b) Q>P>R>S  
(c) R>P>Q>S (d) S>P>Q>R



33. The following characteristic properties are given in context of saponins:

[P] : Saponins give precipitate by shaking with water.

[Q] : Saponins are diterpenes and give foam on shaking with water.

[R] : Saponins are triterpenoidal compounds and cause haemolysis of erythrocytes.

[S] : They are steroidal or triterpenoidal compounds with tendency to reduce surface tension of water.

Choose the correct option.

(a) P is true; Q is true; R is true; S is true

(b) P is false; Q is true; R is false; S is true

(c) P is false; Q is true; R is true; S is true

(d) P is false; Q is false; R is true; S is true

34. Read the given statements about the constituents of Shellac:

[P] : Shellolic acid, a major component of alicyclic fraction is responsible for colour.

[Q]: Shellolic acid, a major component of aromatic fraction is responsible for colour.

[R] : Shellolic acid is a major component of aliphatic fraction and laccaic acid is a component of aromatic fraction.

[S] : Aliphatic components are shellolic acid which is alicyclic and lacauric acid which is acyclic, while laccaic acid is an aromatic colouring principle.

What is the correct combination of options?

(a) P is true; Q is true; R is true; S is true

(b) P is false; Q is false; R is false; S is true

(c) P is false; Q is false; R is true; S is true

(d) P is true; Q is false; R is false; S is true

35. Major component of *Cymbopogon citratus* is citral which is utilized commercially for the synthesis of vitamin A from the following:

[P] Directly from citral

[Q] By first converting to  $\Psi$ -ionone

[R] By first converting to  $\Psi$ -ionone followed by conversion to  $\alpha$ -ionone which is very important intermediate for carotenoid synthesis

[S] By first conversion of citral to T-ionone followed by conversion to  $\Psi$ -ionone which is an important intermediate for carotenoid synthesis

(a) P is true; Q is true; R is true; S is true

(b) P is false; Q is true; R is false; S is true

(c) P is false; Q is false; R is true; S is true

(d) P is false; Q is false; R is false; S is false

36. Which one of the following constituents is reported to have anti-hepatotoxic activity

(a) Podophyllotoxin

(b) Andrographoloid

(c) Linalool

(d) Safranal

37. Geranial and Neral are the monoterpene aldehyde constituents of volatile oil. Read the following statements about them:

[P] : Geranial and Neral are both optical isomers

[O] : Geranial and Neral are both geometric isomers

[R] : Geranial has Z configuration and Neral has E configuration

[S] : Geranial has E configuration and Neral has Z configuration

(a) Choose the correct combination of answers for them.

(b) P is false; Q is true; R is true; S is false

(c) P is true; Q is false; R is true; S is true

(d) P is false; Q is true; R is false; S is false

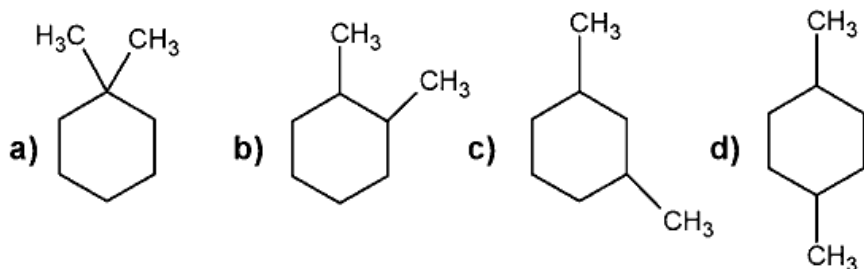


38. Identify the incorrect statement applicable to lignans.
- Lignans are formed by the dimerization of the phenylpropane moiety
  - Podophyllotoxin can be termed phytochemically as a lignan
  - Lignans can be formed by cyclization of phenylpropane nucleus
  - Lignans are the secondary metabolites formed from the Shikimic acid pathway
39. Naringin, obtained from orange peel, can be named as one of the followings. Identify the correct name.
- 5,4'-Dihydroxy-7-rhamnoglucoside of flavanone
  - 5,4'-Dihydroxy-7-glucoside of flavanone
  - 5,3,4'-Trihydroxy-7-rhamnoglucoside of flavone
  - 5,3,4'-Trihydroxy-7-glucoside of flavones
40. Rhizomes of *Zingiberofficinale* contain some sesquiterpene hydrocarbons. Some hydrocarbons are given below:
- [P] :  $\beta$ -Bisabolene      [Q]: Gingerone A      [R] : Gingerol      [S]: Zingiberene
- Identify the correct pair of constituents present in the rhizomes.
- P and S
  - P and Q
  - Q and S
  - Q and R
41. Listed below are the chemical tests used to identify some groups of phytoconstituents. Identify the test for the detection of the purine alkaloids.
- Keller-Killani Test
  - Murexide Test
  - Shinoda Test
  - Vitali-Morin Test
42. Given below are four statements in context of Hecogenin:
- [P] : It is a saponin  
 [Q]: It is useful for the semi-synthesis of steroidal drugs  
 [R] : It is not a glycoalkaloid  
 [S] : It is obtained from *Dioscorea* tubers
- Choose the correct combination of statements.
- P, Q and R are correct while S is incorrect
  - P, Q and S are correct while R is incorrect
  - Q R are correct while P, S are incorrect
  - All are correct statements
43. Atropine biosynthesis involves a pair of precursors. Identify the correct pair.
- Ornithine and Phenylalanine
  - Tyrosine and Tryptophan
  - Tryptophan and Dopamine
  - Tyrosine and Dopamine
44. Study the following statements:
- [P] : Lutein and zeaxanthin are flavonoids  
 [Q]: Lutein and zeaxanthin are xanthophylls  
 [R] : Lutein and zeaxanthin are required to control age-related macular degeneration  
 [S] : Lutein is a flavonoid while zeaxanthin is its glycoside
- Choose the correct answer.
- P is correct while Q, R and S are incorrect
  - Q and R are correct while P and S are incorrect
  - Statement P is the only correct statement
  - Statement S is the only correct statement

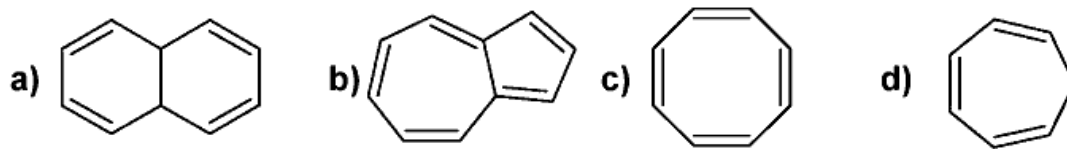
45. Listed below are some phytoconstituents.  
 [P] : Galactomannan  
 [Q]: Glucomannan  
 [R]: Barbaloin  
 [S] : Phyllanthin Identify the constituent(s) present in Aloe vera.  
 (a) Only P (b) Q and R (c) Only S (d) P and S
46. Choose the correct answer for the binomial nomenclature of fruits of star-anise.  
 (a) *Pimpinella anisum* (b) *Illicium verum*  
 (c) *Illicium anisatum* (d) *Illicium religiosum*
47. Given herewith are two statements:  
 [P]: Digitoxin is a secondary glycoside from *Digitalis purpurea*  
 [Q]: Digitoxin is a partially hydrolysed glycoside of *Purpurea glycoside A*  
 Determine the correctness of the above statements.  
 (a) Both P and Q are true (b) P is true but Q is false  
 (c) Both P and Q are false (d) P is false but Q is true
48. Peruvoside is naturally obtained from one of the following plants. Identify the correct name.  
 (a) *Dioscorea* (b) Ginseng (c) Liquorice (d) *Thevetia*
49. One of the followings is NOT required for the initiation and maintenance of plant tissue culture. Identify that  
 (a) Sucrose (b) Kinetin (c) Auxin (d) Absicic acid
50. Study the relationship between the given two statements:  
 [P]: Capsanthin is a red coloured principle from *Capscium annum*  
 [Q]: Capsanthin is a vanillylamide of isodecenoic acid  
 Choose the correct answer:  
 (a) Both P and Q are correct (b) Both P and Q are incorrect  
 (c) P is correct but Q is incorrect (d) P is incorrect but Q is correct
51. For the equation  $PV = nRT$  to hold true for a gas, all of the following conditions are necessary EXCEPT for ONE. Identify that  
 (a) The molecules of gas must be of negligible volume  
 (b) Collisions between molecules must be perfectly elastic  
 (c) The velocities of all molecules must be equal  
 (d) The gas must not be decomposing
52. Atracurium besylate, a neuromuscular blocking agent, is metabolized through one of the following reactions. Identify that  
 (a) Hoffman elimination (b) Hoffman rearrangement  
 (c) Michael addition (d) Claisen condensation



53. Identify the metabolite of prontosil responsible for its antibacterial activity.
- (a) Sulphacetamide (b) Sulphanilamide  
(c) p-Amino benzoic acid (d) Probenecid
54. The central bicyclic ring in penicillin is named as one of the followings. Find the correct name.
- (a) 1-Thia-4-azabicyclo[3.2.1]heptanes (b) 4-Thia-1-azabicyclo[3.2.0]heptane  
(c) 4-Thia-1-azabicyclo[3.2]heptanes (d) 1-Thia4-azabicyclo[1.2.3]heptanes
55. Both of the CMR and PMR spectra of an unknown compound show four absorption peaks each. Identify the unknown compound



56. Out of the four given compounds choose the one which is aromatic



57. Quantification of minute quantity of a drug from a complex matrix, without prior separation can be done using one of the following techniques. Identify that
- (a) Coulometry (b) Potentiometry  
(c) Fluorescence spectroscopy (d) Radioimmunoassay
58. Which one of the following fragmentation pathways involves a double bond and hydrogen in mass spectrometry
- (a)  $\alpha$ -Fission (b)  $\beta$ 1- Fission  
(c) Mc-Lafferty rearrangement (d) Retro-Diel's Alder rearrangement
59. Read the following statements carefully about non-aqueous titrations:

[P]: Acetate ion is the strongest base capable of existence in acetic acid.

[Q]: Mixtures of bases of different strengths can be analyzed by selecting a differentiating solvent for the bases.

[R] : Acetic acid acts as a leveling solvent for various acids like perchloric and hydrochloric acids.

[S] : Mixtures of bases of different strengths can be analyzed by selecting a leveling solvent for the bases.

Choose the correct answer.

- (a) P and Q are true and R and S are false  
(b) P and S are true and R and Q are false  
(c) R and Q are true and P and S are false  
(d) R and S are true and P and Q are false

60. Read the following statements carefully about Volhards method:  
 [P] : In Volhard's titration, silver ions are titrated with thiocyanates in acidic solution  
 [Q]: Ferric ions act as indicator in Volhard's method, yielding reddish brown ferric thiocyanate  
 [R] : Volhard's method is used to determine halides  
 [S] : Volhard's method is a dect titration  
 Choose the correct set of answers.  
 (a) P, Q and R are true and S is false                      (b) Q, R and S are true and P is false  
 (c) R, S and P true and Q is false                          (d) P, Q R and S all are true
61. Identify the group of enzymes that utilizes NADP or NAD as coenzymes and catalyzes biochemical reactions by the transfer of electrons from one molecule to another.  
 (a) Isomerases                      (b) Oxidoreductases                      (c) Transferases                      (d) Ligases
62. Glucose is the only source of energy for one of the followings. Identify that.  
 (a) Cardiac cells                      (b) Nephrons                      (c) RBCs                      (d) Thrombocytes
63. Determine the correctness or otherwise of the following Assertion [a] and Reason [r]: Assertion [a] : Halogens are unusual in their effect on electrophilic aromatic substitution; they are deactivating yet ortho-, para - directing. Reason [r] : In electrophilic aromatic substitution reactions, reactivity is controlled by stronger inductive effect while orientation is controlled by the stronger hyperconjugation effect.  
 Choose the correct statement  
 (a) [a] is true but [r] is false  
 (b) Both [a] and [r] are true and [r] is the correct reason for [a]  
 (c) Both [a] and [r] are false  
 (d) Both [a] and [r] are true but [r] is NOT the correct reason
64. Given are the four statements about dehydration of alcohols to give alkenes:  
 [P]: Ease of dehydration of alcohols takes place in the order  $3^\circ > 2^\circ > 1^\circ$ .  
 [Q]: Dehydration is acid catalyzed.  
 [R]: Orientation of the alkene formed is strongly Saytzeff.  
 [S]: Dehydration is irreversible.  
 Choose the correct combination of statements.  
 (a) P and Q are correct while R and S are not                      (b) P, Q and R all three are correct but S is not  
 (c) P, Q, R and S all are correct                      (d) P, Q and S all three are correct but R is not
65. Choose the correct statement regarding the synthesis of phenyl n-propyl ether.  
 (a) Phenyl n-propyl ether is prepared from n-propyl bromide and sodium phenoxide  
 (b) Phenyl n-propyl ether is prepared from bromobenzene and sodium n-propoxide  
 (c) Phenyl n-propyl ether can be prepared by either of the two methods  
 (d) Both (a) and (b) are not the correct methods for the synthesis of phenyl n-propyl ether

66. Read the following statements about SN1 reactions:

[P] : They proceed with complete inversion (Walden inversion).

[Q] : They proceed with racemization plus some net inversion.

[R] : They are characterized by rearrangements.

[S] : They *are* characterized by the reactivity sequence,  $\text{CH}_3 > 1^\circ > 2^\circ > 3^\circ$

Choose the correct combination?

(a) P and Q are true while R and S are false

(b) P and R are true while S and Q are false

(c) Q and R are true while P and S are false

(d) R and S are true while P and Q are false

67. Read the following statements carefully:

[P] : Pyrrole and thiophene undergo electrophilic aromatic substitution reactions much faster than benzene

[Q] : Pyrrole and thiophene undergo Diels Alder addition reaction very fast

[R] : Pyrrole and thiophene undergo nucleophilic aromatic substitution reaction faster than benzene

[S] : Pyrrole is a pi excessive system while thiophene is a pi deficient system

Choose the correct combination of statements.

(a) Q only is true while P, R and S are false

(b) R and S are true while P and Q are false

(c) P and R are true while Q and S are false

(d) P only is true while Q, R and S are false

68. Among the followings which one is not only a non-reducing sugar but also does not exhibit mutarotation?

(a) Glucose

(b) Maltose

(c) Lactose

(d) Sucrose

69. Choose the most basic heterocyclic compound among the followings.

(a) Pyridine

(b) Imidazole

(c) Pyrrole

(d) Pyrrolidine

70. Followings are some drug derivatives used to increase/decrease the water solubility of the parent drugs:

[P] : Rolitetracycline

[Q] : Erythromycin lactobionate

[R] : Chloramphenicol succinate

[S] : Erythromycin stearate

Choose the correct combination of statements.

(a) Q and R are used to increase water solubility while P and S are used to decrease it

(b) P, Q and R are used to increase water solubility while S is used to decrease it

(c) Q, S and R are used to increase water solubility while P is used to decrease it

(d) Q and S are used to increase water solubility while P and R are used to decrease it

71. Study the following statements on prevention of crystalluria. By the given approaches crystalluria can be prevented

[P] : By co-administration of sulfadiazine, sulfamerazine and sulfamethazine

[Q] : By increasing the pH of urine

[R] : By co-administration of sulphaniamide, sulphamethoxazole and folic acid

[S] : By administration of co-trimoxazole

Choose the correct combination of statements.

(a) P and Q are correct

(b) R and S are correct

(c) P and R are correct

(d) Q and R are correct

72. Progesterone is obtained from diosgenin through the following sequence of chemical reactions:

[P] : Acetylation,  $\text{CrO}_3$  (oxidation), Acetolysis,  $\text{H}_2/\text{Pd}$ , Hydrolysis and Oppenauer oxidation

[Q] : Oppenauer oxidation, Acetylation,  $\text{CrO}_3$  (oxidation), Acetolysis,  $\text{H}_2/\text{Pd}$  and Hydrolysis

[R] :  $\text{CrO}_3$  (oxidation), Acetolysis, Acetylation, Oppenauer oxidation, Hydrolysis and  $\text{H}_2/\text{Pd}$

[S] : Acetylation,  $\text{H}_2/\text{Pd}$ , Hydrolysis,  $\text{CrO}_3$  (oxidation), Oppenauer oxidation and Acetolysis

Choose the correct sequence of reactions.

(a) P

(b) Q

(c) R

(d) S

73. Following statements are given for local anaesthetic drug lidocaine:

[P] : It contains a xylidine moiety

[Q]: It can be used as antiarrhythmic agent on oral administration.

[R] : When administered along with adrenaline its toxicity is reduced and its effect is prolonged

[S] : Chemically it is 2-diethylamino-2',6'-dimethylphenyl acetamide

Choose the correct combination of statements.

(a) P, Q and S

(b) P, Q and R

(c) P, R and S

(d) Q, R and S

74. One of the following ring systems can be used as the bioisosteric replacement for benzene ring in drug design:

[P]: Thiophene

[Q]: Cyclohexa-1,3-diene

[R]: Pyrrolidine

[S]: Imidazoline

Identify the correct answer. –

(a) P

(b) Q

(c) R

(d) S

75. Some of the following statements describe the properties of Dropping Mercury Electrode (DME) correctly:

[P] Constant renewal of electrode surface eliminates poisoning effects.

[Q] Mercury makes many metal ions easily reducible.

[R] Mercury has large hydrogen over-voltage.

[S] The electrode can get oxidised with ease.

Identify the correct combination.

(a) All statements P, Q, R and S are correct

(b) Statements P, Q and R only are correct

(c) Statements P, R and S only are correct

(d) Statements P, Q and S only are correct

76. Penicillin ring system is derived from two of the following amino acids:

[P] : Alanine and methionine

[Q] : Cysteine and valine

[R] : Glycine and cysteine

[S] : Methionine and leucine

Choose the correct pair.

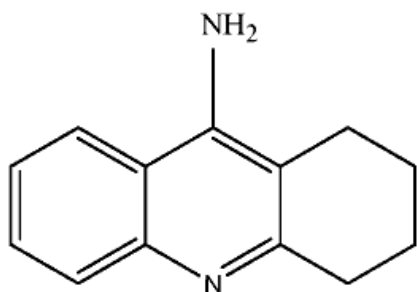
(a) P

(b) Q

(c) R

(d) S

77. For the management of which disease the given drug tacrine is used? Identify.



(a) Glaucoma

(b) Antidote for aticholinesterase poisoning

(c) As an insecticide

(d) Alzheimers disease

78. Low dose aspirin acts as anti-platelet aggregating agent by which one of the following mechanisms? Find the correct answer

(a) It acts as a suicide substrate for COX-1 enzyme present in platelets

(b) It acts as a transition state analog for COX-2 enzyme present in the platelets

(c) It acts as a reversible inhibitor of lipoxigenase present in the platelets

(d) It acts as an affinity label of oxidoreductases present in the platelets



79. Some statements are given for clavulanic acid, sulbactam and tazobactam:

[P] : All three lack the 6-acylamino side chain

[Q]: All are potent inhibitors of the enzyme  $\beta$ -lactamase

[R] : All are prodrugs of penicillin

[S] : All have weak antibacterial activity

Choose the correct combination of statements.

(a) P, Q and R are true while S is false                      (b) Q, R and S are true while P is false

(c) P, R and S are true while Q is false                      (d) P, Q and S are true while R is false

80. Electrophilic aromatic substitution reactions in indole give one of the following products preferably.

Identify that

(a) 3-Substituted indole    (b) 2-Substituted indole

(c) 5-Substituted indole    (d) 6-Substituted indole

81. Which one of the following species is an intermediate in the reaction shown below



(a)  $+\text{CH}_2\cdot\text{CH}_2\cdot\text{CHO}$     (b)  $-\text{CH}_2\cdot\text{CH}_2\cdot\text{CHO}$

(c)  $\text{CH}_3\cdot+\text{CH}\cdot\text{CHO}$     (d)  $\text{CH}_3\cdot-\text{CH}\cdot\text{CHO}$

82. Which detector is used in gas chromatography for halogen containing compounds specifically

(a) Katharometer    (b) Electron capture detector

(c) Flame ionization detector                                      (d) Thermal conductivity detector

83. Precessional frequency of a nucleus depends on the followings:

[P] : Quantum of externally applied magnetic field      <http://www.xamstudy.com>

[Q] : Quantum of electron density present around the nucleus

[R]: Frequency of applied electromagnetic radiations

[S] :Electronegativity of the element

Choose the correct combination of statements.

(a) P&Q are true                      (b) P&R are true                      (c) Q&R are true                      (d) P&S are true

84. Some statements are given about disodium edetate:

[P] : Disodium edetate is a bidentate ligand

[Q] : Disodium edetate is a complexing agent but not a chelating agent

[R]: Disodium edetate can be used for the assay of lithium carbonate

[S] : Disodium edetate can be used for the assay of zinc sulphate

Choose the correct answer.

(a) Q,R&S are true                      (b) Q&S are true                      (c) S only is true                      (d) P, Q, R & S all are true



85. Which one of the following amino acids is the most effective contributor of protein buffer?  
 (a) Alanine                      (b) Glycine                      (c) Histidine                      (d) Arginine
86. Given are some statements about cycloalkanes:  
 [P] : Bayer's theory does not apply to four membered rings.  
 [Q]: Cyclohexane and cyclodecane rings are not flat but are puckered.  
 [R]: Chair form of cyclohexane experiences van der Waals strain due to flagpole interactions.  
 [S] : Boat form of cyclohexane experiences both torsional and van der Waals strain.  
 Choose the correct combination of statements.  
 (a) P, Q & R are true and S is false                      (b) Q & S are true and P & R are false  
 (c) P, Q& S are true and R is false                      (d) Q, R & S are true and P is false
87. Phenols are more acidic than alcohols. This is due to one the following reasons. Identify that.  
 (a) Alkoxide ions are better stabilized by the electron releasing alkyl groups  
 (b) Resonance stabilizes both phenols and phenoxide ions to the same extent  
 (c) Phenols are better stabilized than the phenoxide ions while reverse is true for alcohols and alkoxides  
 (d) Phenoxide ions are much better stabilized than the alkoxide ions
88. Study the following statements on alkylating agents as antineoplastics:  
 [P] : They get converted to aziridinium ions and bind to 7th position -N atom of guanine of DNA base pairs  
 [Q]: Nitrogen mustards and Sulfur mustards belong to this class of drugs  
 [R] : They inhibit dihydrofolate reductase enzyme thereby inhibiting DNA synthesis  
 [S] : They chelate electropositive atoms present in the DNA thereby inhibiting DNA uncoiling  
 Choose the correct combination of statements.  
 (a) P and Q are correct                      (b) R and S are correct  
 (c) P and S are correct                      (d) Q and R are correct
89. Study the following statements about the stereochemistry of steroidal aglycones in cardiac glycosides:  
 [P]: Rings A-B and C-D are cis fused while B-C is trans fused.  
 [Q]: Rings A-B and C-D are trans fused while B-C is cis fused.  
 [R]: Rings A-B are trans fused while B-C and C-D are cis fused.  
 [S]: Rings A-B are cis fused while B-C and C-D are trans fused.  
 Choose the correct statement  
 (a) P is true while Q, R and S are false                      (b) Q is true while P, R and S are false  
 (c) R is true while P, Q and S are false                      (d) S is true while P, R and Q are false

90. Following are some statements about Captopril:

[P] : It is a prototype molecule in the design of ACE inhibitors

[Q]: It contains a sulphonyl group in its structure

[R]: It has a proline moiety in its structure

[S] : It has an ester linkage

Choose the correct combination of statements.

(a) P & Q are true while R & S are false      (b) Q & R are true while P & S are false

(c) P & R are true while Q & S are false      (d) R & S are true while P & Q are false

91. Cetirizine as an antihistaminic agent has a low sedative potential due to one of the following reasons. Identify that.

(a) It has a chiral center      (b) It has high log P value

(c) It has high polarity      (d) It has low molecular weight

92. There are some criteria which an ideal antacid should fulfill. Some of them given below:

[P] : The antacid should be absorbable orally and should buffer in the pH range of 4 - 6

[Q]: The antacid should exert its effect rapidly and should not cause a large evolution of gas

[R] : The antacid should not be a laxative or should not cause constipation

[S] : The antacid should react with the gastric acid and should inhibit pepsin

Choose the correct combination of criteria for an ideal antacid.

(a) P, Q&R      (b) Q, R&S      (c) Q&R      (d) R & S

93. Titanium dioxide is used in sun screen products as a topical protective. The topical protective effect of titanium dioxide is arising due to one of the following properties. Identify that.

(a) It has a high bulk density      (b) It has a high LW absorptivity

(c) It has a low water solubility      (d) It has a high refractive index

94. Deferoxamine is used for the treatment of toxicity caused by one of the following ions. Identify that.

(a) Arsenic      (b) Cyanide      (c) Iron      (d) Lead

95. Parachor and Molar refraction can be categorized under one of the following properties. Identify that.

(a) Additive properties      (b) Constitutive properties

(c) Colligative properties      (d) Additive and constitutive property

96. East's camphor method is used for determination of molecular weight of solutes which are soluble in molten camphor. The basic principle of the method is dependent on one of the following properties. Identify that.

(a) Elevation of freezing point of camphor by the solute

(b) Lowering of vapour pressure of camphor by the solute

(c) Lowering of freezing point of camphor by the solute

(d) Elevation of boiling point of camphor by the solute

97. In polarography, when the limiting current is achieved, one of the following processes takes place. Choose that

- (a) The rate of electron transfer just matches the rate of mass transfer
- (b) The rate of electron transfer is slower than the rate of mass transfer
- (c) The rate of electron transfer becomes independent of the rate of mass transfer
- (d) The rate of electron transfer far exceeds the rate of mass transfer

98. Starch-iodide paste/paper is used as an external indicator in one of the following titrations. Identify that

- (a) Iodometric titration of copper sulphate using sodium thiosulphate as titrant
- (b) Iodimetric titration of ascorbic acid using iodine solution as titrant
- (c) Diazotisation titration of sulphadiazine using Sodium nitrite as titrant
- (d) Potassium dichromate titration using sodium thiosulphate as titrant

99. For a dye to be used as metal indicator in complexometric titrations, some of the dye properties are listed below:

[P] : The dye should have distinct colour than the dye-metal complex

[Q]: The dye-metal complex should have a higher stability than the metal-chelate (titrant) complex

[R] : The dye should be capable of complexing with the metal ions

Choose the correct combination of statements for the dye to be used as an indicator in complexometric titrations.

- (a) P & Q are correct while R is not
- (b) Q & R are correct while P is not
- (c) P & R are correct while Q is not
- (d) P, Q & R all are correct

100. In amperometry, rotating platinum electrode (RPE) is used as indicating electrode. It has certain advantages as well as disadvantages. Read the following statements about the use of rotating platinum electrode in amperometry:

[P] : It causes large diffusion current due to rotation resulting in greater mass transfer

[Q]: It causes greatly reduced residual current due to lack of condenser effect

[R] : It has a low hydrogen over potential

Choose the correct combination of statements.

- (a) P, Q & R are all advantages of using RPE in amperometry
- (b) P & R are advantages of RPE while Q is a disadvantage
- (c) Q & R are advantages of RPE while P is a disadvantage
- (d) P & Q are advantages of RPE while R is a disadvantage

101. What will be the approximate  $T_{max}$  of a drug exhibiting  $K_a$  of  $2 \text{ hr}^{-1}$  and  $K$  of  $0.2 \text{ hr}^{-1}$ ?

- (a) 1.2 hr
- (b) 2.4 hr
- (c) 4.8 hr
- (d) 2.0 hr

102. There are some statements related to the protein binding of drugs as given below:

[P] : Protein binding decreases the free drug concentration in the system.

[Q]: Protein binding to plasma albumin is an irreversible process.

[R] : Drugs with a low lipophilicity have a high degree of protein binding.

[S] : Protein binding of one drug can be affected by the presence of other drug.

Choose the correct combination of statements.

(a) P & Q are true while R & S are false

(b) Q & R are true while P & S are false

(c) R & S are true while P & Q are false

(d) P & S are true while Q & R are false

103. Based on Henderson-Hasselbalch equation, at what pH value a weak acid would be 99.9% ionized

(a) At pH equivalent to  $pK_a + 3$

(b) At pH equivalent to  $pK_a - 3$

(c) At pH equivalent to  $pK_a - 1$

(d) At pH equivalent to  $pK_a + 1$

104. Some statements about crystals are given below:

[P] : The crystal lattice is constructed from repeating units called unit cells.

[Q]: The external appearance of a crystal is described by crystal habits, such as needles, prisms, rosettes etc.

[R] : Polymorphism is the ability of a compound to crystallize as more than one distinct crystalline species with different internal lattice.

[S] : Hydrates are always more soluble than anhydrous form of the same drug

Choose the corrected combination of statements about crystals.

(a) Statement P, Q and S are correct but R is wrong

(b) Statement P, Q and R are correct but S is wrong

(c) Statement Q, R and S are correct but P is wrong

(d) Statement R, S and P are correct but Q is wrong

105. Which one of the followings is NOT used in preparation of baby powders

(a) Stearic acid

(b) Boric acid

(c) Kaolin

(d) Calcium carbonate

106. According to Kozeny Carmen equation a 10% change in porosity can produce:

(a) Two fold change in viscosity

(b) Five fold change in viscosity

(c) Three fold change in viscosity

(d) None of the above

107. Speed disk atomizer rotates at a speed of:

(a) 3000 - 5000 revolutions per mm

(b) 3000 - 50000 revolutions per mm

(c) 300 - 50000 revolutions per mm

(d) 300 - 5000 revolutions per mm

108. The thickness Gold coating on a USP Dissolution apparatus - I basket should be:

(a) Not more than  $2.5 \mu$  in thickness

(b) Not more than 0.001 mm in thickness

(c) Not more than  $0.025 \mu$  in thickness

(d) Not more than 0.1 mm in thickness





114. Choose the correct formula for the calculation of the retail price of a formulation, given by the Govt of India.

(a)  $R.P. = (M.C. + E.D. + P.M. + P.C.) \times (1 + MAPE/100) + C.C.$

(b)  $R.P. = (M.C. + C.C. + P.M. + P.C.) \times (1 + MAPE/100) + E.D.$

(c)  $R.P. = (M.C. + C.C. + E.D. + P.C.) \times (1 + MAPE/100) + P.M.$

(d)  $R.P. = (M.C. + C.C. + P.M. + E.D.) \times (1 + MAPE/100) + P.C.$

115. Determine the correctness or otherwise of the following Assertion [a] and the Reason [r]:

Assertion [a] In arsenic poisoning, dimercaprol, injected intramuscularly, acts as antidote by metal complexation.

Reason [r] : EDTA acts as an antidote in lead poisoning, by solubilizing the toxic metal ions from the tissues.

(a) Although [a] is true but [r] is false

(b) Both [a] and [r] are false

(c) Both [a] and [r] are true and [r] is the correct reason for [a]

(d) Both [a] and [r] are true but [r] is NOT the correct reason for [a]

116. Determine the correctness or otherwise of the following Assertion [a] and the Reasons [r]

Assertion [a] : Butylated hydroxytoluene is added as one of the ingredients in the lipstick formulation.

Reason [r] : It is a good solvent for the wax - oil mixtures and coloring pigments present in the lipstick.

Reason [s] It is an antioxidant and prevents rancidity on storage.

(a) [a] is true, and [r] and [s] are true and correct reasons for [a]

(b) [a], [r] and [s] are all false

(c) [a] is true, [s] is false, and [r] is the correct reason for [a]

(d) [a] is true, [r] is false, and [s] is the correct reason for [a]

117. Which one of the following statements is FALSE about Interferons?

(a) Interferons are cellular glycoproteins produced by virus infected cell

(b) Interferons have no effects on extracellular virus

(c) Interferons are virus specific agents that can interfere either with DNA or RNA virus

(d) They are produced as potent broad spectrum antiviral agents

118. In relation to sodium chloride and water mixture, read the following statements:

[P] : Mixture is eutectic in nature

[Q]: It has eutectic point  $-21.2^{\circ}\text{C}$

[R]: The composition of eutectic is 25.3% by Mass

[S] : The mixture is a true eutectoid and may exist as peritectic also.

Which of the set of statements is correct?

(a) P&Q

(b) Q, R&S

(c) P, Q&S

(d), P, R & S





127. Which one of the followings would be an offence in accordance with the provisions of the Drugs and Cosmetics Act, 1940?

- (a) Packing of Paediatric oral drops in 30 ml pack
- (b) Packing of Oxytocin injection in a single unit blister pack
- (c) Packing of Schedule X drugs in 5 ml injection pack
- (d) Packing of Aspirin tablets (75 mg) in 14 tablet strip pack

128. Which one of the following colours is NOT permitted to be used in drugs by the Drugs and Cosmetics Act, 1940?

- (a) Chlorophyll
- (b) Riboflavin
- (c) Tartrazine
- (d) Amaranth

129. At equal concentrations which one of the following mucilages will possess maximum viscosity?

- (a) Maize starch
- (b) Rice starch
- (c) Wheat starch
- (d) Potato starch

130. By which mechanism the microorganisms are killed by autoclaving?

- (a) Coagulation of the cellular proteins of the microorganisms
- (b) Alkylation of essential cellular metabolites of microorganisms
- (c) Stopping reproduction of microorganism cells as a result of lethal mutations
- (d) Oxidation of RNA of microorganisms

131. Manufacture and sale of some of the following drugs is prohibited in India:

[P] : Fixed dose combination of atropine and antidiarrhoeals

[Q]: Penicillin eye ointment

[R]: Nimesulide paediatric drops

[S] : Gatifloxacin tablets

Choose the drugs which are prohibited?

- (a) P,Q&R
- (b) Q,S&R
- (c) R,S&P
- (d) P,Q,R&S

132. Following are the phases of clinical trials:

[P] : Human pharmacology

[Q]: Therapeutic confirmatory trials

[R] : Post marketing trials

[S] : Therapeutic exploratory trials

Choose the correct order of phases of clinical trial.

- (a) P,Q,R,S
- (b) P,R,Q,S
- (c) P,Q,S,R
- (d) P,S,Q,R

133. The integrity of seals in case of vials and bottles is determined by some tests. Some of them are given below:

[P]: Leaker's test

[Q]: Water hammer test

[R]: Spark tester probe

Choose the correct answer.

- (a) P & Q
- (b) Q&R
- (c) P&R
- (d) P,Q & R

134. Study the following four statements:

[P] : Gram negative bacteria produce potent pyrogenic substances called endotoxins

[Q]: Ethylene oxide mixed with carbon dioxide or fluorinated hydrocarbons is used in gas sterilization

[R]: D value is the time (for heat or chemical exposure) or the dose (for radiation exposure) required for the microbial population to decline by one logarithmic unit

[S]: Spores of *Geobacillus stearothermophilus* (*Bacillus stearothermophilus*) are used for sterility testing of moist heat sterilization process

Choose the correct answer.

(a) P, Q & R are correct but S is incorrect

(b) Q, R & S are correct but P is incorrect

(c) R, S & P are correct but Q is incorrect

(d) P, Q, R & S all are correct

135. Read the following statements:

[P] : The surface area measurement using BET approach utilizes argon gas for adsorption

[Q]: Full form of BET is Brunauer, Emmett and Teller

Choose the correct answer.

(a) P&Q both are correct

(b) P is correct but Q is incorrect

(c) Q is correct but P is incorrect

(d) Both P & Q are incorrect

136. Based on the DLVO theory of force of interaction between colloidal particles, which one of the followings lead to attractive interaction between two particles? <http://www.xamstudy.com>

(a) Solvation forces

(b) Electrostatic forces

(c) van der Waals forces

(d) Steric forces

137. Read the following statements with regard to viscosity of a polymer solution:

[P] : Specific viscosity of a polymer solution is obtained as relative viscosity + 1

[Q]: Relative viscosity is the ratio of the viscosity of the solution to the viscosity of pure solvent

[R]: Kinematic viscosity is defined as the viscosity of the liquid at a definite temperature

[S] : The unit for kinematic viscosity is poise or dyne sec cm<sup>-2</sup> Indicate the correct combination of statements.

(a) P & S are correct but Q&R are wrong

(b) Q & R are correct but P & S are wrong

(c) P & Q are correct but R & S are wrong

(d) R & S are correct but P & Q are wrong

138. Determine the correctness or otherwise of the following Assertion [a] and the Reason [r]

Assertion [a] : Salts having no ions in common with the slightly soluble electrolyte increase its solubility

Reason [r] : Such salts lower the activity coefficient of the slightly soluble electrolyte

(a) Both [a] and [r] are true and [r] is the correct reason for [a]

(b) Both [a] and [r] are false

(c) Although [a] is true but [r] is false

(d) Both [a] and [r] are true but [r] is NOT the correct reason for [a]

139. What negative adsorption would do

- (a) Decrease the surface free energy as well as the surface tension
- (b) Increase the surface free energy as well as the surface tension
- (c) Decrease the surface free energy but increase the surface tension
- (d) Increase the surface free energy but decrease the surface tension

140. Read the following statements:

- [P] : At temperature below Kraft point, micelles will, not form
- [Q]: At Kraft point, solubility of surfactant equals CMC
- [R] : Kraft point increases with increasing chain length of hydrocarbon
- [S] : Kraft point is normally exhibited by non-ionic surfactants

Choose the correct combination of answers.

- (a) P is correct but Q, R & S are wrong
- (b) R & S are correct but P& Q are wrong
- (c) P, Q & R are correct but S is wrong
- (d) All correct

141. Two statements are given regarding the uniformity of dispersion test (LP):

- [P] : It Is evaluated using 6 tablets and 500 mL water
- [Q]: It involves measuring the dispersion time of each tablet

Choose the correct set of statements.

- (a) P is correct while Q is incorrect
- (b) P & Q both are correct
- (c) P is incorrect while Q is correct
- (d) Both P & Q are incorrect

142. Read the following statements:

- [P] : Caramelization occurs in acidic conditions
- [Q]: Caramel is optically inactive glucose
- [R] : Caramel is obtained by burning of glucose
- [S] : Caramel is obtained by degradation of fructose

Choose the right combination of statements.

- (a) P & Q are true but R & S are false
- (b) P & S are true but Q & R are false
- (c) Q & R are true but P & S are false
- (d) R & S are true but P & Q are false

143. Read the following statements regarding value added tax (VAT):

- [P] : It is an indirect tax
- [Q]: It is charged at the rate of 8%
- [R] : It is tax at source
- [S] : It is effective since April 2010

Choose the correct option.

- (a) P&Q are true R&S are false
- (b) R & S are true P & Q are false
- (c) P&R are true Q&S are false
- (d) Q&S are true P&R are false

144. Find the process by which the conversion of sulfasalazine to sulfapyridine and 5-amino salicylic acid takes place in the colon

- (a) Hydrolysis                      (b) Deamination                      (c) Acetylation                      (d) Azoreduction

145. How much quantity (In grams) of sodium chloride is needed to make 30 ml of a 2% isotonic drug (sodium chloride equivalent 0.20) solution

- (a) 0.60                      (b) 0.27                      (c) 0.15                      (d) 0.12

146. Read the following statements about lyophilization:

[P] : Lyophilization cannot be done in final containers like multiple dose containers.

[Q]: Lyophilized product needs special methods for reconstitution.

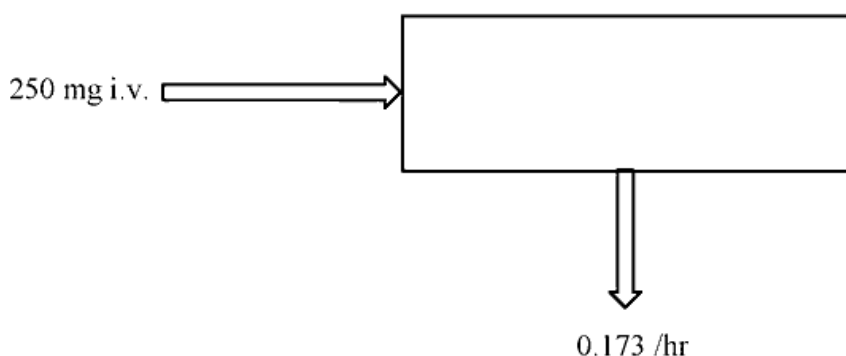
[R]: Lyophilization causes protein denaturation in tissues.

[S] : Lyophilization is suitable for drying the thermolabile products.

Choose the correct combination of statements.

- (a) P is true and Q R & S are false                      (b) Q is true and P, R & S are false  
(c) R is true and P, Q & S are false                      (d) S is true and P, Q & R are false

147. In a pharmacokinetic model depicted in the following scheme, what is the half-life of the drug if the apparent volume of distribution of the drug is 25 L?



- (a) 1.7 hr                      (b) 2 hr                      (c) 4 hr                      (d) 3hr

148. A sample of paracetamol tablets claims to contain 500 mg of paracetamol. But, on analysis by Govt. Analyst, it was found to contain 200 mg. As per Drugs and Cosmetics Act, 1940, this product would be categorized as what?

- (a) Misbranded drug                      (b) Adulterated drug  
(c) Spurious drug                      (d) Unethical drug

149. Use of which of the following artificial sweeteners is permitted in various dosage forms of Ayurveda, Siddha and Unani proprietary medicines?

- (a) Sucralose                      (b) Aspartame  
(c) Saccharin                      (d) All of them

## ANSWER KEY GPAT 2012

1-a	2-c	3-b	4-a	5-a	6-b	7-c	8-b	9-d	10-c
11-b	12-d	13-d	14-b	15-a	16-d	17-a	18-d	19-b	20-c
21-d	22-a	23-c	24-d	25-c	26-b	27-c	28-d	29-a	30-b
31-c	32-d	33-d	34-c	35-b	36-b	37-b	38-d	39-a	40-a
41-b	42-a	43-a	44-b	45-b	46-b	47-a	48-d	49-d	50-c
51-c	52-a	53-b	54-b	55-b	56-b	57-d	58-c	59-a	60-a
61-b	62-b	63-a	64-b	65-a	66-c	67-d	68-d	69-d	70-b
71-a	72-a	73-c	74-a	75-a	76-b	77-d	78-a	79-d	80-a
81-d	82-b	83-a	84-c	85-c	86-b	87-d	88-a	89-a	90-c
91-c	92-c	93-d	94-c	95-d	96-c	97-d	98-c	99-c	100-d
101-a	102-d	103-a	104-a	105-b	106-b	107-c	108-b	109-b	110-a
111-c	112-b	113-c	114-b	115-d	116-d	117-c	118-a	119-d	120-b
121-d	122-a	123-c	124-b	125-d	126-a	127-a	128-d	129-d	130-a
131-d	132-d	133-b	134-d	135-c	136-c	137-b	138-a	139-b	140-c
141-d	142-b	143-c	144-d	145-c	146-d	147-c	148-a	149-d	150-c



# GPAT QUESTION PAPER 2011 WITH ANSWER KEY

## GPAT QUESTIONS

1. A glycoalkaloid

[P] Contains sulphur in addition to nitrogen in its molecule  
[Q] Is glycosidic in nature.  
[R] Can be hydrolysed to an alkaloid.  
[S] Always contains endocyclic nitrogen in its molecule.

(a) P&R                      (b) Q&S                      (c) Q&R                      (d) P&Q
2. Which of the following statements are true for ginseng root

[P] It is among the most traded plant material of Brazil  
[Q] It is obtained from *Panax ginseng* and *Panax quinquefolium*  
[R] It is obtained from young plants of six months to one year age  
[S] It contains derivatives of protopanaxadiol

(a) P&Q                      (b) R&S                      (c) Q&R                      (d) Q&S
3. Which of the following drugs is a triterpenoid containing root?

(a) Valerian                      (b) Brahmi                      (c) Satavari                      (d) Adusa
4. Which of the following alkaloids is derived from tyrosine

(a) Quinine                      (b) Morphine                      (c) Atropine                      (d) Ephedrine
5. The following options carry the name of the plant, part used and its family. Find awrong combination.

(a) *Aegle marmelos*, fruit & Rutaceae  
(b) *Conium maculatum*, fruit & Umbelliferae  
(c) *Glycyrrhiza glabra*, root and stolon & Leguminosae  
(d) *Strophanthus gratus*, seed & Scrophulariaceae
6. Anomocytic stomata, trichomes with collapsed cell and absence of calcium oxalate crystals are some of themicroscopic features of which plant

(a) Digitalis                      (b) Hyoscyamus                      (c) Mentha                      (d) Senna
7. Each of the following options lists the name of the drug, its class, pharmacologicalaction and plant source.Choose an option showing a wrong combination.

(a) Asafoetida, oleo-gum-resin, anti-flatulence, *Ferula foetida*  
(b) Benzoin, balsam, antiseptic, *Styrax benzoin*  
(c) Myrrh, gum-resin, antiseptic, *Commiphora wightii*  
(d) Papaine, enzyme, proteolytic, *Carica papaya*

8. Quinoline alkaloids are biosynthesized via which one of the following pathways
- (a) Shikimic acid –tyrosine (b) Shikimic acid -tryptophan  
(c) Shikimic acid -cathinone (d) Shikimic acid -phenylalanine
9. Which of the following ergot alkaloids is water soluble and shows blue fluorescence
- (a) Ergosine (b) Ergotamine  
(c) Ergocristine (d) Ergometrine
10. Khellin is an active constituent of which one of the following plants
- (a) *Prunus serona* (b) *Tribulus terrestris*  
(c) *Ammi visnaga* (d) *Vanilla planifolia*
11. Goldbeater's skin test is used to detect the presence of which one of the following classes of compounds
- (a) Tannins (b) Steroids  
(c) Glycerides (d) Resins
12. Which one of the following compounds is useful for the stimulation of cell division and release of lateral bud dormancy?
- (a) zeatin (b) 2, 4-Dichlorophenoxyacetic acid  
(c) Indole acetic acid (d) Picloram
13. Phenylethylisoquinoline is the precursor of which of the following alkaloids
- (a) Colchicine (b) Papaverine  
(c) Emetine (d) Cephaline
14. A powdered drug has the following microscopic characters: Anther cells, parenchyma, pollen grains, phloem fibers, volatile oil cells and stone cells. The powder is obtained from which of the followings?
- (a) Clove bud powder (b) Clove bud powder with stalk  
(c) Mother Cove (d) None of the above
15. Arrange the following fatty acids in decreasing order of their unsaturation (highest to lowest)
- [P] Stearic [Q] Oleic acid [R] Linolenic acid [S] Linoleic acid
- (a) P>Q>R>S (b) S>R>P>Q  
(c) R>S>Q>P (d) Q>P>R>S
16. Determine the correctness or otherwise of the following Assertion [a] and the Reason [r]:
- Assertion (a):** Tannins are polyphenolic substances occurring in plant cell sap. Hydrolysable and condensed tannins are differentiated by match stick test.
- Reason (r) :** The condensed tannins are resistant to acid hydrolysis therefore stain the lignin present in matchstick.
- (a) Both (a) and (r) are true, and (r) is a correct reason for (a)  
(b) Both (a) and (r) are true, but (r) is NOT the correct reason for (a)  
(c) (a) is true but (r) is NOT the correct reason for (a)  
(d) Both (a) and (r) are false

17. Determine the correctness or otherwise of the following Assertion [a] and the Reason [r]:  
**Assertion (a):** Castor oil is soluble in alcohol and is used as purgative.  
**Reason (r) :** The oil contains ricinoleic acid having a hydroxyl group at C-12 position which is responsible for its solubility in alcohol and its purgative action.
- (a) Both (a) and (r) are true but (r) is NOT the correct reason for (a)  
 (b) (a) is true but (r) is NOT the correct reason for (a)  
 (c) Both (a) and (r) are true and (r) is the correct reason for (a)  
 (d) Both (a) and (r) are false
18. In acetate mevalonate pathway geranyl pyrophosphate leads to formation of monoterpenes, the major constituents of volatile oils.
- [P] Geranyl pyrophosphate contains two isoprene units  
 [Q] Monoterpenes have 15 carbon atoms  
 [R] The two isoprene units condense in head to tail fashion to give Monoterpenes  
 [S] Isoprene unit has molecular formula of  $C_5H_8$ .
- which one of the given statements is correct?
- (a) P is true, Q is false, R is true, S is false                      (b) P is false, Q is true, R is true, S is false  
 (c) P is true, Q is true, R is false, S is true                      (d) P is true, Q is false, R is true, S is true
19. Two genetic types of Cannabis i.e. drug type and Hemp types are cultivated.
- [P] Drug type cannabis is rich in (-) 9-trans-tetrahydrocannabinol  
 [Q] Hemp type cannabis is rich in cannabidiol  
 [R] Drug type cannabis is rich in cannabidiol  
 [S] Hemp type cannabis contains elongated bast fibres
- which one of the given statements is correct?
- (a) P is true, Q is true, R is true, S is true                      (b) P is true, Q is false, R is false, S is true  
 (c) P is true, Q is true, R is false, S is true                      (d) P is false, Q is false, R is true, S is false
20. Each of the following options lists a phytoconstituent, its phytochemical grouping, pharmacological activity and corresponding semisynthetic analogue. Find a MISMATCHING option
- (a) Podophyllotoxin, lignan, anticancer, etoposide  
 (b) Sennoside, anthraquinone, laxative, sinigrin  
 (c) Atropine, alkaloid, anticholinergic, homatropine  
 (d) THC, terpenophenolic, psychoactive, nabilone
21. Inhibition/induction of which of the following Cytochrome P450 enzyme system is most likely to be involved in important drug-drug interactions
- (a) CYP3A4                      (b) CYP2D6                      (c) CYP2C9                      (d) CYP1A2
22. Which of the following mechanisms is NOT related to platelet aggregation inhibitory action
- (a) ADP receptor antagonism                      (b) Glycoprotein IIb/IIIa receptor antagonism  
 (c) Phosphodiesterase inhibition                      (d) Prostacyclin inhibition

23. Choose the correct statement about the given four diseases?  
 [P] Cardiomyopathy [Q] Rheumatoid arthritis  
 [R] Myasthenia gravis [S] Ulcerative colitis  
 (a) Q & S are autoimmune disorders (b) P & Q are autoimmune disorders  
 (c) P & R are not autoimmune disorders (d) R & S are not autoimmune disorders
24. Which of the following species is being inactivated by the enzyme Dipeptidyl Peptidase-4  
 (a) Oxytocin (b) vasopressin (c) Incretins (d) Glucagon
25. Patients taking isosorbide mononitrate or nitroglycerine should be advised not to take Sildenafil. This drug- drug interaction causes which of the following actions  
 (a) Respiratory failure (b) Severe hypotension  
 (c) Prolongation of QT interval (d) Myocardial ischemia
26. Which of the following drugs does NOT induce mydriasis?  
 (a) Atropine (b) Ephedrine (c) Phentolamine (d) Cocaine
27. Which of the following statements is TRUE for angiotensin-II  
 (a) Causes myocyte hypertrophy  
 (b) Decreases the action of sympathetic nervous system  
 (c) Increases force of myocardial contraction  
 (d) Decreases the synthesis and release of aldosterone
28. Which of the following beta blockers has been shown clinically to reduce mortality in patients of symptomatic heart failure <http://www.xamstudy.com>  
 (a) Atenolol (b) Carvedilol (c) Propranolol (d) Esmolol
29. All of the given four drugs cause vasodilatation. Choose the correct statement about them.  
 [P] Bradykinin [Q] Minoxidil [R] Acetylcholine [S] Hydralazine  
 (a) P & Q cause release of nitric oxide (b) Q & R do not cause release of nitric oxide  
 (c) R & S cause release of nitric oxide (d) P & S do not cause release of nitric oxide
30. Rhabdomyolysis is the side effect associated with which of the following classes of drugs  
 (a) ACE inhibitors (b) Statins  
 (c) Calcium channel blockers (d) Sodium channel blockers
31. Blood level monitoring of HbA1c is important in which of the given diseased states  
 (a) Hypercholesterolemia (b) Diabetes mellitus  
 (c) Myocardial infarction (d) Congestive heart failure
32. Most of the emergency contraceptives have which one of the following active ingredients  
 (a) Estradiol (b) Norethindron (c) Misoprostol (d) Levonorgesterol
33. Which of the following antibiotics produces concentration dependent bactericidal action and also possesses post-antibiotic effect  
 (a) Ceftazidime (b) Azithromycin (c) Amikacin (d) Piperacillin
34. Antiretroviral Raltegravir is unique, because of which of its following actions  
 (a) Integrase inhibition (b) CCR5 Co-receptor antagonism  
 (c) Fusion inhibition (d) Reverse transcriptase inhibition



35. What is chemotaxis
- (a) Toxicity of chemicals (b) Taxonomy of chemicals  
(c) Inhibition of Inflammation (d) Movement of leucocytes in inflammation
36. Which one of the followings is NOT an example of G-protein coupled receptor?
- (a) Muscarinic cholinergic receptor (b) Alpha adrenoceptor  
(c) Nicotinic cholinergic receptor (d) Beta adrenoceptor
37. Which of the followings used in the treatment of rheumatoid arthritis is NOT a biologic response modifier
- (a) Anakinra (b) Leflunomide (c) Etanercept (d) Infliximab
38. Which of the following statements is FALSE for artemisinin?
- (a) It is a sesquiterpene lactone endoperoxide  
(b) It is a drug of choice in prophylaxis of malaria  
(c) It does not cure relapsing malaria  
(d) It is useful in treatment of cerebral falciparum malaria
39. Which of the followings is a noncompetitive inhibitor of the enzyme reverse transcriptase in HIV
- (a) Lamivudine (b) Nevirapine (c) Abacavir (d) Tenofovir
40. Which of the followings is the most effective monotherapy for raising HDL cholesterol
- (a) Statins (b) Niacin (c) Ezetimibe (d)  $\omega$ -3-Fatty acids
41. Which of the following parameters from plasma concentration time profile study gives indication of the rate of drug absorption?
- (a)  $C_{max}$  (b)  $T_{max}$  (c) AUC (d)  $t_{1/2}$
42. Which of the following pairs has high binding affinity for  $5\alpha$ -reductase
- (a) Letrozole and androstenedione (b) Finasteride and testolactone  
(c) Finasteride and 5-DHT (d) Finasteride and testosterone
43. Which of the following skeletal muscle relaxants acts directly on the contractile mechanism of the muscle fibers
- (a) Pancuronium (b) Baclofen (c) Dantrolene (d) Chorzoxazone
44. Which is the molecular target for the vinca alkaloids as anticancer agents
- (a) Tyrosine kinase (b) DNA (c) Ribosomes (d) Tubulin
45. Choose the correct pair of the neurodegenerative disorders from those given below.
- (a) Parkinson's disease and Alzheimer's disease (b) Schizophrenia and Mania  
(c) Alzheimer's disease and Schizophrenia (d) Parkinson's disease and Autism
46. A 64 year old woman with a history of Type II diabetes is diagnosed with heart failure. which of the followings would be a Poor choice in controlling her diabetes
- (a) Metformin (b) Pioglitazone (c) Glipizide (d) Exenatide

47. Mifepristone and gemeprost combination is used for medical termination of pregnancy. The action is caused due to which of the following mechanisms
- Mifepristone is an antiestrogen while gemeprost is a prostaglandin E receptor agonist
  - Mifepristone is an antiprogesterin while gemeprost is a prostaglandin E receptor agonist
  - Mifepristone is an antiandrogen while gemeprost is a prostaglandin E receptor agonist
  - Mifepristone is an antiprogesterin while gemeprost is a prostaglandin E receptor antagonist
48. Which one of the following is a  $\beta$  lactamase inhibitor
- Penicillanic acid
  - Embonic acid
  - Cephalosporanic acid
  - Clavulanic acid
49. All of the following are indications for use of ACE inhibitors Except for one. Identify that
- Hypertension
  - Myocardial infarction
  - Left ventricular dysfunction
  - Pheochromocytoma
50. Neural tube defects may occur by which one of the following anti-seizure drugs
- Ethosuximide
  - Vigabatrin
  - Valproic acid
  - Primidone
51. Which water is used for hand washing in a change room of pharmaceutical manufacturing plant?
- Potable water
  - Purified water
  - Disinfectant water
  - Soap water
52. Which one of the following drying methods is commonly used in Pharma industry for drying of soft shell capsules?
- Truck drying.
  - Fluid bed drying
  - Vacuum drying
  - Microwave drying
53. Which one of the following does NOT afford a macromolecular inclusion compound
- Zeolites
  - Dextrins
  - Silica gels
  - Cyclodextrins
54. If  $C$  is the concentration of dissolved drug and  $C_s$  is the saturation concentration. In which case the sink conditions are said to be maintained?
- $C < 20\%$  of  $C_s$
  - $C > 20\%$  of  $C_s$
  - $C < 10\%$  of  $C_s$
  - $C > 10\%$  of  $C_s$
55. Which condition does not apply as per Indian law while conducting single dose bioavailability study of an immediate release product
- Sampling period should be at least three  $t_{1/2}$  el
  - Sampling should represent pre-exposure, peak exposure and post-exposure phases
  - There should be at least four sampling points during elimination phase
  - Sampling should be continued till measured AUC is at least equal to 80% of AUC
56. Upon standing sometimes gel system shrinks a bit and little liquid is pressed out. What is this phenomenon, known as
- Oozing
  - Syneresis
  - Shrinking
  - Desolvation
57. Which of the following routes of administration of drugs is associated with Phlebitis
- Subcutaneous
  - Intravenous
  - Intraspinal
  - Intradural



58. Study the following two statements and choose the correct answer

[P] Antibodies are serum proteins providing immunity.

[Q] IgG provides immunity to new born babies while IgM is the first generated antibody.

- (a) P is correct and Q is incorrect                      (b) P is incorrect and Q is correct  
(c) Both P and Q are correct                              (d) Both P and Q are incorrect

59. Which microbe is used for validation of sterilization by filtration process

- (a) *Bacillus stearothermophilus*                      (b) *Pseudomonas diminuta*  
(c) *Bacillus subtilis*                                      (d) *Pseudomonas aeruginosa*

60. Non-linear pharmacokinetics can be expected due to

[P] Enzyme induction

[Q] Active secretion Choose the correct answer

- (a) Both P and Q are true                              (b) P is true, Q is false  
(c) Q is true. P is false                                (d) Both P and Q are false

61. Which wavelength of the UV light provides maximum germicidal action

- (a) 253.7 nm                      (b) 275.5 nm                      (c) 283.5 nm                      (d) 240.0 nm

62. Which of the following statements is INCORRECT

- (a) Chick Martin test uses organic matter in media  
(b) The organism in Rideal-walker test is *S. typhi*  
(c) Rideal-walker test uses organic matter in media  
(d) The organism in Chick Martin test is *S. typhi*

63. Which of the following forces contribute to stability of charge-transfer complexes

- (a) Resonance forces  
(b) Resonance and London dispersion forces  
(c) Dipole-dipole interactions and London dispersion forces  
(d) Resonance forces and dipole-dipole interactions

64. Which of the following isotherms are produced when the heat of condensation of successive layers is more than the heat of adsorption of first layer

- (a) Type III and IV                                      (b) Type II and V  
(c) Type I and III                                      (d) Type III and V

65. Which of the followings act as a non-ionic emulsifying agent

- (a) Triethanolamineoleate                              (b) Polyoxyethylene sorbitan monooleate  
(c) N-Cetyl-N-ethylmorpholinium ethosulfate                      (d) Dioctylsulphosuccinate

66. The minimal effective flow rate of air in laminar flow hood should be not less than how many cubic feet per minute

- (a) 10                              (b) 50                              (c) 100                              (d) 1000

67. Which of the following Schedules include shelf life of drugs

- (a) Schedule F                      (b) Schedule M                      (c) Schedule G                      (d) Schedule P

68. Which of the following pumps is used in handling of corrosive liquids  
 (a) Turbine pump (b) volute pump (c) Air binding pump (d) Peristaltic pump
69. By addition of which of the followings the shells of soft gelatin capsules may be made elastic  
 (a) Polyethylene glycol (b) Sorbitol (c) Propylene glycol (d) Dibutyl phthalate
70. Convert 90% v/v alcohol to Proof strength. Choose the correct answer:  
 (a) 57.77° under proof (b) 57.77° over proof  
 (c) 47.41° over proof (d) 47.41° under proof
71. Department of Transport Test (DOT) is performed for which of the followings  
 (a) Strip packing (b) Aerosols (c) Injection packing (d) Glass containers
72. What is the Heat of vaporization of water at 100°C?  
 (a) 2790 cal/mole (b) 7290 cal / mole (c) 7920 cal/mole (d) 9720 cal/mole
73. Determine the correctness or otherwise of the following Assertion [a] and the Reason [r]:  
**Assertion[a]:** For a pharmaceutical powder true density is greater than the granule density.  
**Reason[r]:** Mercury displacement used for determining granule density, allows penetration of liquid into internal pores of the particles.  
 (a) [a] is true but [r] is false  
 (b) Both [a] and [r] are false  
 (c) Both [a] and [r] are true and [r] is the correct reason for [a]  
 (d) Both [a] and [r] are true but [r] is NOT the correct reason for [a]
74. Determine the correctness or otherwise of the following statements:  
 [P] Rheopexy is the phenomenon when a sol forms gel more readily when sheared gently.  
 [Q] In a rheopectic system, sol is the equilibrium form.  
 [R] Rheopexy is a phenomenon when a sol forms gel when the material is kept at rest  
 (a) [R] is true but [P] and [Q] are false (b) [P] is true but [Q] and [R] are false  
 (c) [P], [Q] and [R], all are false (d) [P], [Q] and [R], all are true
75. Define Plasmapheresis Choose the correct answer  
 (a) The process of collecting plasma and returning the red blood cells concentrate to the donor  
 (b) The process of collecting red blood cells concentrate and returning the plasma to the donor  
 (c) The process of separating white blood cells from blood  
 (d) The process of generating artificial blood plasma expanders
76. Molecules in the smectic liquid crystals are characterized by which one of the followings  
 (a) Mobility in three directions and rotation in one axis  
 (b) Mobility in two directions and rotation in one axis  
 (c) Mobility in two directions and no rotation  
 (d) Mobility in three directions and no rotation
77. Choose the correct sequence of Moisture vapor Transmission Rate in packaging materials?  
 (a) Paper > Aluminium foil > PVC > PVdC (b) Aluminium foil > PVC > PVdC > Paper  
 (c) Aluminium foil > PVdC > PVC > Paper (d) Paper > PVC > PVdC > Aluminium foil

78. How many mL of 50% (w/v) dextrose solution and how many mL of 5% (w/v) dextrose solution are required to prepare 4500 mL of a 10 (w/v) solution?
- (a) 500 mL of 50% and 4000 mL of 5%      (b) 1000 mL of 50% and 3500 mL of 5%  
(c) 4000 mL of 50% and 500 mL of 5%      (d) 1500 mL of 50% and 3000 mL of 5%
79. A drug is administered to a 65 Kg patient as 500 mg tablets every 4 hours. Half-life of the drug is 3 h, volume of distribution is 2 liter/Kg and oral bioavailability of the drug is 0.85. Calculate the steady state concentration of the drug
- (a) 5.05 mcg/ml      (b) 4.50 mcg/ml      (c) 3.53 mcg/ml      (d) 3.00 mcg/ml
80. P-Glycoprotein pump is responsible for which one of the followings
- (a) Transporting the drugs from the enterocytes into the gut lumen  
(b) Transporting the drugs from gut lumen into enterocytes  
(c) Transporting the drugs from oral mucosa into blood capillaries  
(d) Transporting the drugs from Peyer's patches into the gut lumen
81. Statement [X]: Hofmeister series grades coagulating power of electrolytes as per their ionic size.  
Statement [Y]: The relative coagulating power is given by:
- [P]  $Al^{+++} > Ba^{++}$       [Q]  $Li > F^-$  [R]  $NH^+ > Na^+$
- Choose the correct statement:
- (a) Statement X is true but P, Q and R are false in Statement Y  
(b) Statement X is false and P, Q and R are false in Statement Y  
(c) Statement X is true and Q and R are false in Statement Y  
(d) Statement X is false and P is false in Statement
82. The first stage of wetting on addition of a granulating agent to the powders is characterized by which one of the followings?
- (a) Capillary state      (b) Pendular state      (c) Funicular state      (d) Droplet state
83. Larger values of  $K_y$  in the Heckel Plot indicate formation of what quality of tablets?
- (a) Harder tablets      (b) Softer tablets      (c) Fluffy tablets      (d) Brittle tablets
84. The degree of flocculation of a suspension is 1.5 and the sedimentation volume is 0.75. What will be the ultimate volume of deflocculated suspension
- (a) 2.0      (b) 1.5      (c) 0.75      (d) 0.5
85. What will be the time required for a drug exhibiting first order rate constant of 4.6/hr to be degraded from initial concentration of 100 mg/ml to 10 mg/ml?
- (a) 2 hr      (b) 4hr      (c) 9 hr      (d) 0.5 hr
86. What will be the dose required maintaining therapeutic concentration of 20  $\mu\text{g}/\text{ml}$  for 24 hr of a drug exhibiting total clearance of 2 L/hr?
- (a) 96 mg      (b) 480 mg      (c) 960 mg      (d) 48 mg
87. What will be the urine to plasma ratio of a weakly acidic drug having  $pK_a$  of 5?  
[urine (pH : 5) plasma (pH : 7)]
- (a) 1:101      (b) 1:201      (c) 2:101      (d) 1:202

88. The Reynolds number widely used to classify flow behavior of fluids is the ratio of which one of the followings:
- (a) Inertial forces to gravitational forces                      (b) Inertial forces to viscous forces  
(c) Viscous forces to inertial forces                              (d) viscous forces to gravitational forces
89. If the distillation graph using McCabe Thiele method is parallel to x-axis, then the feed is which one of the followings?
- (a) Saturated liquid    (b) Saturated vapor  
(c) Superheated liquid    (d) Superheated vapor
90. What for the baffles are provided in a shell and tube heat exchanger?
- (a) To increase turbulence    (b) To decrease turbulence  
(c) To prevent corrosion    (d) To increase shell side passes
91. SOS means which one of the followings
- (a) Take occasionally    (b) Take immediately  
(c) Take when necessary    (d) Take as directed
92. Which statement is FALSE for Association Colloids
- (a) They are also called amphiphiles                              (b) They contain aggregated molecules  
(c) They show partial solvation                                      (d) They are also called micelles
93. Which of the followings is NOT a reciprocating pump
- (a) Plunger pump    (b) Diaphragm pump  
(c) Gear pump    (d) Piston pump
94. Which is NOT applicable to protein binding
- (a) Klotz reciprocal plot    (b) Sandberg modified equation  
(c) Blanchard equation     (d) Detli plot
95. Statement [P] : Soft gelatin capsules contain 12-15 % moisture.  
Statement [Q] : Hard gelatin capsule shells contain 6-10 % moisture.  
Choose the correct statement? <http://www.xamstudy.com>
- (a) Both of the above statements P&Q are true                      (b) Both of the above statements P&Q are false  
(c) Statement P is true and Q is false                              (d) Statement P is false and Q is true
96. According to USP, the speed regulating device of the dissolution apparatus should be capable of maintaining the speed within limits of what % of the selected speed?
- (a) 1%    (b) 2%    (c) 4%    (d) 5%
97. A drug whose solubility is 1 g/L in water, when given orally at a dose of 500 mg is absorbed up to 95% of the administered dose. The drug belongs to which class according to the BCS classification?
- (a) Class I    (b) Class II    (c) Class III    (d) Class IV
98. Which statement is NOT true for steam distillation
- (a) It is also called differential distillation  
(b) It can be used for separation of immiscible liquids  
(c) It can be applied for volatile substances  
(d) It can be used for separation of miscible liquids



99. The area of clear opening of any two successive sieves according to Tyler standard is in the ratio of-----.
- (a) 1 : 4                      (b) 1 : 6                      (c) 1 :  $\sqrt{2}$                       (d) 1 :  $\sqrt{3}$
100. What is Primogel
- (a) Substituted HPMC for direct compression  
 (b) Modified microcrystalline cellulose for direct compression  
 (c) Hydro gelling polymer for gel formation  
 (d) Modified starch for disintegration
101. A tooth paste contains stannous fluoride and calcium pyrophosphate along with other formulation constituents. Choose the correct statement out of the followings?
- (a) Stannous fluoride is an anticaries agent while calcium pyrophosphate is a dentifrice  
 (b) Stannous fluoride is a dentifrice while calcium pyrophosphate is a desensitizing agent  
 (c) Stannous fluoride is a desensitizing agent while calcium pyrophosphate is an anticaries agent  
 (d) Both are dentifrices while calcium pyrophosphate is additionally a desensitizing agent
102. Hydrogen peroxide solution (20 volumes) is used topically as a mild antiseptic. It is mainly used for cleaning of wounds which could be due to some of the following actions of hydrogen peroxide.
- [P] Astringent action  
 [Q] Nascent hydrogen releasing action  
 [R] Oxidizing action  
 [S] Mechanical cleansing action
- Choose the correct statements for the use of hydrogen peroxide as cleaning agent for wounds
- (a) P&R                      (b) P&Q                      (c) R&Q                      (d) R&S
103. Magnesium trisilicate is considered to be a better antacid than aluminium hydroxide due to its following additional properties:
- [P] It has a fixed chemical composition  
 [Q] It forms colloidal silicone dioxide  
 [R] Magnesium ions overcome constipation  
 [S] Magnesium ions cause higher inhibition of pepsin than aluminium ions
- Choose the correct combination of statements
- (a) Q&S                      (b) R&S                      (c) P&Q                      (d) Q&R
104. Boric acid is a weak acid (pKa 9.19) which cannot be titrated with a standard solution of sodium hydroxide using phenolphthalein as indicator. This titration becomes possible on addition of glycerol due to one of the following reactions. Choose the correct reaction
- (a) Boric acid becomes boronic acid on reaction with glycerol  
 (b) Boric acid gives a monoprotic tetravalent boron ester with glycerol  
 (c) Boric acid gives a tribasic acid on reaction with glycerol  
 (d) Two boric acid molecules combine to give an anhydride in presence of glycerol

105. An iron compound used as heamatinic agent must meet two requirements i.e. it should be biologically available and be non-irritating. Which one of the following compounds meet the above two requirements most closely
- (a) Ferric chloride (b) Ferric ammonium sulphate  
(c) Ferric ammonium citrate (d) Ferrous thioglycollate
106. Iodine-131 as sodium iodide solution is used as a radiopharmaceutical for diagnostic and therapeutic purposes. Its usage is dependent on the release of the following emissions:
- [P] Alpha particles [Q] Positrons  
[R] Beta emission [S] Gamma radiation Choose the correct combination of statements
- (a) R&S (b) Q&S (c) P&R (d) P&S
107. Arrange the following Lowry-Bronsted acids into their decreasing order of acidity (highest to lowest)
- [P]  $C_2H_5OH$  [Q]  $H_3C-C\equiv CH$  [R]  $H_2O$  [S]  $CH_3NH_2$
- (a)  $R > P > Q > S$  (b)  $P > R > Q > S$   
(c)  $P > Q > R > S$  (d)  $R > Q > P > S$
108. Alkenes show typical electrophilic addition reactions. If an electron withdrawing group is attached to one of the carbons bearing the double bond, what will happen to the mechanism of the addition reaction
- (a) It remains electrophilic  
(b) It becomes free radical addition  
(c) It becomes pericyclic reaction  
(d) It becomes nucleophilic
109. Aprotic polar solvents increase the rate of  $SN_2$  reactions manifold. Enhancement in the rate of such reactions is due to which one of the following effects
- (a) Solvation of the anion by the solvent leaving the cation unaffected  
(b) Solvation of both of the ionic species  
(c) Desolvation of the cation and solvation of the anion  
(d) Solvation of the cation by the solvent leaving the anion unaffected
110. Five-membered heteroaromatic compounds show a much higher rate of electrophilic aromatic substitution reactions than the six-membered ones. This is due to which one of the following reasons?
- (a) Five-membered heteroaromatic compounds have higher circulating electron density in the ring than the six-membered ones  
(b) Five-membered heteroaromatic compounds have lower circulating electron density in the ring than the six-membered ones  
(c) Five-membered rings are smaller in size than the six membered ones which affects their reaction rates  
(d) Six membered heteroaromatic rings are flat while the five-membered ones are puckered
111. Pyridine is more basic than pyrrole. This is due to which of the following facts
- (a) Lone pair of electrons on N in pyrrole is localized  
(b) Lone pair of electrons on N in pyridine is localized  
(c) Nitrogen of pyrrole has one hydrogen atom attached to it while pyridine does not have any  
(d) Pyridine has three double bonds while pyrrole has only two



112. Diels-Alder reaction can be carried out in which of the following heterocyclic compounds most readily  
 (a) Pyrrole                      (b) Thiophene                      (c) Furan                      (d) Pyridine
113. In nucleophilic aliphatic substitution reactions arrange the following leaving groups in decreasing order of their leaving capacity?  
 [P] Brosyl                      [Q] Hydroxyl                      [R] Chloro                      [S] Mesyl  
 (a)  $S > R > P > Q$                       (b)  $P > S > R > Q$                       (c)  $R > Q > S > P$                       (d)  $R > S > Q > P$
114. Determine the correctness or otherwise of the following Assertion [a] and the Reason [r]:  
**Assertion (a):** Quaternary ammonium phase transfer catalysts can enhance the rate of nucleophilic aliphatic substitution reactions in biphasic systems with water soluble nucleophiles.  
**Reason (r):** Quaternary ammonium compounds are highly polar, positively charged water soluble compounds.  
 (a) Both (a) and (r) are true but (r) is not the correct reason for (a)  
 (b) Both (a) and (r) are true and (r) is the correct reason for (a)  
 (c) (a) is true (r) is false  
 (d) Both (a) and (r) are false
115. Which one of the given compounds can be used as primary standard for standardization of perchloric acid solution in non-aqueous titrations?  
 (a) Potassium hydrogen phthalate                      (b) Sodium bicarbonate  
 (c) Potassium dihydrogen phosphate                      (d) Sodium methoxide
116. In context of complexometry (complexometric titrations), the two terms labile and inert complexes, are used frequently. Choose the correct statement about them?  
 (a) Labile complexes are formed instantly while inert complexes take hours or days in their formation  
 (b) Labile complexes take much longer time in formation than inert complexes  
 (c) Labile complexes get hydrolyzed in water immediately while inert complexes are stable in water  
 (d) Labile complexes get decomposed on mild heating in aqueous solutions while inert complexes do not decompose
117. Indicators used in complexometric titrations are chelating agents. Choose the correct statement about them  
 (a) Indicator-metal ion complex should have higher stability than EDTA-Metal ion complex  
 (b) Indicator-metal ion complex should have lower stability than EDTA-Metal ion complex  
 (c) Indicator-metal ion complex should have equal stability as EDTA-Metal ion complex  
 (d) Stability of the indicator-metal ion complex is not an important criterion in complexometric titrations
118. In colorimetric estimation of a drug, the following sequence of reactions is carried out: treatment of the aqueous solution of the drug with sodium nitrite solution in acidic medium followed by addition of sulphamic acid and then treatment with N-(1-naphthyl) ethylene- diamine in slightly basic medium to obtain a pink colour; which is measured at a fixed wavelength to correlate the quantity of the drug with the optical density. Identify the drug under estimation  
 (a) Streptomycin sulphate                      (b) Thiamine hydrochloride  
 (c) Dexamethasone                      (d) Sulphamethoxazole

119. Name the compound used for standardization of Karl-Fisher reagent in aquametry?
- (a) Sodium tartrate dihydrate                      (b) Copper sulphate pentahydrate  
(c) Sodium iodide                                      (d) Sodium thiosulphate
120. In the electrochemical series, the standard reduction potentials of copper and zinc are +0.337 v and -0.763 v, respectively. If the half cells of both of these metals are connected externally to each other through an external circuit and a salt bridge, which one of the following processes will take place?
- (a) Zinc metal electrode will start dissolving in solution while copper ions will start depositing on the copper electrode.  
(b) Copper metal electrode will start dissolving in solution while zinc ions will start depositing on the zinc electrode  
(c) Both of the metal electrodes will start dissolving in the solution  
(d) Both types of ions will start depositing on their respective electrodes
121. In polarography, DME has a number of advantages. One of the advantages is that mercury has large hydrogen over potential. It means which one of the followings?
- (a) Hydrogen ions get easily reduced on the DME  
(b) Hydrogen gas gets easily reduced on the DME  
(c) Hydrogen ions require high potential to be reduced at DME  
(d) Water is difficult to get oxidized at DME
122. Following are the desirable properties of the liquid phase used in GLC EXCEPT for one of the followings. Identify that
- (a) It should be inert to the analytes  
(b) It should have high viscosity at operating temperature  
(c) It should have low vapour pressure at the operating temperature  
(d) It should have a high resolving power
123. In HPLC analysis what type of column would you prefer
- (a) A column with high HETP and high number of plates  
(b) A column with low HETP and low number of plates  
(c) A column with high HETP and low number of plates  
(d) A column with low HETP and high number of plates
124. To synthesize sulphonyl urea antidiabetic, which of the following reactions can be used
- (a) Reacting a suitably substituted sulphonyl chloride with a desired urea derivative under basic conditions  
(b) Reacting a suitably substituted sulphonamide with a desired isocyanate derivative  
(c) Reacting a suitably substituted sulphonic acid with a desired isocyanate derivative  
(d) Reacting a suitably substituted sulfoxide with a desired urea derivative



129. Choose the FALSE statement for E 2 mechanism in elimination reactions?

- (a) These reactions are accompanied by rearrangements
- (b) These reactions show a large hydrogen isotope effect
- (c) These reactions show a large element effect
- (d) These reactions are not accompanied by hydrogen exchange

130. Choose the correct statement for writing the sequence of amino acids in a polypeptide?

- (a) Amino terminal is to be written on the left hand side while the carboxyl terminal is to be written on the right hand side
- (b) Carboxyl terminal is to be written on the left hand side while the amino terminal is to be written on the right hand side
- (c) Any of the amino acid terminals can be written on any sides but it is to be mentioned by specifying the amino terminal and the carboxyl terminal in abbreviations <http://www.xamstudy.com>
- (d) It varies from author to author how the sequence of amino acids in a polypeptide is to be written

131. BETA-Carboline ring system is present in

- (a) Emetine
- (b) Riboflavine
- (c) Deserpidine
- (d) d-Tubocurarine

132. Which one of the following is NOT a bioisosteric pair?

- (a) Divalent ether (-O-) and amine (-NH)
- (b) Hydroxyl (-OH) and thiol (-SH)
- (c) Carboxylate ( $\text{CO}_2^-$ ) and sulfone ( $\text{SO}_2$ )
- (d) Hydrogen(-H) and fluorine (-F)

133. Of the four stereoisomers of chloramphenicol which one is the biologically active isomer

- (a) L-Erythro
- (b) L-Threo
- (c) D-Erythro
- (d) D-Threo

134. The catalytic triad in acetyl cholinesterase is composed of which of the following amino acid residues?

- (a) Serine, Histidine and Glutamate
- (b) Serine, Arginine and Glutamate
- (c) Threonine, Histidine and Aspartate
- (d) Threonine, Arginine and Glutamate

135. Fajan's method of titrimetric analysis involves detection of the end point on the basis of which one of the followings

- (a) Colour change
- (b) Appearance of a precipitate
- (c) Neutralization reaction
- (d) Adsorption phenomenon

136. Which of the following statements is true?

- (a) Aliphatic protons have chemical shifts  $> 7$  ppm
- (b) Spin quantum number of proton is 1
- (c) Chemical shift describes electronic environment of a proton
- (d) Vicinal coupling constant is always higher than geminal coupling constant

137. In FT-IR instruments Michaelson interferometer is used in place of grating. The function of the interferometer is to act as a modulator'. What do you understand by this statement?

- (a) The function of the interferometer is to act as a monochromator
- (b) The function of the interferometer is to convert high frequency radiations into low ones
- (c) The function of the interferometer is to convert low frequency radiations into high ones
- (d) The function of the interferometer is to convert frequency domain spectra into time domain spectra



138. Polyamine polystyrene resins belong to which category of ion-exchange resins?
- (a) Strongly Acidic Cation Exchange Resins      (b) Strongly Basic Anion Exchange Resins  
(c) Weakly Acidic Cation Exchange Resins      (d) Weakly Basic Anion Exchange Resins
139. Discrepancies in potential measurements involving factors like alkaline error and asymmetry potential are associated with which of the following electrodes?
- (a) Hydrogen electrode      (b) Quinhydrone electrode  
(c) Saturated calomel electrode      (d) Glass Electrode
140. Which amongst the following auxochromes produces a shift towards higher energy wave length?
- (a)  $-\text{CH}_3$       (b)  $-\text{NHCH}_3$       (c)  $-\text{Cl}$       (d)  $-\text{C}=\text{O}$
141. What is the wave number equivalent of 400 nm wavelength?
- (a)  $0.0025 \text{ cm}^{-1}$       (b)  $0.25 \text{ cm}^{-1}$       (c)  $2500 \text{ cm}^{-1}$       (d)  $25000 \text{ cm}^{-1}$
142. Chloroform is stored in dark colored bottles because it is oxidized in presence of light and air to a toxic compound. Identify that.
- (a)  $\text{CH}_2\text{Cl}_2$       (b)  $\text{COCl}_2$       (c)  $\text{CO}$       (d)  $\text{CCl}_4$
143. All of the given compounds show  $n^*$  transition. Identify which one will have the highest  $\lambda_{\text{max}}$ ?
- (a) Methanol      (b) Methylamine      (c) Methyl iodide      (d) Methyl bromide
144. Given are the four statements about NMR:
- [P]  $^{13}\text{C}$  NMR is a less sensitive technique than PMR  
[Q] Both  $^{13}\text{C}$  and  $^1\text{H}$  have  $l = 1/2$   
[R] Precessional frequency of the nucleus is directly proportional to the applied magnetic field  
[S] Deuterium exchange studies can be performed to ascertain protons attached to heteroatoms.
- Choose the correct combination of statements.
- (a) P, Q & R are true while S is false      (b) R, S & Q are true while P is false  
(c) S, P & Q are true while R is false      (d) All are true
145. Which of the following statements is WRONG?
- (a) The energy required for removing an electron from a molecule varies in the given order : lone pair < conjugated n < non conjugated n < a  
(b) Isotopic ratio is particularly useful for the detection and estimation of number of S, Cl and Br atoms in the compound in MS  
(c) Neutral fragments and molecules do not get detected in the detector in MS  
(d) The most intense peak in the MS is called the molecular ion peak
146. Which one is an example of a bulk property detector used in HPLC?
- (a) Fluorescence detector      (b) Photo diode array detector  
(c) Refractive index detector      (d) UV detector
147. The protons ortho to the nitro group in p-nitrotoluene are examples of which one of the following types
- (a) Chemically equivalent but magnetically non-equivalent protons  
(b) Chemically and magnetically equivalent protons  
(c) Chemically and magnetically nonequivalent protons  
(d) Chemically nonequivalent but magnetically equivalent protons

148. A 250 kg/mL solution of a drug gave an absorbance of 0.500 at 250 nm at a path length of 10 mm. what is the specific absorbance of the drug at 250 nm ?

- (a)  $0.002 \text{ cm}^{-1} \text{ gm}^{-1} \text{ litre}$  (b)  $0.002 \text{ cm}^{-1} \text{ gm}^{-1} \text{ dl}$   
(c)  $20 \text{ cm}^{-1} \text{ gm}^{-1} \text{ litre}$  (d)  $20 \text{ cm}^{-1} \text{ gm}^{-1} \text{ dl}$

149. The peak at m/z 91 in the mass spectrum for alkyl benzenes is due to which one of the followings

- (a) Alpha fission (b) Retro Diels-Alder rearrangement  
(c) Mc-Laffartey rearrangement (d) Tropylium ion formation

150. Following statements are given for a chemical reaction: Change in Gibb's free energy of the reaction has a negative value. Change in Enthalpy of the reaction has a negative value Change in Entropy of the reaction has a positive value Based on the above statements choose the correct answer.

- (a) The reaction is spontaneous.  
(b) The reaction is non-spontaneous.  
(c) The reaction could either be spontaneous or non-spontaneous.  
(d) The reaction can never be spontaneous.

**End of paper**

**ANSWER KEY GPAT 2011**

1-c	2-d	3-c	4-b/d	5-d	6-a	7-c	8-b	9-d	10-c
11-a	12-a	13-a	14-b	15-c	16-b	17-c	18-d	19-b	20-b
21-a	22-d	23-b	24-c	25-b	26-c	27-a	28-b	29-c	30-b
31-b	32-d	33-c	34-a	35-d	36-c	37-b	38-b	39-b	40-b
41-b	42-d	43-c	44-d	45-a	46-b	47-b	48-d	49-d	50-c
51-b	52-b	53-d	54-c	55-d	56-b	57-b	58-c	59-b	60-a
61-a	62-c	63-b	64-d	65-b	66-c	67-d	68-d	69-b	70-b
71-b	72-d	73-a	74-b	75-a	76-b	77-d	78-a	79-d	80-a
81-a	82-b	83-a	84-d	85-d	86-c	87-b	88-b	89-b	90-a
91-c	92-a	93-c	94-d	95-b	96-c	97-b	98-d	99-c	100-d
101-a	102-d	103-d	104-b	105-c	106-a	107-a	108-a	109-d	110-a
111-b	112-c	113-b	114-b	115-a	116-a	117-b	118-d	119-c	120-a
121-c	122-b	123-d	124-b	125-a	126-a	127-d	128-b	129-a	130-a
131-c	132-c	133-d	134-a	135-d	136-c	137-d	138-d	139-d	140-d
141-d	142-b	143-d	144-d	145-d	146-c	147-b	148-d	149-d	150-a

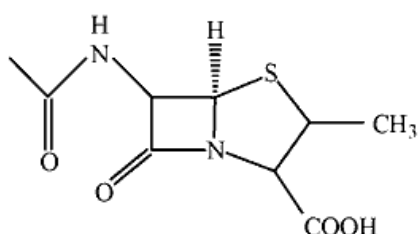


# GPAT QUESTION PAPER 2010 WITH ANSWER KEY

## GPAT QUESTIONS

- The vitamin essential in tissue culture medium is
  - Pyridoxine
  - Thiamine
  - Nicotinic acid
  - Inositol
- Gingko biloba is used for its
  - Expectorant activity
  - Lipid lowering activity
  - PAF antagonistic activity
  - Antidepressant activity
- The amount of barbaloin present in Aloe vera is
  - <1%
  - 3.5-4%
  - 1-1.5%
  - 2-2.5%
- Sildenafil is used for treatment of one of the following Disorders:
  - Systolic hypertension
  - Unstable angina
  - Pulmonary hypertension
  - Hypertension due to eclampsia
- Cardiac glycosides have the following configuration in the aglycone part of the steroid nucleus
  - 5 $\alpha$ , 14 $\alpha$ -
  - 5 $\alpha$ , 14 $\beta$ -
  - 5 $\beta$ , 14 $\alpha$
  - 5 $\beta$ , 14 $\beta$ -
- Quassia wood is adulterated with
  - Brucea antidysenterica*
  - Cassia angustifolia*
  - Cinnamomum zeylanicum*
  - Cephaelis ipecacuanaha*
- Eugenol is present in
  - Fennel
  - Tuki
  - Cardamom
  - Coriander
- Which one of the following drugs is prescribed for the treatment of Philadelphia chromosome positive patients with chronic myeloid Leukemia?
  - Pentostatin
  - Methotrexate
  - Imatinib
  - L-Asparaginase
- Which of the following monoclonal antibodies is prescribed for patients with nonHodgkin's Lymphoma
  - Infliximab
  - Abciximab
  - Gemtuzumab
  - Rituximab
- Identify the drug which is **NOT** used in the treatment of malaria caused by *Plasmodium falciparum*:
  - Artemisinin
  - Primaquine
  - Quinine
  - Mefloquine
- Which one of the following drugs does **NOT** act through G-Protein coupled receptors
  - Epinephrine
  - Insulin
  - Dopamine
  - TSH
- Which one of the following drugs is most effective in preventing transmission of HIV virus from the mother to the foetus
  - Lamivudine
  - Zidovudine
  - Indinavir
  - Ribavirin
- Improvement of memory in Alzheimer's disease is brought about by drugs which increase transmission in
  - Cholinergic receptors
  - Dopaminergic receptors
  - GABAergic receptors
  - Adrenergic receptors

14. Which of the following non-opioid analgesic is a prodrug  
 (a) Piroxicam (b) Celecoxib (c) Nabumetone (d) Ketorolac
15. Which one of the following drugs is **NOT** a typical anti-psychotic agent  
 (a) Chlorpromazine (b) Haloperidol (c) Risperidone (d) Flupentixol
16. Which one of the followings is a plasminogen activator  
 (a) Tranexamic acid (b) Streptokinase (c) Aminocaproic acid (d) None
17. Myasthenia gravis is diagnosed with improved neuromuscular function by using  
 (a) Donepezil (b) Edrophonium (c) Atropine (d) Pancuronium
18. Which one of the following drugs specifically inhibits calcineurin in the activated T-Lymphocytes  
 (a) Daclizumab (b) Prednisone (c) Sirolimus (d) Tacrolimus
19. The chemical behaviour of morphine alkaloid is  
 (a) Acidic (b) Basic (c) Neutral (d) Amphoteric
20. At physiological pH the following compound would be MOSTLY in the



- (a) Cationic form (b) Unionized form  
 (c) Zwitterionic form (d) Anionic form
21. Which one of the followings is used as a mood stabilizer for bipolar disorder and also in certain epileptic convulsions?  
 (a) Phenytoin (b) Lithium (c) Sodium valproate (d) Fluoxetine
22. An isosteric replacement for carboxylic acid group is  
 (a) Pyrrole (b) Isoxazole (c) Phenol (d) Tetrazole
23. The given antibiotic is an example of ansamycins  
 (a) Roxythromycin (b) Adriamycin (c) Aureomycin (d) Rifamycin
24. For glyburide, all of the following metabolic reactions are logical EXCEPT  
 (a) O-demethylation (b) Aromatic oxidation  
 (c) Benzylic hydroxylation (d) Amide hydrolysis
25. The effects observed following systemic administration of levodopa in the treatment of Parkinsonism has been attributed to its catabolism to dopamine. Carbidopa, can markedly increase the proportion of levodopa that crosses the bloodbrain barrier by  
 (a) Increasing penetration of levodopa through BBB by complexation with it  
 (b) Decreasing peripheral metabolism of levodopa  
 (c) Decreasing metabolism of levodopa in the CNS  
 (d) Decreasing clearance of levodopa from the CNS

26. Ethambutol molecule has
- (a) Two chiral centers and 3 stereoisomers (b) Two chiral centers and 4 stereoisomers  
(c) Two chiral centers and 2 stereoisomers (d) One chiral center and 2 stereoisomers
27. A compound will be sensitive towards IR radiation only when one of the following properties undergo transition on
- (a) Polarizability (b) Dielectric constant  
(c) Dipole moment (d) Refractivity
28. X-ray crystallographic analysis of an optically active compound determines its
- (a) Optical rotatory dispersive power (b) Absolute configuration  
(c) Relative configuration (d) Optical purity
29. Which one of the following statements is **WRONG**
- (a) A singlet or triplet state may result when one of the electrons from the HOMO is excited to higher energy levels  
(b) In an excited singlet state, the spin of the electron in the higher energy orbital is paired with the electron in the ground state orbital  
(c) Triplet excited state is more stable than the singlet excited state  
(d) When the electron from the singlet excited state returns to ground state, the molecule always shows fluorescence phenomenon. <http://www.xamstudy.com>
30. Aminotransferases usually require the following for their activity
- (a) Niacinamide (b) Vitamin B<sub>12</sub>  
(c) Pyridoxal phosphate (d) Thiamine
31. Purity of water can be assessed by determining one of its following properties instrumentally
- (a) pH (b) Refractivity  
(c) Viscosity (d) Conductivity
32. Which one of the following statements is **WRONG**
- (a) Carbon NMR is less sensitive than proton NMR  
(b) <sup>12</sup>C nucleus is not magnetically active  
(c) Both <sup>13</sup>C and <sup>1</sup>H have same spin quantum numbers  
(d) The gyromagnetic ratio of <sup>1</sup>H is lesser than that of <sup>12</sup>C
33. In the TCA cycle, at which of the following enzyme-catalyzed steps, incorporation of elements of water into an intermediate of the cycle takes place
- (a) Citrate synthase (b) Aconitase  
(c) Maleate dehydrogenase (d) Succinyl Co-A synthase
34. Humectants added in cosmetic preparations generally act by
- (a) Hydrogen bond formation (b) Covalent bond formation  
(c) Complex formation (d) The action of London forces
35. In the mixing of thymol and menthol the following type of incompatibility occurs
- (a) Chemical incompatibility (b) Therapeutic incompatibility  
(c) Physical incompatibility (d) Tolerance incompatibility

36. Bloom strength is used to check the quality of
- (a) Lactose (b) Ampoules  
(c) Hardness of tablets (d) Gelatin
37. The characteristic of non-linear pharmacokinetics include
- (a) Area under the curve is proportional to the dose  
(b) Elimination half-life remains constant,  
(c) Area under the curve is not proportional to the dose  
(d) Amount of drug excreted through remains constant
38. In the Drugs and Cosmetics Act and Rules, the Schedule relating to GMP is
- (a) Schedule M (b) Schedule C (c) Schedule Y (d) Schedule H
39. Thioglycolic acid-like compounds have applications in following type of cosmetic formulations
- (a) Depilatory preparations (b) Epilatory preparations  
(c) Vanishing creams (d) Skin tan preparations
40. Which one of the following is a flocculating agent for a negatively charged drug
- (a) Aluminium chloride (b) Bentonite  
(c) Tragacanth (d) Sodium biphosphate
41. The healing agent used in hand creams is
- (a) Soft paraffin (b) Urea (c) Bees wax (d) Stearyl alcohol
42. Measurement of inulin renal clearance is a measure for
- (a) Effective renal blood flow (b) Renal drug excretion rate  
(c) Active renal secretion (d) Glomerular filtration rate
43. Highly branched three dimensional macromolecules with controlled structures with all bonds originating from a central core are known as
- (a) Cyclodextrins (b) Dextrans (c) Dendrimers (d) Liposomes
44. Which one of the following is the commonly used bulking agent in the formulation of freeze dried low dose drug products?
- (a) Sodium chloride (b) Mannitol (c) Starch (d) HPMC
45. The applicability of Noyes-Whitney equation is to describe
- (a) First order kinetics (b) Zero order kinetics  
(c) Mixed order kinetics (d) Dissolution rate
46. Which filler can **NOT** be used for the preparation of tablets for amine containing basic drugs to avoid discoloration of the tablets?
- (a) Dicalcium phosphate (b) Microcrystalline cellulose  
(c) Starch (d) Lactose
47. The ability of human eye using illuminated area to detect a particle is limited to
- (a) 0.4 micron (b) 25 micron (c) 50 micron (d) 10 microns

48. What quantities of 95 % v/v and 45 % v/v alcohols are to be mixed to make 800 mL of 65 % v/v alcohol?
- (a) 480 mL of 95 % and 320 mL of 45 % alcohol  
 (b) 320 mL of 95 % and 480 mL of 45 % alcohol  
 (c) 440 mL of 95 % and 360 mL of 45 % alcohol  
 (d) 360 mL of 95 % and 440 mL of 45 % alcohol
49. The role of borax in cold creams is
- (a) Anti-microbial agent (b) To provide fine particles to polish skin  
 (c) *In-situ* emulsifier (d) Antioxidant
50. Choose the right combination
- (a) Quinine, antimalarial, isoquinoline alkaloid  
 (b) Reserpine, antihypertensive, indole alkaloid  
 (c) Quantitative microscopy, stomatal number, myrrh  
 (d) Palmitic acid, salicylic acid, fatty acids
51. Triterpenoids are active constituents of
- (a) Jaborandi (b) Rhubarb (c) Stramonium (d) Brahmi
52. Alkaloids are **NOT** precipitated by
- (a) Mayer's reagent (b) Dragendorff Reagent  
 (c) Picric acid (d) Millon's reagent
53. Anisocytic stomata are present in
- (a) Senna (b) Digitalis (c) Belladonna (d) Coca
54. *Bacopa monnieri* plant belongs to the family
- (a) Scrophulariaceae (b) Leguminosae  
 (c) Polygalaceae (d) Rubiaceae
55. Tropane alkaloids are **NOT** present in
- (a) *Datura stramonium* (b) *Erythroxylum coca*  
 (c) *Duboisia myoporoides* (d) *Lobelia inflata*
56. Guggul lipids are obtained from
- (a) *Commiphora molmol* (b) *Boswellia serrata*  
 (c) *Commiphora wightii* (d) *Commiphora abyssinica*
57. An example of N-glycoside is
- (a) Adenosine (b) Sinigrin (c) Rhein-8-glucoside (d) Aloin
58. One mg of *Lycopodium* spores used in quantitative microscopy contains an average of
- (a) 94,000 spores (b) 92,000 spores  
 (c) 90,000 spores (d) 91,000 spores
59. Select the correct combination of drugs for the treatment of patients suffering from Hepatitis C
- (a) Interferon with Ribavirin (b) Interferon with Zidovudine  
 (c) Interferon with Stavudine (d) Interferon with Lamivudine



60. **ALISKIREN** acts by
- Inhibiting the conversion of Angiotensin I to II
  - Inhibiting the release of rennin
  - Inhibiting the binding of Angiotensin II to the receptor
  - Inhibiting the action of aldosterone
61. **Digitalis toxicity is enhanced by co-administration of**
- Potassium
  - Quinidine
  - Diuretics
  - Antacids
62. **The rate limiting step in cholesterol biosynthesis is one of the followings:**
- LDL-receptor concentration
  - VLDL secretion
  - Mevalonic acid formation
  - Co-enzyme A formation
63. **Which one of the following drugs is withdrawn from the market due to *torsade de pointes***
- Chlorpromazine
  - Astemizole
  - Haloperidol
  - Domperidone
64. **Ganciclovir is mainly used for the treatment of infection caused by**
- Cytomegalovirus
  - Candida albicans
  - Herpes zoster virus
  - Hepatitis B virus
65. **Identify the one rational combination which has clinical benefit:**
- Norfloxacin – Metronidazole
  - Alprazolam - Paracetamol
  - Cisapride – Omeprazole
  - Amoxicillin - Clavulanic acid
66. **Stevens Johnson syndrome is the most common adverse effect associated with one of the following category of drugs**
- Sulphonamides
  - Macrolides
  - Penicillins
  - Tetracyclines
67. **Amitriptyline is synthesized from the following starting material**
- Phthalic anhydride
  - Terephthalic acid
  - Phthalamic acid
  - Phthalimide
68. **The common structural feature amongst the three categories of anti-convulsant drugs Barbiturates, succinimides and hydantoins is**
- Ureide
  - Imidazolidinone
  - Dihydropyrimidine
  - Tetrahydropyrimidine
69. **Nicotinic action of acetylcholine is blocked by the drug**
- Atropine
  - Carvedilol
  - Neostigmine
  - d-Tubocurarine
70. **Chemical nomenclature of procaine is**
- 2-Diethylaminoethyl 4-aminobenzoate
  - N,N-Diethyl 4-aminobenzoate
  - 4-Aminobenzamidoethyl amine
  - 4-Amino-2-diethylaminoethyl benzoate



71. Barbiturates with substitution at the following position possess acceptable hypnotic activity:
- (a) 1,3-Disubstitution (b) 5,5-Disubstitution  
(c) 1,5-Disubstitution (d) 3,3-Disubstitution
72. Selective serotonin reuptake inhibitor is
- (a) Imipramine (b) Iproniazide  
(c) Fluoxetine (d) Naphazoline
73. Proton pump inhibitors like omeprazole and lansoprazole contain the following ring system:
- (a) Pyrimidine (b) Benzimidazole  
(c) Benzothiazole (d) Oxindole
74. A metabolite obtained from *Aspergillus terreus* that can bind very tightly to HMG CoA reductase enzyme is
- (a) Fluvastatin (b) Cerivastatin  
(c) Lovastatin (d) Somatostatin
75. Cyclophosphamide as anticancer agent acts as
- (a) Alkylating agent before metabolism (b) Alkylating agent after metabolism  
(c) Phosphorylating agent after metabolism (d) DNA intercalating agent
76. Artemisinin contains the following group in its structure
- (a) An endoperoxide (b) An exoperoxide  
(c) An epoxide (d) An acid hydrazide
77. Indicate the HPLC detector that is most sensitive to change in temperature
- (a) PDA detector (b) Refractive Index detector  
(c) Electrochemical detector (d) Fluorescence detector
78. One of the following statements is NOT true
- (a) Accuracy expresses the correctness of measurement  
(b) Precision represents reproducibility of measurement  
(c) High degree of precision implies high degree of accuracy also  
(d) High degree of accuracy implies high degree of precision also
79. In thiazides following substituent is essential for diuretic activity
- (a) Chloro group at position 6 (b) Methyl group at position 2  
(c) Sulphamoyl group at position 7 (d) Hydrophobic group at position 3
80. Streptomycin can NOT be given orally for treatment of tuberculosis because
- (a) It gets degraded in the GIT (b) it causes severe diarrhoea  
(c) It causes metallic taste in the mouth (d) it is not absorbed from the GIT
81. In organic molecules, fluorescence seldom results from absorption of UV radiation of wavelengths lower than
- (a) 350 nm (b) 200 nm (c) 300 nm (d) 250 nm
82. Glass transition temperature is detected through
- (a) X-Ray diffractometry (b) Solution calorimetry  
(c) Differential scanning calorimetry (d) Thermogravimetric analysis

83. In Gas-Liquid Chromatography, some of the samples need to be derivatized in order to increase their
- (a) Volatility (b) Solubility  
(c) Thermal conductivity (d) Polarizability
84. Oxidative phosphorylation involves
- (a) Electron transport system  
(b) Substrate level phosphorylation  
(c) Reaction catalyzed by succinic thiokinase in TCA cycle  
(d) None of the above
85. Coulter counter is used in determination of
- (a) Particle surface area (b) Particle size  
(c) Particle volume (d) All of the above
86. Drugs following one compartment open model pharmacokinetics eliminate
- (a) Bi-exponentially (b) Tri-exponentially  
(c) Non-exponentially (d) Mono-exponentially
87. The temperature condition for storage of drug products under cold temperature is given As:
- (a) Temperature between 8°C and 25°C (b) temperature below 20°C  
(c) Temperature at 0°C (d) temperature between 2°C and 8°C
88. Many xenobiotics are oxidized by cytochrome P450 in order to
- (a) Increase their biological activity  
(b) Increase their disposition in lipophilic compartments of the body  
(c) Increase their aqueous solubility <http://www.xamstudy.com>  
(d) All of the above
89. The following protein/polypeptide has a quaternary structure
- (a) cc-Chymotrypsin (b) Hemoglobin  
(c) Insulin (d) Myoglobin
90. Drugs in suspensions and semi-solid formulations always degrade by
- (a) First order kinetics (b) Second order kinetics  
(c) Zero order kinetics (d) Non-linear kinetics
91. In nail polish, following polymer is used as a film-former
- (a) Nitrocellulose (b) Polylactic acid  
(c) Hydroxypropyl methylcellulose (d) Cellulose acetate phthalate
92. Rabies vaccine (living) is prepared using
- (a) Sheep blood (b) Mice lymph  
(c) Horse plasma (d) Fertile eggs
93. A drug (200 mg dose) administered in tablet form and as intravenous injection (50 mg dose) showed AUG of 100 and 200 microgram hr/mL, respectively. The absolute availability of the drug through oral administration is
- (a) 125% (b) 250 % (c) 12.5% (d) 1.25%
94. Geriatric populations should be included in the following Phase of clinical trials
- (a) Phase I (b) Phase II (c) Phase III (d) Phase IV

95. Class 100 area is referred to  
 (a) Manufacturing area (b) Aseptic area  
 (c) Clean room (d) Ware house
96. How many mL of a 1:500 w/v stock solution should be used to make 5 liters of 1:2000 w/v solution  
 (a) 750 mL (b) 1000 ml (c) 1250 mL (d) 1500 mL
97. The Volume of distribution of a drug administered at a dose of 300 mg and exhibiting 30 microgram /mL instantaneous concentration in plasma shall be  
 (a) 10 L (b) 100 L (c) 1.0 L (d) 0.10 L
98. It is required to maintain a therapeutic concentration of 10 microgram/mL for 12 hours of a drug having half life of 1.386 hr and Vd of 5 L. The dose required in a sustained release product will be  
 (a) 600 mg (b) 300 mg (c) 30 mg (d) 60 mg
99. Which one of the following is **NOT** an ex-officio member of Pharmacy Council of India  
 (a) The Director General of Health Services  
 (b) The Director of Central Drugs Laboratory  
 (c) The Drugs Controller General of India  
 (d) The Director of Pharmacopoeia Laboratory
100. In which of the following techniques the sample is kept below triple point  
 (a) Lyophilization (b) Spray drying  
 (c) Spray congealing (d) Centrifugation

*End of paper*

**ANSWER KEY GPAT 2010**

1-b	2-c	3-b	4-c	5-d	6-b	7-b	8-c	9-d	10-b
11-b	12-b	13-a	14-c	15-c	16-b	17-b	18-d	19-b	20-d
21-b	22-d	23-d	24-b	25-b	26-b	27-c	28-b	29-c	30-c
31-d	32-d	33-c	34-a	35-c	36-d	37-c	38-a	39-a	40-a
41-a	42-d	43-c	44-b	45-d	46-d	47-d	48-b	49-a	50-b
51-d	52-d	53-c	54-a	55-d	56-c	57-a	58-a	59-b	60-b
61-b	62-c	63-b	64-a	65-d	66-a	67-b	68-a	69-d	70-a
71-b	72-c	73-b	74-c	75-b	76-a	77-b	78-c	79-c	80-d
81-a	82-c	83-d	84-a	85-d	86-d	87-d	88-d	89-b	90-c
91-a	92-d	93-c	94-c	95-b	96-c	97-a	98-a	99-d	100-a

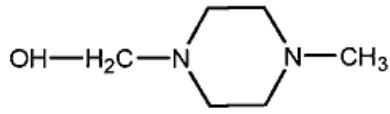
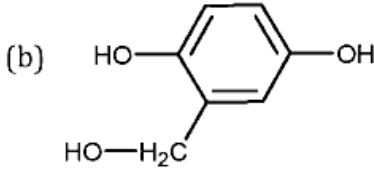
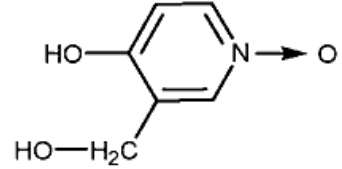
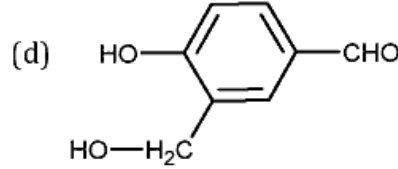
# GPAT QUESTION PAPER 2009 WITH ANSWER KEY

## PHARMACEUTICAL SCIENCE

Time : 3 hours

Maximum Marks : 150

### (Q. 1 - 20) CARRY ONE MARK EACH

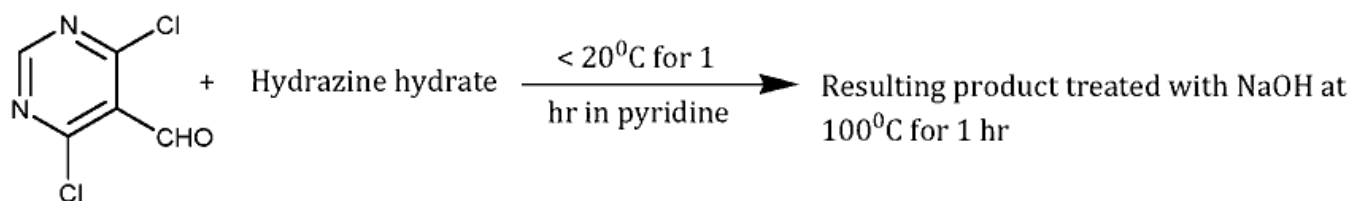
- Different species of Ephedra can be identified by observing the nature of
  - Inner surface
  - Outer surface
  - Trichomes
  - Scaly leaves
- Indian Rhubarb can be distinguished from Rhapontic Rhubarb by the fluorescence it emits under UV light. Indian Rhubarb gives
  - Deep yellow
  - Deep violet
  - Orange
  - Pale green
- Genetically modified species of Papaver namely *Papaver bracteatum* and *Papaver orientale* contain the predominant alkaloid
  - Morphine
  - Codeine
  - Thebaine
  - Narcotine
- Increased risk of atherosclerosis is associated with decreased serum levels of
  - LDL
  - HDL
  - Triglycerides
  - VLDL
- A peptide hormone which inhibits bone resorption and given as nasal spray is
  - Cortisol
  - Alendronate
  - Calcitonin
  - Calcitriol
- An inorganic ion which is used prophylactically in bipolar depression is
  - Valproate
  - Lithium
  - Chromium
  - Valium
- A  $\beta$ -lactamase inhibitor which contains an 1-oxopenam structure is
  - Tazobactam sodium
  - Clavulanate potassium
  - Sulbactam sodium
  - Thienamycin
- Salbutamol is prepared from
  - 
  - 
  - 
  - 
- Antihypothrombinemic effect of one stereochemical form is two to five times more than others
  - (S)-(+)-Warfarin
  - R-(+)-Warfarin
  - (S)-(-)-Warfarin
  - (RS)-Warfarin

10. Some of the organic reactions are catalysed by a product obtained from starch ontreatment with amylase from *Bacillus macerans*. It is  
 (a) Amylopectin (b) Amylose (c) Cellulose (d) Cyclodextrin
11. Florentine receiver is used to separate the liquids based on  
 (a) Molecular weight (b) Sedimentation rate  
 (c) Density (d) Freezing point
12. The official dissolution test apparatus contains cylindrical vessel and lower edge of the blade is positioned from inside bottom vessel at  
 (a) 18 to 22 mm (b) 23 to 27 mm  
 (c) 20 to 24 mm (d) 25 to 29 mm
13. As per Drugs and Cosmetics Act and Rules, the Good Manufacturing Practice is included under schedule  
 (a) W (b) P (c) S (d) M
14. A substance used for modification of silica gel for reversed-phase TLC is  
 (a) Benzene (b) Glycerine  
 (c) Silicone oil (d) Ether
15. In IR spectrum, the functional group region is from  
 (a)  $4000\text{ cm}^{-1}$  to  $900\text{ cm}^{-1}$  (b)  $4000\text{ cm}^{-1}$  to  $1400\text{ cm}^{-1}$   
 (c)  $1400\text{ cm}^{-1}$  to  $900\text{ cm}^{-1}$  (d)  $40000\text{ cm}^{-1}$  to  $660\text{ cm}^{-1}$
16. The equation  $E = E^{\circ} + \frac{RT}{nF} \ln aM^{n+}$  is used to measure the  
 (a) Conductance (b) Potential difference  
 (c) Resistance (d) Current
17. Intermediates in the biosynthesis of cholesterol are  
 (a) Mevalonic acid and isopentenyl pyrophosphate  
 (b) Mevalonic acid and aldosterone  
 (c) Isoprenaline and aldosterone  
 (d) Isopranaline and isopentenyl pyrophosphate
18. A naturally occurring amino acid which does not have a chiral centre is  
 (a) Glycine (b) Alanine  
 (c) Tryptophan (d) Tyrosine
19. A given Gram-positive bacterium is differentiated from Gram-negative by Gramstaining. This is because its cell wall contains  
 (a) Lysozyme (b) Teichoic acid  
 (c) Membrane proteins (d) Lipid A
20. The drug which increases the plasma concentration of digoxin by a pharmacokinetic mechanism is  
 (a) Lidocaine (b) Captopril (c) Quinidine (d) Hydrochlorthiazide

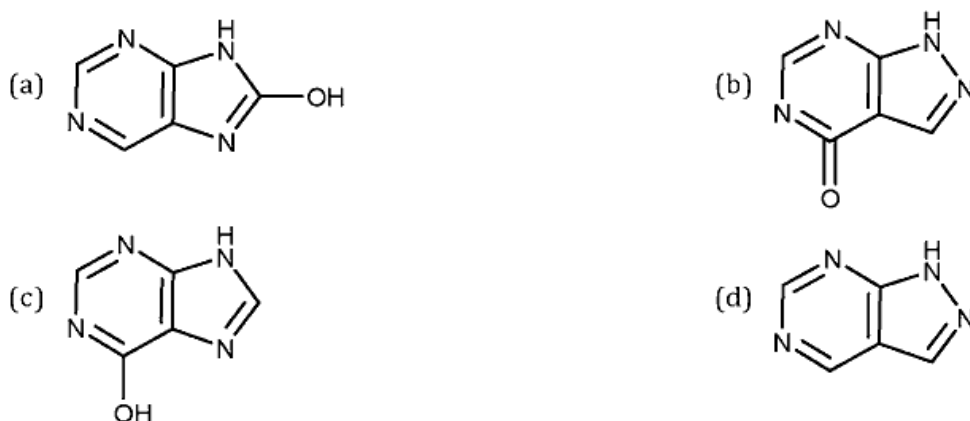
**Q. No. 21 – 56 Carry Two Marks Each**

21. Microscopic characters of ginger rhizome are
- Spindle shaped lignified fibers and sclereids
  - Cluster crystals of calcium oxalate and sclereids
  - Non-lignified vessels and sac shaped starch grains
  - Non-lignified fibers and sclereids
22. Klunge's test is for the identification of
- Barbaloin
  - Isobarbaloin
  - Aloniosides
  - Aloesin
23. 3, 4 Benzpyrene present in cigarette smoke reduces the therapeutic activity of Diazepam by
- Altering excretion
  - Binding to plasma proteins
  - Inhibiting metabolism
  - Increasing the activity of liver microsomal enzymes
24. An NMDA antagonist introduced for treatment of Alzheimer's disease is
- Dopamine
  - Nor-epinephrine
  - Serotonin
  - Memantine

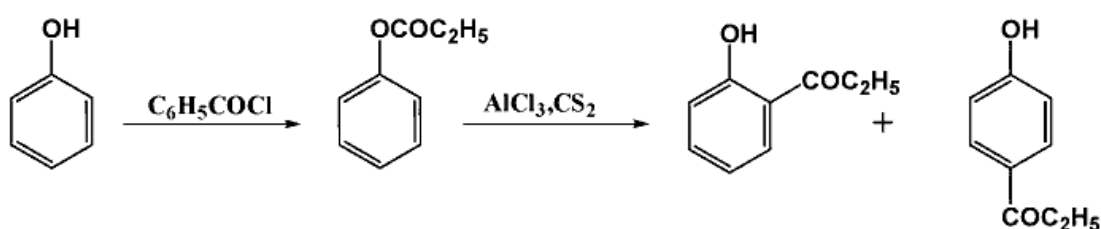
25.



gave an effective product for the treatment of Gout. Identity



26. Phenol, an antiseptic when treated as follows



Gave the above two phenolic ketones. The Reaction is

- Hofmann rearrangement
- Fries Rearrangement
- Kolbe's reaction
- Reimer-Tiemann Reaction



27. The quantity of drug required to make a 2% w/w solution in 240ml of alcohol is(The density of alcohol is 0.816 g/ml)
- (a) 1.632g                      (b) 2.400g                      (c) 4.000g                      (d) 4.800g
28. In multistation punching machine, the upper as well as lower punches are connected by
- (a) Cams                      (b) Turrets                      (c) Wire meshes                      (d) Revolving belts
29. As per the Drugs and Cosmetics Act, the HEPA filters are required to filter the air in the pharmaceutical manufacturing unit Grade A filter is used for
- (a) Aseptic preparation and filling  
(b) Background room used for preliminary activities  
(c) Filtering liquid preparations  
(d) Handling of components after washing
30. The deflection of positive ions formed in a mass spectrometer by electric and magnetic fields depends upon its
- (a) Mass    (b) Charge  
(c) Velocity    (d) Mass, charge and velocity
31. Cyclohexane can be used as a solvent in UV spectrophotometric analysis because
- (a) It has a ring structure  
(b) Energy requirement for  $\sigma - \sigma^*$  is in the range of 120-200nm  
(c) It is volatile  
(d) It is immiscible with water
32. Quaternary structure in protein molecules refers to the
- (a) Arrangement of multiple domains in a single polypeptide chain  
(b) Specific arrangement of multiple subunits in multi-subunit proteins  
(c) Formation of molten globules      <http://www.xamstudy.com>  
(d) Protein folding in single subunit proteins
33. Interleukins are
- (a) Polypeptide cytokines important in the inflammatory cascade  
(b) Prostaglandins that account for gastrointestinal disorders  
(c) Enkephalins which are specific for asthma  
(d) Dipeptides which have antimicrobial properties
34. Phase I clinical studies of a drug under development is generally carried out on
- (a) At least 10,000 people from different ethnic communities and a wide range of age groups  
(b) A medium sized group of 500-1000 patients suffering from the disease for which the drug is being developed  
(c) A small group of 20-100 healthy male and female volunteers  
(d) Reliable in-vitro cell-lines derived from people suffering with the disease

35. A young patient complains that he gets severe shortness of breath whenever he takes aspirin for headache. Increased levels of a substance responsible for aspirin hypersensitivity is
- (a) Prednisone (b) Prostacycline  
(c) Ibuprofen (d) Leukotriene LTC<sub>4</sub>

**Q. 36 to 50 are Matching exercises.**

**Match group I with Group II and Identify the correct combinations**

**36. Group I**

Glycoside

- (P) Gentisin  
(Q) Genistein  
(R) Apigenin  
(S) Quercetin  
(a) P-4, Q-3, R-1, S-2  
(c) P-3, Q-4, R-2, S-1

**37. Group I**

Bark Diagnostic

- (P) Kurchi  
  
(Q) Cascara  
  
(R) Cinnamon  
  
(S) Cinchona  
(a) P-2, Q-1, R-4, S-3  
(c) P-3, Q-4, R-2, S-1

**38. Group I**

Drug

- (P) Levofloxacin  
(Q) Caspofungin  
  
(R) Aztreonam  
(S) Rifabutin

**Group II**

Type

1. Flavonol  
2. Flavone  
3. Xanthone  
4. Isoflavon  
(b) P-1, Q-2, R-4, S-3  
(d) P-2, Q-1, R-3, S-4

**Group II**

Microscopical Characters

1. Heavily lignified phloem fibres with Y-shaped pits, secretory canals, microcrystals of calcium oxalate  
2. Pericycle with stone cells having horse-shoe shaped thickening, oil cells, minute needles of calcium oxalate  
3. Alternating layers of stone cells and phloem, nonlignified pericyclic fibres, prismatic crystals of calcium oxalate  
4. Wavy medullary rays, groups of heavily lignified sclereids, crystal sheath of calcium oxalate  
(b) P-4, Q-3, R-1, S-2  
(d) P-1, Q-2, R-3, S-4

**Group II**

Mechanism of action is by inhibition of

1. DNA dependent RNA polymerase  
2. Topoisomerase II (DNA gyrase) the enzyme that Produces a negative supercoil  
3. The synthesis of b(1-2) glycan  
4. Cell wall synthesis preferentially binding to a Specific penicillin binding protein

(a) P-2,Q-3,R-4,S-1

(c) P-4,Q-1,R-2,S-3

39. **Group I**

Drug

(P) Granisetron

(Q) Pirenzepine

(R) Acebutalol

(S) Baclofen

(a) P-1,Q-2,R-3,S-4

(c) P-2,Q-3,R-4,S-1

40. **Group I**

Drug

(P) Chlorpromazine

(Q) Thioridazine

(R) Diazepam

(S) Thiopentone

(a) P-4,Q-1,R-2,S-3

(c) P-4,Q-3,R-2,S-1

41. **Group I**

Drug

(P) Diprophylline

(Q) Ethophylline

(R) Etamiphylline

(S) Proxiphylline

(a) P-3, Q-2, R-4, S-1

(c) P-1, Q-3, R-2, S-4

(b) P-3,Q-4,R-1,S-2

(d) P-1,Q-2,R-3,S-4

**Group II**

Receptor agonist/antagonist

1.  $\beta_1$  adrenergic receptor antagonist

2. GABA agonist

3.  $5HT_3$  antagonist

4. M1 antagonist

(b) P-3,Q-4,R-1,S-2

(d) P-4,Q-1,R-2,S-3

**Group II**

Biotransformation

1. S-oxidation

2. Microsomal hydroxylation

3. Desulphuration

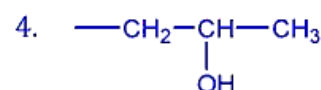
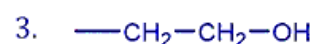
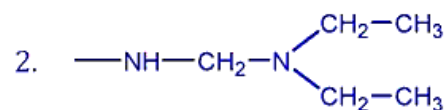
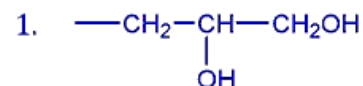
4. N-dealkylation

(b) P-2,Q-3,R-4,S-1

(d) P-4,Q-2,R-3,S-1

**Group II**

7-Substitution in 1,3-dimethyl xanthine with



(b) P-2, Q-4, R-3, S-1

(d) P-1, Q-4, R-3, S-2

42. **Group I**

Equipment

- (P) Cascade Impactor
- (Q) Tag Open Cup apparatus
- (R) Pycnometer
- (S) Rheometer
- (a) P-3, Q-1, R-4, S-2
- (c) P-4, Q-2, R-3, S-1

43. **Group I**

Classification

- (P) Ionic surfactant
- (Q) Nonionic surfactant
- (R) Non surfactant
- (S) Chelating agent
- (a) P-3, Q-2, R-1, S-4
- (c) P-3, Q-4, R-1, S-2

44. **Group I**

Transdermal drug delivery system

- (P) Membrane modulated system
- (Q) Diffusion controlled system
- (R) Matrix dispersion system
- (S) Microreservoir system
- (a) P-2, Q-4, R-1, S-3
- (c) P-1, Q-4, R-2, S-3

45. **Group I**

Term used

- (P) Chromophore
- (Q) Blue shift
- (R) Auxochrome
- (S) Red shift
- (a) P-4, Q-3, R-1, S-2
- (c) P-1, Q-2, R-3, S-4

**Group II**

To determine

- 1. Flash point
- 2. Sedimentation rate
- 3. Particle size
- 4. Density of liquid
- (b) P-1, Q-3, R-2, S-4
- (d) P-2, Q-3, R-1, S-4

**Group II**

Penetration enhancer

- 1. Terpenes
- 2. Polyoxyethylene-20-cetyl ether
- 3. Polyethylene-9-lauryl ether
- 4. Citric acid
- (b) P-2, Q-3, R-1, S-4
- (d) P-4, Q-2, R-3, S-1

**Group II**

Method of penetration

- 1. Drug is homogenously dispersed in polymer and then moulded into a patch
- 2. Drug reservoir is encapsulated in rate controlling polymer patch
- 3. Drug is dispersed in hydrophilic polymer and then cross with lipophilic polymer by high shear mechanical force linked
- 4. Drug is directly dispersed in polymer patch
- (b) P-1, Q-2, R-3, S-4
- (d) P-4, Q-1, R-3, S-2

**Group II**

Explanation

- 1. Amino group
- 2. Increase in wavelength of absorption
- 3. Decrease in wavelength of absorption
- 4. Carbonyl group
- (b) P-3, Q-1, R-2, S-4
- (d) P-2, Q-4, R-3, S-1

46. **Group I**

Symbol

(P) v

(Q) id

(R)  $\delta$

(S)  $\rho$

(a) P-3, Q-4, R-1, S-2

(c) P-4, Q-3, R-2, S-1

47. **Group I**

Type of inhibitor

(P) Competitive inhibitors

(Q) Non-competitive inhibitors

(R) Uncompetitive inhibitors

(S) Suicide inhibitors

(a) P-3, Q-2, R-1, S-4

(c) P-4, Q-1, R-3, S-2

48. **Group I**

Process

(P) Post translation modification

(Q) DNA repair

(R) Control of prokaryotic transcription

(S) Protein degradation

(a) P-1, Q-4, R-2, S-3

(c) P-3, Q-2, R-4, S-1

49. **Group I**

Microorganism

(P) *Corynebacterium diphtheriae*

(Q) *Streptococcus pyogenes*

(R) *Staphylococcus aureus*

(S) *Streptomyces viridochroma*

(a) P-3, Q-4, R-2, S-1

(c) P-2, Q-4, R-1, S-3

**Group II**

Description

1. Specific resistance

2. Chemical shift

3. Diffusion current

4. Frequency

(b) P-2, Q-1, R-4, S-3

(d) P-1, Q-2, R-4, S-3

**Group II**

Description

1. Have affinity only for the [E-S] complex and not for the free [E]

2. Binding of the inhibitor and that of the natural substrate are mutually exclusive

3. Ultimately binds covalently to the enzyme

4. Binds with the same affinity to [E] and [E-S]

(b) P-1, Q-3, R-2, S-4

(d) P-2, Q-4, R-1, S-3

**Group II**

Required molecules

1. Signal peptidase

2. Sigma factor

3. Proteasome complex

4. Photolyase

(b) P-2, Q-3, R-1, S-4

(d) P-2, Q-1, R-3, S-4

**Group II**

Typical characteristics

1. Cells divide in three planes in an irregular pattern, Producing 'bunches'

2. Cells are lined side by side like matchsticks and at angles to one another

3. Long, branched, multinuclear filaments called 'hyphae'

4. Cells divide in one plane and remain attached to form chain

(b) P-4, Q-1, R-2, S-3

(d) P-3, Q-2, R-1, S-4

50. **Group I**

Condition

- (P) Agranulocytosis
- (Q) Anisocytosis
- (R) Aplastic anemia
- (S) Hemolytic anemia

- (a) P-2, Q-3, R-4, S-1
- (c) P-1, Q-2, R-4, S-3

**Group II**

Description

- 1. Reduced lifespan of erythrocytes
- 2. Lack of neutrophils
- 3. Abnormal variation in RBC size
- 4. Depression of synthesis of all cell types in bone marrow

- (b) P-2, Q-4, R-3, S-1
- (d) P-4, Q-2, R-1, S-3

**Common Data Questions: 51 & 52**

**Transgenic plants are developed by genetic engineering techniques**

51. **The method involves**

- (a) Individual genes from one species inserted into another; the offspring will contain copies of new gene.
- (b) By crossing two species or varieties differing at least in one set of characters
- (c) Exposing the plant tissue to radiation
- (d) Bioproduction of natural compounds under aseptic conditions

52. **In the production of transgenic plants, the gene transfer is carried out by**

- (a) Induction of meristematic primordia
- (b) Gel filtration
- (c) Clonal propagation
- (d) Silicon carbide whiskers

53. **In the design of Captopril, the**

- (a) -COOH group is introduced in proline to enhance the binding capability at the receptor site
- (b) -SH group is introduced to enhance the binding capability of the drug with cobalt ion of ACE
- (c) -SH group is introduced to enhance the binding to the zinc ion of ACE
- (d) -COOH and -SH groups to introduce hydrophilic pockets at the receptor site

54. **Captopril IP is assayed by titration**

- (a) Against 0.1N sodium hydroxide using phenolphthalein indicator
- (b) Of a solution in dimethylformamide with 0.1M of tetrabutyl ammonium hydroxide
- (c) Of a solution in anhydrous formic acid and acetic anhydride with 0.1N perchloric acid
- (d) Of a solution containing 1.8M sulphuric acid and potassium iodide with 0.025M potassium iodate using starch solution



### Common Data Questions: 55 & 56

55. Liposomes are used as carriers for drugs and macromolecules in pharmaceutical formulations. They are
- (a) Phospholipids dispersed gently in aqueous medium to obtain multilamellar vesicles
  - (b) Hydrophilic or lipophilic polymer matrix with a drug reservoir
  - (c) A shallow compartment moulded from a drug impermeable system and rate controlling polymeric membrane
  - (d) Microporous membrane made from ethylene / vinyl acetate polymer
56. They can interact by different mechanisms
- (a) Biological fluid diffuses into the matrix and causes erosion of polymer
  - (b) Endocytosis by phagocytic cells of the reticuloendothelial system such as macrophages and Neutrophils
  - (c) Magnetic beads dispersed throughout the polymer matrix. On exposure the drug is released slowly by diffusion <http://www.xamstudy.com>
  - (d) Receptor binding mediated by the peptide

### Linked Answer Questions: (Q) 57 to (Q) 60 Carry Two Marks Each

Statement for Linked Answer Questions: 57 & 58

**A Chinese tree *Camptotheca acuminata* is useful in cancer chemotherapy**

57. The camptothecin present in the plant and useful in treating ovarian cancer is
- (a) Etoposide
  - (b) Vincristine
  - (c) Paclitaxel
  - (d) Topotecan
58. The drug selected above acts by
- (a) Inhibiting topoisomerase I
  - (b) Inhibiting topoisomerase II
  - (c) Inhibiting thymidylate synthase
  - (d) Forming hydrogen peroxide which generates free radicals

Statement for Linked Answer Questions: 59 & 60

**The compound A combined with X to get converted into B, in the presence of an appropriate enzyme**

59. The reaction can be described as
- (a) Bioactivation
  - (b) Glucuronide conjugation
  - (c) Beta-Oxidation
  - (d) Stereospecific glycine conjugation
60. The significance of the above reaction in drug therapy is that the reaction
- (a) Converts water soluble compound into a lipid soluble compound, thereby increasing its potency
  - (b) Converts an uncharged species into a charged species, increasing the shelf life of the compound
  - (c) Adds an ionic hydrophilic moiety, facilitating its urinary elimination
  - (d) Adds a bulky substituent to convert it into an active compound

*End of paper*

## ANSWER KEY GATE 2009

1-b	2-b	3-c	4-b	5-c	6-b
7-b	8-d	9-c	10-d	11-c	12-b
13-d	14-a	15-b	16-b	17-a	18-a
19-b	20-c	21-c	22-b	23-d	24-d
25-b	26-b	27-c	28-a	29-a	30-d
31-b	32-b	33-a	34-c	35-d	36-c
37-a	38-c	39-b	40-a	41-c	42-a
43-a	44-a	45-a	46-c	47-d	48-a
49-c	50-a	51-a	52-d	53-c	54-d
55-a	56-b	57-d	58-a	59-b	60-c

# GPAT QUESTION PAPER 2008 WITH ANSWER KEY

## PHARMACEUTICAL SCIENCE

Time : 3 hours

Maximum Marks : 150

### (Q. 1 - 20) CARRY ONE MARK EACH

- An antidiabetic drug Pioglitazone used in Type 2 diabetes acts by

(a) Decrease of glucose uptake in muscles                      (b) Increasing insulin sensitivity  
(c) Inhibiting intestinal  $\alpha$ -glucosidase                      (d) Stimulating insulin secretion
- An angiotensin-II receptor blocker useful in treating hypertension is

(a) Enalaprilat                      (b) Valsartan                      (c) Atenolol                      (d) Amlodipine
- Co-administration of NSAIDs with Warfarin may often lead to

(a) Antagonistic interaction  
(b) Interaction due to change in drug transport  
(c) Interaction due to disturbances in electrolyte balance  
(d) Additive or synergistic interaction
- Laminaria and Kelp are the principal genera, currently used for the industrial production of

(a) Carrageenans                      (b) Agar  
(c) Fucans                      (d) Alginic acid and alginates
- A transverse section of *Glycyrrhiza glabra* when treated with 80% sulphuric acid gave

(a) Deep yellow color                      (b) No reaction, but only charring  
(c) Deep blue color                      (d) Deep red color
- Microscopy of the bulbs of *Urginea indica* family Liliaceae shows

(a) Prisms of calcium oxalate                      (b) Calcium carbonate and silica  
(c) Rosettes of calcium oxalate                      (d) Raphides of calcium oxalate
- Streptomycin is a

(a) Di-acidic base possessing an aldehydic carbonyl group  
(b) Tri-acidic base possessing an aldehydic carbonyl group  
(c) Neutral compound possessing a ketonic group  
(d) Acid compound possessing a carboxyl group
- The antihistaminic with diphenyl methyl group is

(a) Methdilazine                      (b) Cyclizine hydrochloride  
(c) Pheniramine                      (d) Phenindamine
- Heterocyclic rings present in pilocarpine are

(a) Imidazole and Quinoline                      (b) Imidazole and Thiazole  
(c) Quinoline and phenanthrene                      (d) Imidazole and Dihydrofuran

10. The most important microbial virulence factor in etiology of meningitis is  
 (a) Exotoxin (b) Components of the capsule  
 (c) Coagulase (d) Hyaluronidase
11. Commonly used tetanus vaccine is produced by  
 (a) Treatment of the causative organism with heat or UV light and finally obtaining the toxoid  
 (b) Subculturing the virus at pH 10.4  
 (c) Artificially generating antibodies to viral glycoproteins  
 (d) Isolating the antigenicity genes from the causative organism
12. Which of the following equations is valid for standard B-DNA  
 (a)  $A + T = G + C$  (b)  $A + T = 2(G + C)$   
 (c)  $2(A + T) = 3(G + C)$  (d)  $A + G = T + C$
13. Clinical jaundice, typified by yellowing of the tissues is associated with elevated levels of  
 (a) Serum lysozyme (b) Serum bilirubin  
 (c) Serum creatinine (d) Serum g-glutamyl transferase
14. In NMR spectrometry, the chemical shift ( $\delta$ ) is expressed in  
 (a) Parts per million (b) Gauss (c) Tesla (d) Hertz
15. In chromatographic separation, the different species in the sample, undergo the process of  
 (a) Chemical interaction (b) Partition  
 (c) Volatilization (d) Ionization
16. A target material used in the production of X-rays is  
 (a) Potassium (b) Copper  
 (c) Aluminium (d) Sodium
17. The requirement and guidelines for clinical trials, import and manufacture of new drugs as per the Drugs & Cosmetics Rules is given under Schedule  
 (a) N (b) Y (c) A (d) B
18. The growth of large particles at the expense of smaller ones, as a result of a difference in the solubility of the particles of varying sizes, is termed as  
 (a) Interfacial phenomenon (b) Partitioning  
 (c) Erosive formulation (d) Ostwald ripening
19. Cyclic oligomers of glucose that form water soluble inclusion complexes, which are biocompatible and improve the bioavailability of drugs  
 (a) Chlorophyll (b) Polyethylene glycol  
 (c) Cross povidone (d) Cyclodextrin
20. 'Draves test' is associated with measuring the efficiency of  
 (a) Detergent (b) Witting agents  
 (c) Suspending agents (d) Adsorbent

**Q.21 to Q.75 CARRY TWO MARKS EACH.**

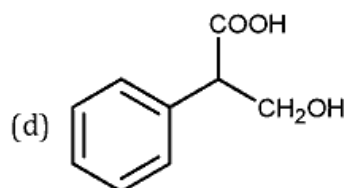
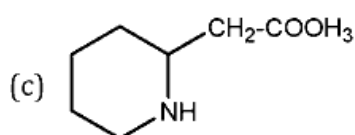
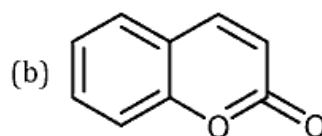
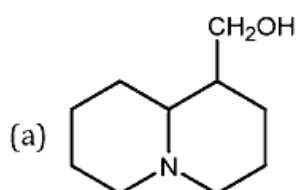
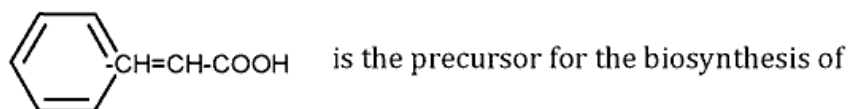
21. Effect of fibrates on blood lipids are mediated by

- (a) Inhibiting both synthesis and esterification of fatty acids
- (b) Their interaction with peroxime proliferator-activated receptors (PPARs)
- (c) Reducing the conversion of HMG-CoA to mevalonate
- (d) Sequestering bile acids

22. A cardioselective beta blocker with vasodilating properties is

- (a) Pindolo
- (b) Atenolol
- (c) Bisoprolol
- (d) Nebivolol

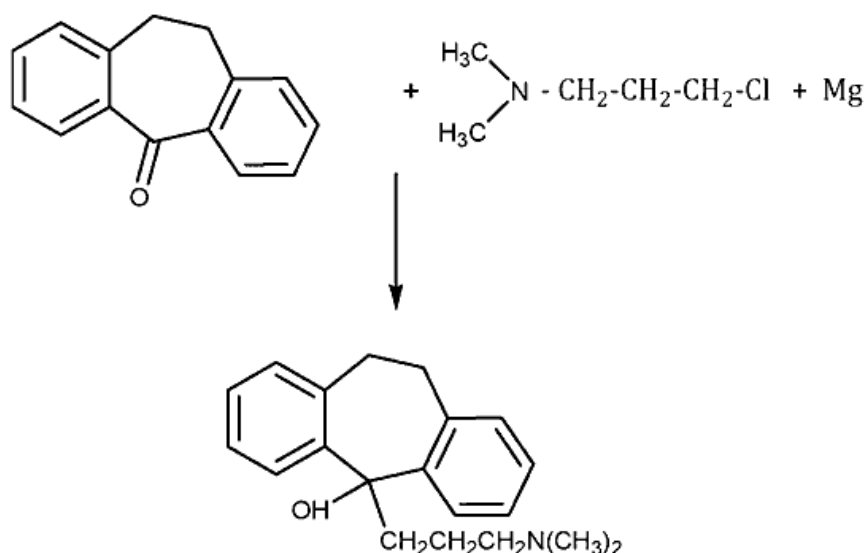
23. Choose the correct option



24. (-)-Hyoscyamine is

- (a) 15-20 times more active as a mydriatic than (+)-hyoscyamine
- (b) Inactive as a mydriatic
- (c) 3-5 times less active as a mydriatic than (+)-hyoscyamine
- (d) 100 times more active as a mydriatic (+)-hyoscyamine

25.







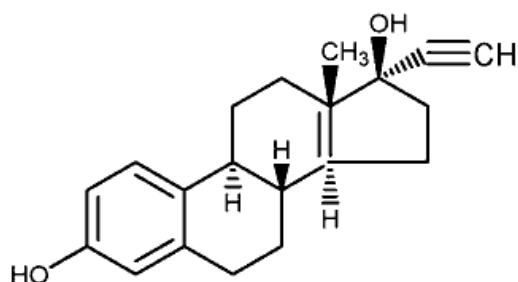
33. A prescription requires 4 mEq/liter of hydrogen phosphate ion  $\text{HPO}_4^{-2}$ . How many milligrams of dibasic potassium phosphate,  $\text{K}_2\text{HPO}_4$  (molecular weight 174) will be required ?
- (a) 174 mg/liter (b) 130.5 mg/liter  
(c) 522 mg/liter (d) 348 mg/liter
34. Gram positive bacterial typically contain
- (a) Cell wall that lack peptidoglycans  
(b) Repeating units arabinogalactan and mycolates in their cellwalls  
(c) Peptidoglycan muramic acid and D-amino acids in their cell walls  
(d) Cell walls containing predominantly polysaccharides and glycoproteins
35. Quaternary structure of a protein molecule refers to
- (a) Specific association to two or more copies of a polypeptide chain to result in a biologically active molecule  
(b) Regular seen local structure within a polypeptide chain  
(c) The portion of the polypeptide chain that comes into contact with another protein molecule  
(d) The portion of the structure that gets stabilized upon binding to nucleic acid
36. A blood sample is treated with alkaline phosphotungstic acid to form tungsten blue, which is estimated colorimetrically to give a positive reaction. The sample contains
- (a) Protein (b) Serum creatinine  
(c) Serum phenylalanine (d) Uric acid
37. Two important steps for plant regeneration by organogenesis are
- (P) Establishment of callus cultures (Q) Initiation of somatic embryogenesis  
(R) Germination of seeds (S) Initiation of cell suspensions
- (a) Q, S (b) P, R (c) P, S (d) Q, R
38. Two tests for ephedrine are
- (P) A solution in dilute HCl, treated with copper sulphate and sodium hydroxide gives a violet colour  
(Q) An alcoholic solution gives a red colour with  $\text{FeCl}_3$   
(R) On shaking with solvent ether, the organic layer shows purple while the aqueous layer becomes blue  
(S) A solution of vanillin gives a violet-red colour
- (a) Q, S (b) P, S (c) P, R (d) Q, R
39. Dried fruits of sweet fennel has two the following properties
- (P) 80 % of E-anethole, 10 % of methyl chavicol and 5% (+)-fenchone as constituents  
(Q) 65-75 % (+) Linalool as a constituent  
(R) The fruit is a dianthene, almost cylinder and surrounded by large stylopod  
(S) The fruit is elongated and surrounded by cayculus
- (a) P, R (b) Q, S (c) P, S (d) Q, R

40. Dihydroxy acetone phosphate is involved in the biosyntheses of two of the following
- |               |                     |          |          |
|---------------|---------------------|----------|----------|
| (P) Serotonin | (Q) Triacylglycerol |          |          |
| (R) Pyruvate  | (S) Methionine      |          |          |
| (a) P, Q      | (b) P, R            | (c) Q, S | (d) Q, R |

41. The virus responsible for SARS can be described by two of the following features
- (P) It contains double-stranded DNA and requires two complementary strands to be synthesized to serve as mRNA
- (Q) It has distinctive club shaped particles projecting from the surface, appearing like a crown
- (R) It contains plus-strand RNA that can serve directly as mRNA
- (S) It is a retrovirus and requires extracellular DNA for replication
- |          |          |          |          |
|----------|----------|----------|----------|
| (a) P, Q | (b) P, S | (c) Q, R | (d) R, S |
|----------|----------|----------|----------|

42. Two of the following facts are associated with Ethylene oxide gas
- (P) It is non toxic and non inflammable and used for sterilization
- (Q) It is a colourless inflammable gas. Toxic in nature and used for sterilization
- (R) It is diluted with CO<sub>2</sub>
- (S) It cannot penetrate plastic and paper packaging
- |          |          |          |          |
|----------|----------|----------|----------|
| (a) P, R | (b) P, S | (c) R, S | (d) Q, R |
|----------|----------|----------|----------|

43.



- (P) Is active parenterally
- (Q) Shows greater activity orally than parenterally
- (R) Is orally inactive
- (S) Has no parenteral activity
- |          |          |          |          |
|----------|----------|----------|----------|
| (a) P, S | (b) Q, R | (c) R, S | (d) P, S |
|----------|----------|----------|----------|

44. Tranexamic acid is

- (P) Trans-4-amino methyl cyclohexane carboxylic acid
- (Q) A polypeptide
- (R) An inhibitor of proteolytic enzymes including plasmin
- (S) Used for the prophylaxis of hemorrhage associated with excessive fibrinolysis
- |          |          |          |          |
|----------|----------|----------|----------|
| (a) P, S | (b) P, R | (c) Q, R | (d) R, S |
|----------|----------|----------|----------|

45. Prostaglandins are derivatives of

- (P) C<sub>25</sub> acid
- (Q) 7-(2 cyclohexyl) pentenoic acid
- (R) C<sub>20</sub> prostanoid acid
- (S) 7-(2 octyl cyclopentyl) heptanoic acid
- |          |          |          |          |
|----------|----------|----------|----------|
| (a) P, Q | (b) R, S | (c) P, R | (d) Q, S |
|----------|----------|----------|----------|

46. Two ex-officio members of the Drugs Technical Advisory Board under Drugs and Cosmetic Act are  
 (P) The Drugs Controller Genral of India  
 (Q) The President, Medical Council of India  
 (R) The Secretary, Pharmacy Council of India  
 (S) The Director, National Institute of Pharmaceutical Education and Research, India  
 (a) P, Q (b) P, R (c) R, S (d) P, S
47. Calfactant is  
 (P) A sterile non-pyrogenic lung surfactant intended for intratracheal instillation to premature infants  
 (Q) A synthetic surfactant popularly used to prepare total parenteral nutrition to premature infants  
 (R) A potent chelating agent used to prevent metal induced oxidation process  
 (S) An extract of natural surfactant from calf lungs  
 (a) P, Q (b) R, S (c) P, S (d) Q, R
48. In cross-over bioavailability studies, in which the subjects must be rested for sufficient time between each drug administration to ensure that 'washout' is complete. Practically, wash-out is deemed complete, when  
 (P) 95% is wash out (Q) 100% is wash out  
 (R) 5 biological half-lives have elapsed (S) 2 biological half-lives have elapsed  
 (a) P, R (b) P, S (c) Q, R (d) Q, S
49. Two reference electrodes are  
 (P) Glass membrane electrodes (Q) Sb/Sb<sub>2</sub>O<sub>3</sub> electrodes  
 (R) Calomel electrodes (S) Silver/silver-chloride electrodes  
 (a) P, Q (b) Q, S (c) R, S (d) P, R
50. Polarography can be used for the  
 (P) Simultaneous determination of several analytes  
 (Q) Study of resistance of solution  
 (R) Study of current potential relationship  
 (S) Study of optical activity of organic compounds  
 (a) P, S (b) Q, S (c) P, R (d) P, Q
51. Primary amines show  
 (P) Two N-H stretching bands in the range of 3500-3300 cm<sup>-1</sup>  
 (Q) Only one band in the region 3500-3300 cm<sup>-1</sup>  
 (R) -NH band in primary amine results in a broad band in the region 1640-1560 cm<sup>-1</sup>  
 (S) The typical -NH<sub>2</sub> stretching value at 1715 cm<sup>-1</sup>  
 (a) Q, R (b) P, R (c) P, S (d) Q, S
52. The drug Disulfiram is  
 (P) Known to inhibit dopamine β -hydroxylase and cause noradrenaline depletion  
 (Q) A substance that produce aversive reaction to alcohol  
 (R) Known to stimulate dopamine β-hydroxylase  
 (S) Used in barbiturate poisoning  
 (a) P, S (b) Q, R (c) R, S (d) P, Q

53. Two important attributes associated with L-asparaginase

(P) An enzyme obtained from *E. coli* and is administered parenterally

(Q) An enzyme obtained from *Streptococcus caespitosus* and is administered orally

(R) Used in acute lymphocytic leukemia

(S) Used as a fibrinolytic agent

(a) P, S

(b) P, R

(c) Q, R

(d) Q, S

54. Amikacin is

(P) A semisynthetic aminoglycoside and a derivative of kanamycin

(Q) A semisynthetic aminoglycoside and a derivative of tobramycin

(R) It is administered parenterally and does not cause nephrotoxicity and ototoxicity

(S) It is administered parenterally and is both nephrotoxicity and ototoxicity

(a) P, Q

(b) P, R

(c) P, S

(d) Q, S

**Q.55-70 Are Matching Exercise Match Group I with Group II and identify the correct combinations**

55. Group I

Plant

(P) Thorn apple

(Q) Henbane

(R) Deadly nightshade

(S) Foxglove leaves

(a) P-2, Q-1, R-4, S-3

(c) P-3, Q-4, R-2, S-1

Group II

Source

(1) Dried leaves and flowering tops of *Hyoscyamus niger*

(2) Dried leaves and flowering tops of *Datura atramonium*

(3) Leaves of *Delphinium purpureum* dried at a Temperature below 60°C

(4) Dried leaves and other aerial parts of *Atropa belladonna* or *Atropa acuminata*

(b) P-1, Q-2, R-3, S-4

(d) P-2, Q-3, R-4, S-1

56. Group I

Drugs

(P) Kaolin

(Q) Keiselguhr

(R) Calamine

(S) Tak

(a) P-1, Q-4, R-3, S-2

(c) P-2, Q-1, R-4, S-3

Group II

Source

(1) Natural diatomaceous earth consisting of siliceous skeletons of fossils

(2) Purified native hydrated aluminium silicate

(3) Hydrated magnesium silicate

(4) An ore contains zinc oxide with a small amount of ferric oxide

(b) P-2, Q-4, R-1, S-3

(d) P-3, Q-2, R-1, S-4

57. Proof for the following in the natural products is obtained by some reactions.

**Group I**

Natural Products

- (P) Cholesterol-nature of ring
- (Q) Ephedrine-secondary amino group
  
- (R) Morphine-secondary -OH group
  
- (S) Caffeine-nature of ring

(a) P-3, Q-1, R-2, S-4

(c) P-3, Q-4, R-1, S-4

**Group II**

Reactions

- (1) Treatment with  $\text{HNO}_2$  forms a nitroso compound
- (2) Selenium dehydrogenation gives Diel's hydrocarbon
- (3) With  $\text{CH}_3\text{I}$  in aqueous  $\text{KHO}$  gives (-) codeine, which is not soluble in alkali; codeine can be oxidized with chromic acid to codeinone
- (4) Oxidation with potassium chlorate in hydrochloric acid gives diamethyl alloxan and methyl urea

(b) P-2, Q-1, R-3, S-4

(d) P-4, Q-2, R-1, S-3

58. Derivatives of cortisol and their structural modification are

**Group I**

Derivative

- (P) Prednisolone
- (Q) Dexamethasone
- (R) Betamethasone
- (S) Triamcinolone

(a) P-2, Q-1, R-3, S-4

(c) P-2, Q-4, R-3, S-1

**Group II**

Structural modification

- (1) 1, 2-dehydro,  $9\alpha$ -fluoro,  $16\alpha$ -methyl
- (2) 1, 2-dehydro
- (3) 1, 2-dehydro,  $9\alpha$ -fluoro,  $16\beta$ -methyl
- (4) 1, 2-dehydro,  $9\alpha$ -fluoro,  $16\alpha$ -hydroxy

(b) P-1, Q-3, R-4, S-2

(d) P-3, Q-2, R-1, S-4

59. **Group I**

Drugs

- (P) Clofazimine
- (Q) Ketoconazole
- (R) Melphalan
- (S) Dapsone

(a) P-1, Q-2, R-3, S-4

(c) P-3, Q-4, R-2, S-1

**Group II**

Starting material for synthesis

- (1) p-chloronitro benzene
- (2) L-phenyl alanine
- (3) -N-(4-chlorophenyl)-O-phenylenediamine
- (4) 2,4-dichloro phenylbromide and glycerine

(b) P-4, Q-3, R-1, S-2

(d) P-2, Q-1, R-4, S-3

60. **Group I**

Industrial dryers

- (P) Drum dryer
- (Q) Fluidized bed dryer
- (R) Spray dryer
- (S) Freeze dryer

(a) P-1, Q-3, R-4, S-2

(c) P-4, Q-2, R-1, S-3

**Group II**

Pharmaceutical material dried

- (1) Antibiotic solution
- (2) Tablet granules
- (3) Gelatin
- (4) Suspension of kaolin

(b) P-4, Q-2, R-3, S-1

(d) P-3, Q-2, R-4, S-1



61. **Group I**

Name of equation

(P) Noyes & Whitney equation

(Q) B.E.T equation

(R) Stokes equation

(S) Higuchi equation

(a) P-4, Q-2, R-3, S-1

(c) P-3, Q-1, R-2, S-4

62. **Group I**

Types of coating

(P) Seal coating

(Q) Sub coating

(R) Polishing

(S) Film coating

(a) P-4, Q-3, R-2, S-1

(c) P-3, Q-1, R-2, S-4

63. **Group I**

Interacting drugs

(P) Verapamil and Atenolol

(Q) Clozapine and Co-trimoxazole

(R) Alcohol and Flunitrazepam

(S) Ramipril and amiloride

(a) P-4, Q-2, R-3, S-1

(c) P-3, Q-4, R-2, S-1

64. **Group I**

Receptors

(P)  $\beta$ -adrenergic (Type 2)

(Q)  $\alpha$ -adrenergic (Type 1)

(R) Dopaminergic (Type 2)

(S) 5-hydroxytryptamine (Type 1A)

(a) P-1, Q-4, R-3, S-2

(c) P-2, Q-3, R-4, S-1

**Group II**

Equation

$$(1) \frac{dM}{dt} = \frac{DS}{h}(C_s - C)$$

$$(2) \frac{P}{Y(P_0 - P)} = \frac{1}{Y_m b} + \frac{b-1}{y_m b} \frac{P}{P_0}$$

$$(3) v = \frac{d^2(P_s - P_0)g}{18\eta_0}$$

$$(4) Q = \sqrt{\frac{DC_s t}{2A - C_s}} \cdot (2A - C_s)$$

(b) P-2, Q-4, R-1, S-3

(d) P-1, Q-2, R-3, S-4

**Group II**

Coating material

(1) HPMC

(2) Carnauba wax

(3) Gelatin

(4) PEG4000

(b) P-3, Q-1, R-2, S-4

(d) P-1, Q-2, R-3, S-4

**Group II**

Pharmacological effect

(1) Increased risk of hyperkalemia

(2) Bradycardia and asystole

(3) Increased risk of bone marrow suppression

(4) Severe CNS depression

(b) P-2, Q-3, R-4, S-1

(d) P-4, Q-1, R-2, S-3

**Group II**

Agonists

(1) Phenylephrine

(2) Bromocriptine

(3) Ritodrine

(4) Buspirone

(b) P-3, Q-2, R-4, S-1

(d) P-3, Q-1, R-2, S-4



65. **Group I**

Drugs

- (P) Terbinafine
- (Q) Cidofovir
- (R) Imatinib
- (S) Stavudine
- (a) P-1, Q-2, R-3, S-4
- (c) P-2, Q-3, R-4, S-1

66. **Group I**

Materials used

- (P) Sodium chloride
- (Q) Glass
- (R) Quartz
- (S) Potassium hydrogen phthalate
- (a) P-1, Q-2, R-3, S-4
- (c) P-3, Q-4, R-1, S-2

67. **Group I**

Drugs

- (P) Iopanoic acid
  
- (Q) Cyclizine hydrochloride
  
- (R) Chlorothiazide
  
- (S) Chlorambucil
- (a) P-1, Q-2, R-3, S-4
- (c) P-4, Q-3, R-1, S-2

68. **Group I**

Techniques

- (P) Potentiometry
- (Q) Polarography
- (R) Colorimetry
- (S) Column chromatography
- (a) P-1, Q-4, R-3, S-2
- (c) P-2, Q-3, R-4, S-1

**Group II**

Mechanisms

- (1) Inhibition of reverse transcriptase
- (2) Selective inhibition of squalene epoxidase
- (3) Inhibition of DNA polymerase
- (4) Tyrosine kinase inhibitor
- (b) P-4, Q-3, R-2, S-1
- (d) P-3, Q-2, R-1, S-4

**Group II**

Instrumental techniques

- (1) Colorimetry
- (2) UV spectrophotometry
- (3) X-ray diffraction
- (4) IR spectrophotometry
- (b) P-4, Q-1, R-2, S-3
- (d) P-2, Q-3, R-4, S-1

**Group II**

B.P Assay

- (1) Titration of a solution in anhydrous formic acid and acetic anhydride with 0.1N perchloric acid
- (2) Titration of a solution in dimethylformamide with 0.1M tetrabutyl ammonium hydroxide
- (3) Treating with sodium hydroxide and zinc powder and then titration with 0.1N silver nitrate
- (4) Titration with 0.1N sodium hydroxide using phenolphthalein indicator
- (b) P-2, Q-4, R-1, S-3
- (d) P-3, Q-1, R-2, S-4

**Group II**

Related equations

- (1)  $id=708 n CD^{1/2} m^{2/3} t^{1/6}$
- (2)  $VR=tR Fc$
- (3)  $E = E^0 - \frac{RT}{nF} \log[H^+]$
- (4)  $A=ebc$
- (b) P-3, Q-2, R-1, S-4
- (d) P-2, Q-3, R-4, S-1

69. **Group I**

Test

(P) Direct agglutination test

(Q) Passive agglutination

(R) Haemagglutination inhibition test

(S) Coomb's test

(a) P-2, Q-4, R-1, S-3

(c) P-1, Q-3, R-2, S-4

70. **Group I**

Enzymes

(P) Na<sup>+</sup>-K<sup>+</sup> ATPase

(Q) Cytochrome c oxidase

(R) Malate dehydrogenase

(S) Tyrosine kinase

(a) P-3, Q-1, R-2, S-4

(c) P-2, Q-4, R-1, S-3

**Group II**

Principle

(1) Measures antibody titres after soluble antigens are attached to inert particles and incubated with antibodies.

(2) Detects blocking-type antibodies, globulins and complement that are attached to red cell antigens.

(3) RBCs coated with homologous antigens added to antibodies incubated with soluble antigens

(4) RBC antigen incubated with antibodies and antibody titre visually examined

(b) P-4, Q-1, R-3, S-2

(d) P-3, Q-2, R-4, S-1

**Group II**

Function

(1) Electron transport

(2) Pathway converting pyruvate to oxaloacetate

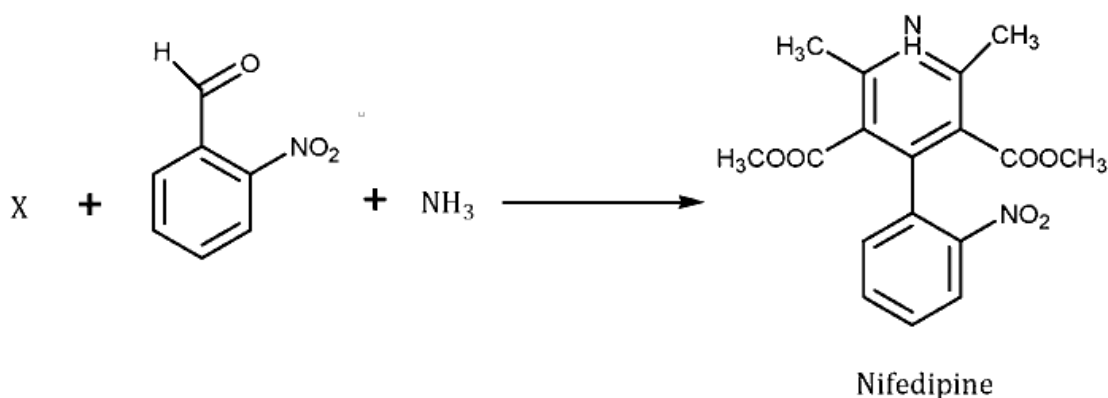
(3) Generation of electrochemical potential gradient across membranes

(4) Signal transduction

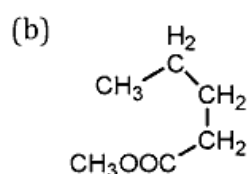
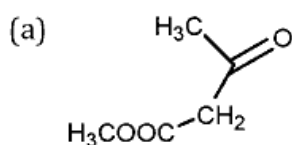
(b) P-1, Q-3, R-4, S-2

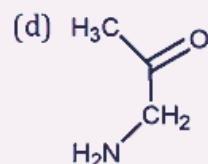
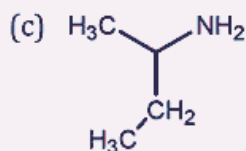
(d) P-4, Q-2, R-3, S-1

**Common Data Question 71,72,73**



71. Reagent X is





72. Nifedipine when exposed to day light is readily converted into derivative of

- (a) 4-phenyl pyridine  
(b) Nitrosophenyl pyridine  
(c) Diazophenyl pyridine  
(d) Nitrobenzene

73. The B.P. assay of Nifedipine is by a titration of a

- (a) Solution in anhydrous acetic acid with 0.1 perchloric acid  
(b) Solution in previously neutralized acetone with 0.1N sodium hydroxide; end point by potentiometry  
(c) Solution in previously neutralized acetone against standard potassium dichromate solution  
(d) A solution in 2-methyl 2-propanol and perchloric acid with 0.1 M cerium sulphate using ferroin as indicator <http://www.xamstudy.com>

### COMMON DATA FOR QUESTION 74 AND 75

Tenoposide is a natural product used for the management of certain diseases

74. It is derived from

- (a) Flavonolignans from *Silybum marianum*  
(b) Lignans from *Podophyllum peltatum*  
(c) Lignans from *Schizandra chinensis*  
(d) Neolignans from *Piper futokadsura*

75. This drug is used in the management of

- (a) Candidiasis  
(b) Trypanosomiasis  
(c) Cardiac arrhythmia  
(d) Acute leukemia in children

Linked Answer Question: Q.76 to Q.85 carry two marks each.

Statement for Linked Answers Question 76.& 77.

Extract of chondrodendron tomentosum, family manispermaceae contains several alkaloids

76. One of the important alkaloid is

- (a) (-) Phyllandrene  
(b) (+) Hollarhenine  
(c) (+) Tubocurarine  
(d) (±) Colchicine

77. This alkaloid has

- (a) Bis benzyl tetrahydro isoquinoline ring  
(b) Quinoline ring  
(c) Phenanthrene ring  
(d) Pyrido pyrimidine ring

Statement for Linked Answers Question 78.&79.

Several drugs are used for migraine

78. Acute migraine is treated with

- (a) Prazosin  
(b) Formeterol  
(c) Sumatriptan  
(d) Dopamine

79. The drug chosen is the agonist of

- (a)  $\alpha_1$  adrenocipitoe      (b)  $\alpha_2$  adrenoceptor      (c)  $M_2$  receptor      (d)  $5-HT_{1D}$  receptor

**Statement for Linked Answer Question 80 & 81**

A drug which is used for malignant melanoma is obtained as follows:



80. X is

- (a)
- (b)
- (c)
- (d)

81. X on treatment with dimethylamine gives the drug

- (a)
- (b)
- (c)
- (d)

**Statement for Linked Answer Question 82.& 83.**

A 250 mg dose of a drug was administered to a patient by rapid IV injections. The initial plasma concentration was  $2.50 \mu\text{g/mL}$ . After 4 hours the plasma concentration was  $1.89 \mu\text{g/mL}$ . Assuming that the drug was eliminated by a pseudo first order process and the body behaves as one compartment model.

82.  $K_{el}$  is

- (a)  $0.0699h^{-1}$  (b)  $0.0349h^{-1}$  (c)  $1.623h^{-1}$  (d)  $0.699h^{-1}$

83. Biological half life is

- (a) 4.95 hours (b) 19.82 hours (c) 99.1 hours (d) 9.91 hours

**Statement for Linked Answers Question 84.&85.**

As per the Woodward-Fieser rule, the absorption maxima of the compound shown is calculated from the base value and the ring residue values

84. Base value is

- (a) 215nm (b) 233nm (c) 240nm (d) 217nm

85. Absorption maxima is

- (a) 273nm (b) 258nm (c) 265nm (d) 237nm

**End of paper**

**ANSWER KEY GATE 2008**

1-b	2-b	3-d	4-d	5-a	6-d
7-b	8-b	9-d	10-b	11-a	12-d
13-b	14-a	15-b	16-b	17-b	18-d
19-d	20-b	21-b	22-d	23-b	24-d
25-a	26-b	27-c	28-d	29-d	30-a
31-a	32-a	33-d	34-c	35-a	36-b
37-c	38-c	39-a	40-d	41-c	42-d
43-a	44-a	45-b	46-a	47-c	48-a
49-d	50-c	51-b	52-d	53-b	54-c
55-a	56-c	57-b	58-b	59-c	60-c
61-d	62-a	63-b	64-d	65-c	66-b
67-b	68-d	69-b	70-a	71-a	72-b
73-d	74-b	75-d	76-c	77-a	78-c
79-d	80-a	81-b	82-a	83-d	84-b
85-a					

# GPAT QUESTION PAPER 2007 WITH ANSWER KEY

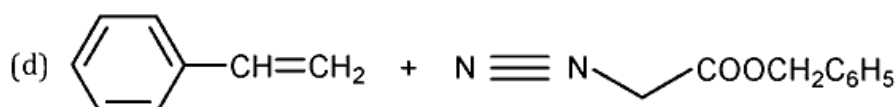
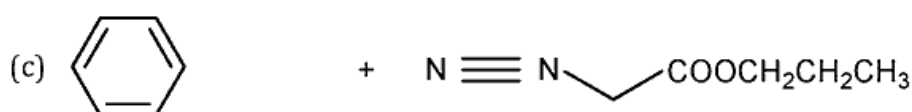
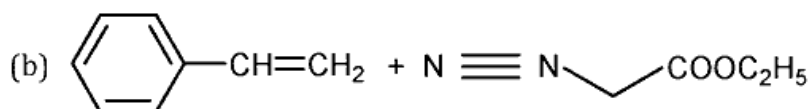
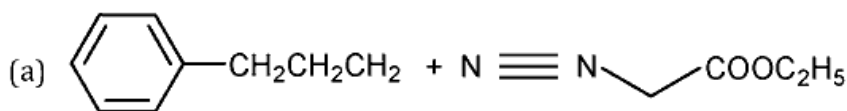
## PHARMACEUTICAL SCIENCE

Time : 3 hours

Maximum Marks : 150

### (Q. 1 - 20) CARRY ONE MARK EACH

- The characteristic odour of onion bulbs is attributed to
  - Quercetin glycosides
  - Furostanol glycosides
  - Heterogeneous sulphated polysaccharides
  - Alkyl or alkenyl disulphides
- The chief constituent of the seeds *strophanthus gratus* or woods of *Acokantheraschimiperi* belonging to the family Apocynaceae is G-strophanthin. On hydrolysis, it gives
  - Scallarenin
  - Ouabagenin
  - Cannogenin
  - Diosgenin
- The duration of action of sublingual nitroglycerin tablet is
  - 8-10 hours
  - 4-8 hours
  - 10-30 minutes
  - 3-5 minutes
- Identify the adrenergic receptor, whose agonists can be misused by sportsmen for anabolic effects.
  - $\alpha_1$
  - $\alpha_2$
  - $\beta_1$
  - $\beta_2$
- When the urinary pH becomes 8.0, significant increase in the excretion of the drugs takes place
  - Mepyramine
  - Aspirin
  - Morphine
  - Mecamylamine
- Condensation of 6-hydroxy-2,4,5-triaminopyridine with 1,1,3-trichloro acetone and N-(4-aminobenzoyl) glutamic acid at pH 4 to 5, in the presence of sodium bisulphate gives
  - Pteroyl glutamic acid
  - Amethopterin
  - Triamterene
  - Aciclovir
- The common structural feature of iodoxamic acid, iotalamic acid, diatrizoic acid and Iocarmic acid is
  - Sulphonaphthalein
  - 2,4,6-tri-iodo benzoic acid
  - Tri-iodo triphenyl methanoic acid
  - Tri-iodo diphenyl methanoic acid
- Tranylcypromine, a psychonaleptic and antidepressant drug is synthesized from





9. List of diseases and ailments which a drug may not purport to prevent or cure or make claims to prevent or cure under the Drugs and Cosmetics Rule 1945 is given under
- (a) Schedule J                      (b) Schedule K                      (c) Schedule M                      (d) Schedule P
10. Annatto consists of the dried seeds of *Bixa orellana* .L. Family Bixaceae. The chief constituent is
- (a) Triterpene alcohol                      (b) Crocin and crocetin  
(c) Capsanthin                      (d) Carotenoids
11. 'Cresol with soap solution' is a preparation, in which soap is incorporated to
- (a) Impart detergent property  
(b) Improve mutual miscibility of cresol and water by reducing critical solution temperature of Cresol water system  
(c) Sustain the germicidal action of cresol  
(d) Improve the stability of cresol
12. When stoichiometric amount of  $\text{CaCl}_2$  is added to an emulsion stabilized with sodium alginate, it will
- (a) Crack immediately                      (b) Change the nature from w/o to o/w  
(c) Change the nature from o/w to w/o                      (d) Accelerate the phenomenon of Ostwald ripening
13. Chlorine and bromine substitution in aromatic compounds
- (a) Enhances fluorescence                      (b) Does not change the fluorescence  
(c) Quenches the fluorescence                      (d) Removes the fluorescence
14. Solvent programming, also called gradient elution, involves
- (a) Changing the column length                      (b) Changing the mobile phase composition  
(c) Using the mobile phase is unchanged                      (d) Successive injection of sample
15. Calibration of the cell constant of conductance cell is carried out by using a solution
- (a) 0.1 M NaCl                      (b) 0.1 M  $\text{CaCl}_2$   
(c) 0.1 M KCl                      (d) 0.1 M  $\text{AlCl}_3$
16. Hybridoma technology is widely used for producing
- (a) Callus culture                      (b) Organ culture  
(c) Monoclonal antibodies                      (d) Attenuated microorganism
17. 'Gene therapy' refers to the process of
- (a) Identifying disease causing genes and activating them for therapeutic benefits  
(b) Increasing the expression levels of the set of genes involved in a given disease in affected cells through selective modulating agents  
(c) Transfer of new genetic material to the cells of an individual for therapeutic benefit  
(d) Removal of the protein corresponding to the disease causing genes from the cells of the affected individual
18. A technician is attempting to sterilize a plug of cotton in hermetically sealed condition in a glass bottle by autoclaving. Which of the following statement is correct
- (a) It should be sterilized at 115-118° C for 30 minutes  
(b) It should be sterilized at 121 to 124° C for 15 minutes at 15 lbs/sq. inch pressure

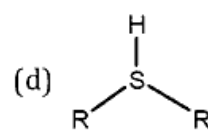
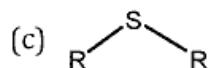
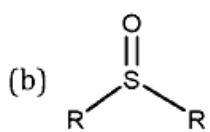
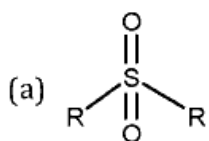
- (c) Sterilization cannot be achieved
- (d) It should be autoclaved at 126-129° C with saturated steam for 10 minutes

19. Hyperuricaemia is associated with the abnormal metabolism of
- (a) Pyrimidine
  - (b) Purine
  - (c) Riboflavin
  - (d) Thiamine
20. What is the concentration of NaCl required making 1% solution of cocaine HCl isotonic with blood plasma? Freezing point of 1% w/v solution of NaCl is -0.576°C and freezing point of 1% w/v cocaine HCl is - 0.09°C
- (a) 0.746 % w/v
  - (b) 0.9 % w/v
  - (c) 0.05% w/v
  - (d) 0.373% w/v

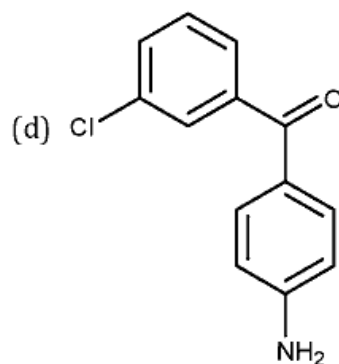
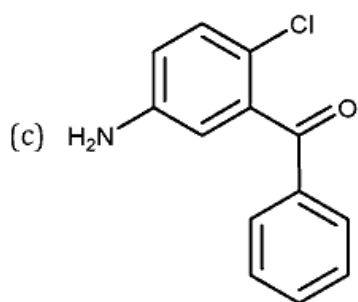
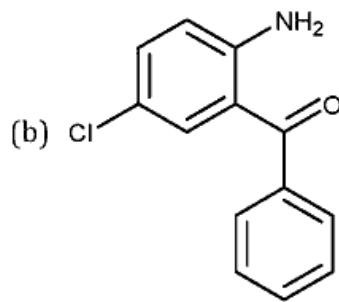
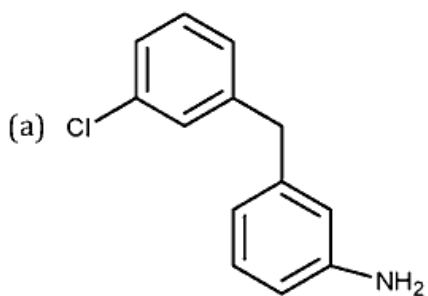
**Q.21 TO 75 CARRY TWO MARKS EACH**

21. Arillode is
- (a) Warty out-growth from micropyl, eg., castor
  - (b) Succulent growth from hilum covering the entire seed, eg., nutmeg
  - (c) Outgrowth originating from micropyle and covering the seeds, eg., cardamom
  - (d) Enlarged funicle, eg., coihicum seed
22. Cinnamon consists of the dried inner bark of the shoots of coppiced tree of *Cinnamomum zeylanicum* Nees. The typical microscopic characters of the bark are
- (a) Biseriate medullary rays, secretory cavities containing volatile oil and mucilage and few starch grains in cortical parenchyma and calcium oxalate in parenchymatous cells.
  - (b) 2-5 layers of cork cells containing oil globules. Presence of schizogenous canal
  - (c) Medullary rays multiseriate, the periderm portion cork has both tangentially and radially elongated cells, stone cells present and no phloem fibers
  - (d) Ex-foliated cork, non-lignified with 2-4 layers of phellogens. 15-20 rows of phelloderm. Prominent vascular tissue.
23. An essential ingredient in the general preparation of plant tissue culture media is
- (a) Auxin or naphthalene acetic acid
  - (b) Sucrose or glucose
  - (c) Giberlin G<sub>1</sub> or gibberellin G<sub>2</sub>
  - (d) Pyridoxine HCl.
24. The mefloquine, proguanil and primaquine can be effectively used in diseases produced by
- (a) Mycoplasma
  - (b) Dermatophytes
  - (c) Protozoa
  - (d) Spirochaetes
25. Identify the receptor which demonstrates the fastest onset of response, when stimulated
- (a) Nuclear receptors
  - (b) Ionotropic receptors
  - (c) G-protein coupled receptors
  - (d) Insulin receptor
26. One of the following drugs is converted to the corresponding deoxy nucleotide, which shows cytotoxicity
- (a) Dactinomycin
  - (b) Lomustine
  - (c) Vincristine
  - (d) 5-Fluorouracil
27. The compounds 2-Methyl-3-phytyl-1, 4-naphthoquinone and 2-methyl-1,3-all-trans faenesylgeranylgeranyl-1, 4-naphthoquinone are commonly known as:
- (a) Vitamin D<sub>2</sub> and D<sub>3</sub>
  - (b) Vitamin A<sub>1</sub> and A<sub>2</sub>
  - (c) Vitamin K<sub>1</sub> and K<sub>2</sub>
  - (d) Vitamin B<sub>1</sub> and B<sub>2</sub>

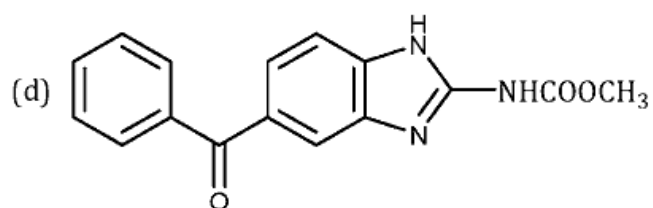
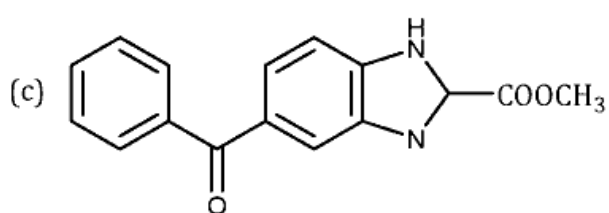
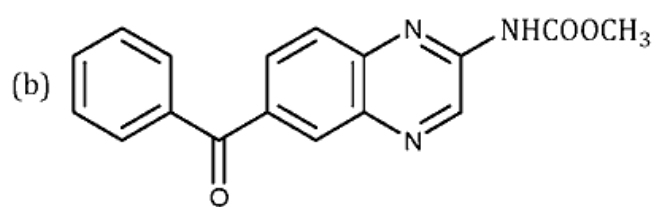
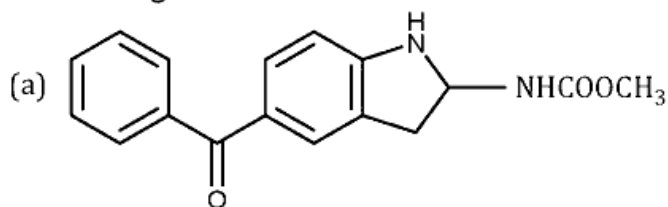
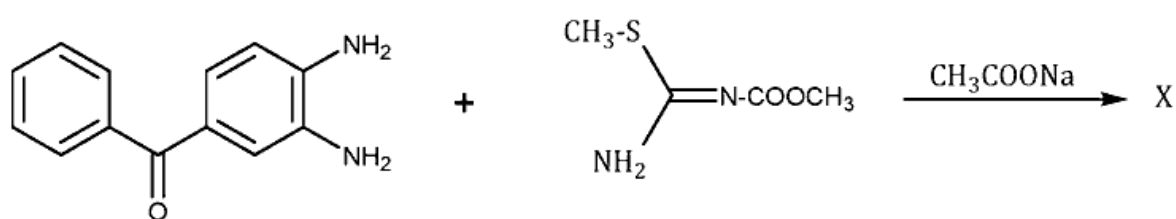
28. (Z)-5-Fluoro-2-methyl-1-[[p-(methyl-sulphinyl)phenyl]methylene]-1H indene-3-acetic acid, reaches peak blood levels within 2-4 hours and undergoes a complication reversible metabolism to become active. Active metabolite has the group.



29. An intermediate for the synthesis of benzodiazepine derivatives can be prepared by treating 4-chloroaniline with benzoyl chloride in the presence of zinc chloride as a catalyst. Identify the intermediate.



30. Find the product X in the reaction.



31. In the preparation of ointments, macrogels are used as used as
- (a) Water soluble base (b) Hydrocarbon base  
(c) Absorption base (d) Oleagenous base
32. An antioxidant commonly used in the formulation of a non-aqueous parenteral preparation is
- (a) Thioglycollic acid (b) Ascorbic acid  
(c) Sodium metabisulphite (d) Butylated hydroxyl toluene
33. Phosphatidic acid and its derivatives from liposomes because
- (a) In a fully hydrated condition, they are conical in shape  
(b) In a fully hydrated condition, they are cylindrical in shape  
(c) They contain only non-polar moieties in their structures  
(d) Their saponification values are unusually low.
34. With regard to the standards for sterile water for injection, IP, the 'residue on evaporation' limit is
- (a) Higher than water for injection, IP (b) Lower than water for injection, IP  
(c) Same as that of the water for injection, IP (d) No such standard is prescribed in the monograph
35. The number of peaks given by the  $^1\text{H}$  NMR spectrum of 2-methyl-1-pentene is
- (a) 4 (b) 5 (c) 6 (d) 3
36. In HPLC, the analytical performance improves when
- (a) Particle diameter is increased (b) Particle diameter is reduced  
(c) Coarser particle are paired with shorter columns (d) Low temperature is used
37. Increase in the extent of conjugation of a double bonded system results in
- (a) Hyperchromic shift (b) Hypochromic shift  
(c) Hypsochromic shift <http://www.xamstudy.com> (d) Bathochromic shift

**Q.38-54 are multipleselection items, P, Q, R, S are the options. Two of these option are correct. Combination among A, B, C and D.**

38. Alkaloids derived from ornithine are
- (P) Cocaine (Q) Colchicine (R) Hyosyamine (S) Emetine  
(a) Q, S (b) P, R (c) S, R (d) P, Q
39. *Aloe barbadensis* has two of following characters
- (P) The drug obtained is white in color and has a bitter taste  
(Q) The drug is opaque, yellowish brown to chocolate brown in color and breaks with a waxy fracture  
(R) The drug has a pungent odour and is amorphous under the microscope  
(S) Under in the microscope, acicular crystals are visible.
- (a) P, R (b) P, S (c) Q, S (d) Q, R
40. Tacrolimus is a macrolide antibiotic, which bears the following attributes
- (P) Produced from *streptomyces hygroscopicus* and is chemically related to cyclosporine  
(Q) Binds with cytoplasmic peptidyl-propyl-isomerase and can be useful in liver and kidney transplant  
(R) Produced from *streptomyces tsukubaensis* and is chemically, unrelated to cyclosporine

- (S) An inhibitor of pyrimidine synthesis, used in rheumatoid arthritis  
 (a) P, Q (b) P, S (c) Q, R (d) Q, S
41. Metformin acts by two mechanisms  
 (P) Increasing insulin secretion (Q) Inhibiting  $\alpha$ -glucosidase  
 (R) Decreasing hepatic glucose production (S) Increasing insulin action in muscle and fat  
 (a) P, Q (b) R, S (c) P, R (d) Q, S
42. Metabolic oxidation of carbon –nitrogen, carbon oxygen and carbon – sulphur systems principally  
 Involves two basic types of bio-transformation processes  
 (P) Hydroxylation of the  $\alpha$ -carbon atom attached directly to the heteroatom  
 (Q) Mixed function oxidase system also oxidizes carbon atom adjacent to carbonyl and imino functions  
 (R) Hydroxylation of the hetero-atom only  
 (S) Microsomal hydroxylation at allylic carbonatom  
 (a) P, R (b) P, S (c) Q, P (d) R, S
43. The silver salt sulphadiazine, SILVADENE, is an effective topical antimicrobial agent in burns because of  
 its two important attributes.  
 (P) Broad spectrum of activity  
 (Q) Active against pseudomonas spp.  
 (R) The salt is only very slightly soluble and it does not penetrate the wall, instead it acts on the structure  
 (S) The salt is highly soluble and hence it is rapidly absorbed  
 (a) P, Q (b) P, S (c) Q, R (d) R, S
44. In the synthesis of chlorpheniramine, two important ingredients required are  
 (P) 4-chloro benzyl cyanide (Q) 4-chloro pyridine  
 (R) 2-chloro benzyl cyanide (S) 2-chloro pyridine  
 (a) P, Q (b) P, S (c) Q, R (d) R, S
45. Zeta potential  
 (P) Is the difference in potential between the surface of the tightly bound layer and the electroneutral region  
 (Q) Is the potential at the solid surface of the suspended particle  
 (R) Can be positive, zero or negative  
 (S) Is the electrotherodynamic potential  
 (a) P, R (b) P, S (c) Q, R (d) P, Q
46. Two of the official standards for uncoated tablets as per IP are  
 (P) Shape (Q) Friability  
 (R) Disintegration time (S) Uniformity of weight  
 (a) P, Q (b) P, S (c) Q, R (d) R, S
47. As per schedule 'O' of the Drugs and Cosmetics Rules 1945, the minimum Ride-Walker coefficients  
 for Grade 1 and 3 Black disinfectant fluids are  
 (P) 18 (Q) 10 (R) 5 (S) 14  
 (a) P, R (b) Q, S (c) P, S (d) R, S



48. The IR spectrum of an organic liquid can be taken by placing it between a pair of polished plates made of  
 (P) NaCl (Q) FeSO<sub>4</sub> (R) KBr (S) AlCl<sub>3</sub>  
 (a) P, Q (b) P, S (c) R, S (d) P, R
49. In gas chromatography, derivatisation is desirable to  
 (P) Improve the thermal stability of compounds  
 (Q) Enable interaction with carrier gas  
 (R) Introduce a detector oriented tag into the molecular  
 (S) Remove contaminants  
 (a) P, Q (b) Q, R (c) P, R (d) P, S
50. Neutral thioaliphatic amino acid found in proteins are  
 (P) Methionine (Q) Valine (R) Cysteine (S) Leucine  
 (a) P, Q (b) P, R (c) P, S (d) R, S
51. Diazoxide, a benzothiazide derivative produces  
 (P) Vasoconstriction by activating ATP sensitive K<sup>+</sup> channel  
 (Q) Vasodilatation by activating ATP sensitive K<sup>+</sup> channel  
 (R) Inhibition of insulin secretion  
 (S) Stimulation of insulin secretion  
 (a) P, R (b) Q, R (c) P, S (d) Q, S
52. The principle of ELISA is based on these two observations  
 (P) Antibodies and antigens can attach to solid-phase supports and still maintain their full immunological capabilities  
 (Q) Antibodies complex with enzymes allowing full separation of antigen molecules  
 (R) Antigens and antibodies can be bonded to enzymes and resulting complexes are still fully functional both immunologically and enzymatically  
 (S) Enzymatic action is crucial for converting the antigens to render them suitable for binding to antibodies  
 (a) P, Q (b) P, R (c) Q, R (d) Q, S
53. Which of the following are likely to be good targets for designing antihypertensive drugs ?  
 (P) H<sub>2</sub> histamine receptor (Q) Proton pump  
 (R) Calcium channel protein (S) α<sub>2</sub>-adrenergic receptor  
 (a) P, Q (b) R, S (c) P, R (d) Q, S
54. The characteristic of the sabin vaccine administered orally for prevention of polio  
 (P) It consists of live attenuated strains of three immunological types of the poliovirus  
 (Q) It is generally not used in infants below 9 months of age  
 (R) It contains serum antibodies that are active against specific strains of poliovirus  
 (S) It has the risk of occasionally reverting back to virulent strains, resulting in vaccine-associated paralytic poliomyelitis  
 (a) P, S (b) Q, R (c) P, R (d) P, Q



## Q. 55-70 ARE MATCHING EXERCISES

### Match Group I with Group II and identify the correct combination

55. Mucilages are plant products formed at different parts of the plant

#### Group I

Plant part from which it is found

- (P) Cellwall of seed epidermis
- (Q) Endodermis
- (R) Epidermis of leaf
- (S) Special secretory cell

(a) P-4, Q-1, R-2, S-3

(c) P-3, Q-1, R-2, S-4

#### Group II

Example

- (1) Fenugreek
  - (2) Senna
  - (3) Squill
  - (4) Linseed
- (b) P-4, Q-2, R-1, S-3
- (d) P-1, Q-2, R-1, S-4

56. **Group I**

Crude Drugs

- (Q) Ergot
  - (P) Jaborandi
  - (R) Kurchi
  - (S) Pterocarpus
- (a) P-3, Q-2, R-4, S-1
- (c) P-3, Q-1, R-4, S-2

#### Group II

Chemical natural of their chief constituents

- (1) Imidazole alkaloids
  - (2) Steroidal compounds
  - (3) Indole alkaloids
  - (4) Condensed tannis
- (b) P-3, Q-1, R-2, S-4
- (d) P-3, Q-4, R-2, S-1

57. **Group I**

Common reagents used in pharmacognosy

- (P) 5% aqueous chlor-zinc-iodine
- (Q) Phloroglucinol and hydrochloric acid ethanol
- (R) A mixture of equal parts of ether and ethanol
- (S) A mixture of equal parts of chromic acid and nitric acid

(a) P-4, Q-2, R-3, S-1

(b) P-1, Q-3, R-2, S-4

(c) P-2, Q-1, R-4, S-3

(d) P-3, Q-4, R-1, S-2

#### Group II

Uses

- (1) Disintegration of sclerenchymatous tissues
- (2) Staining lignified wall pink or red
- (3) Removal of fixed oils and fats
- (4) Staining cellulose wall blue

58. **Group I**

Reactions

- (P) n-propyl-m-tolyl ketone is converted to m-(n-butyl) toluene using  $\text{NH}_2\text{-NH}_2$  and a base at  $200^\circ\text{C}$
- (Q) Phenol is treated with chloroform and aqueous sodium hydroxide by which, Salicylaldehyde is formed

#### Group II

Names

- (1) Perkin condensation
- (2) Wolff-Kishner reduction

- (R) Benzophenone and methylene triphenyle phospharane are treated and the product formed is 1,1 diphenyl ethane
- (S) Benzaldehyde is treated with acetic anhydride in the presence of sodium acetate, 3 phenyl- proprnoic acid is formed
- (a) P-2, Q-4, R-3, S-1  
(c) P-1, Q-3, R-4, S-2

59. **Group I**

Name of enzyme

- (P) Sutilains
- (Q) Urokinase
- (R) Alteplase
- (S) Bromelains

- (a) P-3, Q-4, R-2, S-1  
(c) P-4, Q-2, R-3, S-1

60. **Group I**

Physical form of substances

- (P) Castor oil
- (Q) Concentrated flocculated suspension
- (R) Liquide dispersion of methyl cellulose
- (S) Pastes of small deflocculated partical
- (a) P-4, Q-2, R-1, S-3  
(c) P-2, Q-3, R-4, S-1

61. **Group I**

- (P) Crystal growth
- (Q) pH scale
- (R) HLB scale
- (S) Interparticular force
- (a) P-4, Q-2, R-1, S-3  
(c) P-2, Q-4, R-3, S-1

- (3) Wittigs reaction
- (4) Reimer-Tiemann reaction
- (b) P-1, Q-3, R-4, S-1  
(d) P-4, Q-3, R-1, S-2

**Group II**

Description

- (1) Mixture of proteolytic enzyme obtained from the pine apple plant used for soft tissue inflammation and oedeam
- (2) It is a tissue plasminogen activator produced by recombinant DNA Technology
- (3) Obtained from tissue culture of human kidneys and is a glycosylated serine protease consisting of two polypetptide chains connected by a single disulphide bond
- (4) A proteolytic enzyme obtained from culture of bacillus subtilis used to dissolve necrotic tissue in bruns, bed sores and ulcerated wounds.
- (b) P-1, Q-3, R-4, S-2  
(d) P-4, Q-3, R-2, S-1

**Group II**

Rheological properties

- (1) Plastic flow
- (2) Pseudoplastic flow
- (3) Dilatant flow
- (4) Newtonian flow
- (b) P-3, Q-2, R-1, S-4  
(d) P-1, Q-4, R-3, S-2

**Group II**

- (1) Griffin
- (2) Sorensen
- (3) DLVO theory
- (4) Ostwald ripening
- (b) P-3, Q-1, R-2, S-4  
(d) P-1, Q-3, R-4, S-2

62. **Group I**

Method of purification

(P) Entrainment preventive distillation

(Q) Simple distillation

(R) Reverse osmosis

(S) Ion-exchange

(a) P-1, Q-4, R-3, S-2

(c) P-2, Q-3, R-4, S-1

63. **Group I**

Drugs

(P) Rifabutin

(Q) Penciclovir

(R) Imiquimod

(S) Amprenavir

(a) P-1, Q-2, R-4, S-3

(c) P-2, Q-1, R-4, S-3

64. **Group I**

Reponses/Incidents

(P) False transmitter

(Q) St. Antony's fire

(R) Triple response

(S) Straub phenomenon

(a) P-2, Q-4, R-1, S-3

(c) P-3, Q-2, R-1, S-4

65. **Group I**

Adverse effects

(P) Reye's syndrome

(Q) Hypertrichosis

(R) Grey baby syndrome

(S) Pinpoint pupil

(a) P-1, Q-2, R-4, S-3

(c) P-4, Q-1, R-2, S-3

**Group II**

Effect on water quality

(1) CFU value and endotoxin content usually increases

(2) Pyrogen free water

(3) Endotoxins and pyrogens are not removed

(4) Small organic molecules (molwt, approx. less than 200) are not removed

(b) P-4, Q-1, R-2, S-3

(d) P-3, Q-2, R-1, S-4

**Group II**

Mechanism

(1) Inhibition of viral DNA synthesis

(2) Inhibition of mycobacterial RNA polymerase

(3) Inhibition of HIV protease

(4) Immunomodulation

(b) P-3, Q-4, R-1, S-2

(d) P-4, Q-3, R-2, S-1

**Group II**

Bioactive substances

(1) Histamine

(2) Methyldopa

(3) Morphine

(4) Ergot alkaloid

(b) P-1, Q-4, R-3, S-2

(d) P-4, Q-3, R-2, S-1

**Group II**

Drugs

(1) Chloramphenicol

(2) Morphine

(3) Aspirin

(4) Minoxidil

(b) P-3, Q-4, R-1, S-2

(d) P-4, Q-3, R-2, S-1

66. **Group I**

Technique used

- (P) Polarography
- (Q) Potentionmetry
- (R) Conductometry
- (S) Amperometry
- (a) P-1, Q-4, R-3, S-2
- (c) P-3, Q-2, R-4, S-1

67. **Group I**

Type of Radiation

- (P) Radio frequency
- (Q) UV
- (R) X-ray
- (S) Mid-IR
- (a) P-1, Q-4, R-3, S-2
- (c) P-1, Q-2, R-3, S-4

68. **Group I**

Spraying reagents used in Chromatographic methods

- (P)  $\text{SbSI}_3$  in  $\text{CHCl}_3$
- (Q) Bromocresol green
- (R) Aniline phthalate
- (S) 2,4 dinitrophenyl hydrazine
- (a) P-2, Q-1, R-4, S-3
- (c) P-1, Q-3, R-2, S-4

69. **Group I**

Antibiotics

- (P) Erythromycin
- (Q) Doxycycline
- (R) Carbenicillin
- (S) Amphotericin B
- (a) P-4, Q-1, R-2, S-3
- (c) P-1, Q-2, R-3, S-4

70. **Group I**

Hormone

- (P) Vasopressin
- (Q) Oxytocin

**Group II**

Analytical method of evaluation

- (1) Potential-volume curve
- (2) Current-potential
- (3) Conductance-volume curve
- (4) Current-volume curve.
- (b) P-2, Q-1, R-3, S-4
- (d) P-4, Q-1, R-2, S-3

**Group II**

Wave length

- (1)  $> 100 \text{ nm}$
- (2) 200-380 nm
- (3) 10 pm- 10 nm
- (4) 2.5-50 $\mu\text{m}$
- (b) P-3, Q-2, R-1, S-4
- (d) P-2, Q-1, R-4, S-3

**Group II**

Type of substance

- (1) Carboxylic acid
- (2) Aldehyde or ketone
- (3) Steroid
- (4) Sugar
- (b) P-3, Q-1, R-4, S-2
- (d) P-4, Q-1, R-2, S-3

**Group II**

Test organism for microbiological assay IP

- (1) *Staphylococcus aureus*
- (2) *Pseudomonas aeruginosa*
- (3) *Saccharomyces cerevisiae*
- (4) *Micrococcus luteus*
- (b) P-3, Q-2, R-1, S-4
- (d) P-2, Q-4, R-3, S-2

**Group II**

Action

- (1) Modulates extensive vasodilatation
- (2) Helper hormone to corticotropic releasing hormone

- (R) Bradykinin (3) Stimulates synthesis of components of milk  
 (S) Prolactin (4) Responds to suckling reflex and estradiol  
 (a) P-2, Q-4, R-1, S-3 (b) P-1, Q-2, R-3, S-4  
 (c) P-4, Q-3, R-2, S-1 (d) P-3, Q-1, R-4, S-2

### Common data for questions 71-72

*Since ancient times, the coca leaves rich in cocaine, a psychostimulant, have been used by the South Americans as a masticatory agent.*

71. The alkaloid concentration in coca leaves vary from  
 (a) 3-4% (b) 0.7-1.5% (c) .01-0.02% (d) 9-11%
72. Cocaine, the alkaloid derived from coca leaves acts by  
 (a) Increasing noradrenaline synthesis (b) Inhibiting monoamine oxidase  
 (c) Inhibiting catechol-O-methyl transferase (d) Inhibiting noradrenaline re-uptake

### Common data for question 73-75

*Chlorambucil IP is a cytotoxic agent*

73. Chlorambucil is derivative of  
 (a) Amino phenyl butyric acid (b) Amino phenyl caproic acid  
 (c) Amino phenyl glycine (d) Diamino diphenyl
74. Identification test prescribed in IP is : 0.4g of the drug is extracted with 10ml quantities of 2M hydrochloric acid three times. To 10ML quantity of extracts, 0.5 ml potassium mercuric iodide solution is added, which yields.  
 (a) Yellow coloured precipitate (b) Yellow coloured solution  
 (c) Buff coloured precipitate (d) Red coloured precipitate
75. Chlorambucil is assayed as per IP by titrating a dilute acetone solution of the drug with  
 (a) 0.1 M sodium hydroxide (b) 0.1 M hydrochloric acid  
 (c) 0.2 M perchloric acid (d) 0.1 M silver nitrate

### Linked Answer Question: Q.76 to Q.85 carry two marks each.

**Statement for linked answer Question 76 and 77**

*Dried stigma of crocus sativus contains several constituents*

76. One of the important constituents is  
 (a) Picrocrocin (b) Picroside I (c) Picrasmin (d) Gymnemic acid
77. On hydrolysis, the gives a product which is responsible for the characteristics odour  
 (a) Crocetin (b) Saffranal (c) Quercetian (d) Crotonic acid

**Statement for Linked Answer Question 78 & 79**

*A glycosaminoglycan is found in the granules of mast cells.*

78. An anticoagulant glycosaminoglycan is  
(a) Warfarin (b) Heparin (c) Vitamin K (d) Aspirin

79. The anticoagulant selected above acts by  
(a) Lowering the affinity for free plasminogen (b) Degrading fibrin and fibrinogen  
(c) Binding to antithrombin III (d) Antagonizing co-factor function of vitamin K

**Statement for Linked Answer Question 80 & 81**

*Prazosin, an antihypertensive drug, is prepared as follows: 2, 4-dihydroxy -6, 7-dimethoxy quinazoline is treated with  $POCl_3/PCl_5$ , followed by amination. The product X is treated with a reagent Y to get Prazosin.*

81. The product X is  
(a) 4-Amino-3-chloro-6, 7-dimethoxy quinazoline  
(b) 2-Amino-4-chloro-6, 7-dimethoxy quinazoline  
(c) 4-Amino-2-chloro-6, 7-dimethoxy quinazoline  
(d) 4-Amino-6-chloro-2, 7-dimethoxy quinazoline

82. The reagent Y is  
(a) 1-(2-Furoyl)-pyridine (b) 1-(2-Furoyl)-piperazine  
(c) 1-(2-Pyridyl)-piperazine (d) 1-(2-Furoyl)-pyrimidine

**Statement for Linked Answer Questions 82 & 83**

*The powder of a viscosity builder is dispersed with high shear in 1/5 to 1/3 of the required amount of water preheated to 80° C to 90° C. Once the powder is finely dispersed, the volume is made up with ice cold water or ice. Moderate stirring causes prompt dissolution.* <http://www.xamstudy.com>

82. The powder is  
(a) Bentonite (b) Sodium carboxymethyl cellulose  
(c) Veegum (d) Methyl cellulose

83. For obtaining maximum clarity, hydration and viscosity the above solution should be cooled for about an hour to  
(a) 0°C to 10°C (b) 25°C (c) 50°C (d) 35°C

**Statement for Linked Answer Question 84 & 85**

$\epsilon$  and  $A_{1cm}^{1\%}$  can be interconverted using a formula, from which its molar absorptivity or absorbance can be calculated

84. The formula is  
(a)  $\epsilon$  and  $A_{1cm}^{1\%} \times \text{mol.wt} / 1000$  (b)  $\epsilon$  and  $A_{1cm}^{1\%} \times \text{mol.wt} / 10$   
(c)  $\epsilon$  and  $A_{1cm}^{1\%} \times \text{mol.wt} / 1000$  (d)  $\epsilon$  and  $A_{1cm}^{1\%} \times \text{mol.wt} / 100$

85. A compound has a molecular weight of 297; an equivalent weight of 148.5 and an  $A_{1cm}^{1\%}$  of 742 at 309 nm. Its molar absorptivity is  
(a) 220.37 (b) 1101.87 (c) 110.18 (d) 22037.5

**End of paper**



## ANSWER KEY GATE 2007

1-d	2-b	3-c	4-d	5-b	6-c
7-b	8-b	9-a	10-a	11-b	12-c
13-c	14-b	15-c	16-c	17-c	18-b
19-b	20-a	21-b	22-a	23-b	24-c
25-b	26-d	27-d	28-b	29-b	30-d
31-a	32-d	33-b	34-b	35-b	36-b
37-d	38-b	39-c	40-c	41-b	42-c
43-c	44-a	45-a	46-d	47-a	48-d
49-c	50-b	51-d	52-b	53-b	54-c
55-a	56-b	57-a	58-a	59-d	60-a
61-a	62-c	63-c	64-a	65-b	66-b
67-c	68-b	69-a	70-a	71-b	72-d
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79-c	80-c	81-b	82-d	83-c	84-b
85-d					

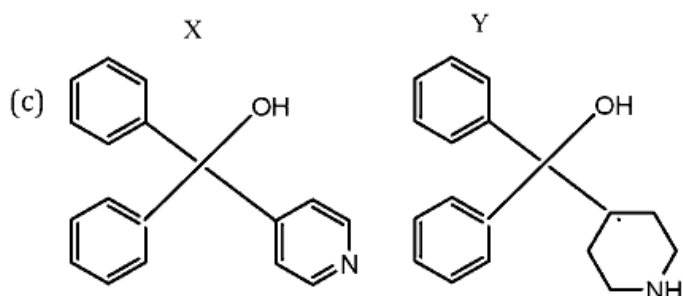
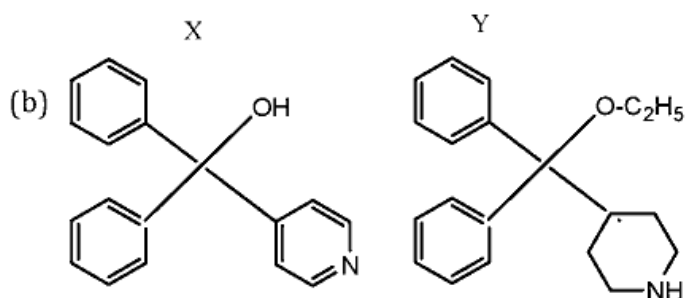
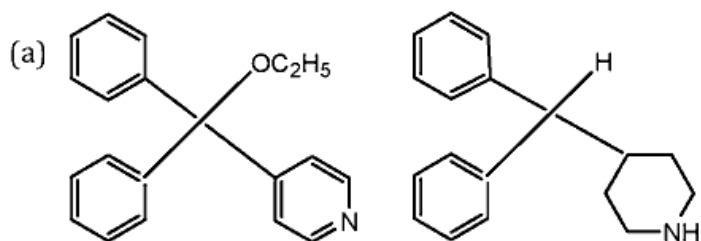
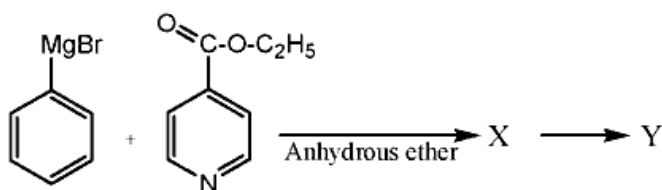


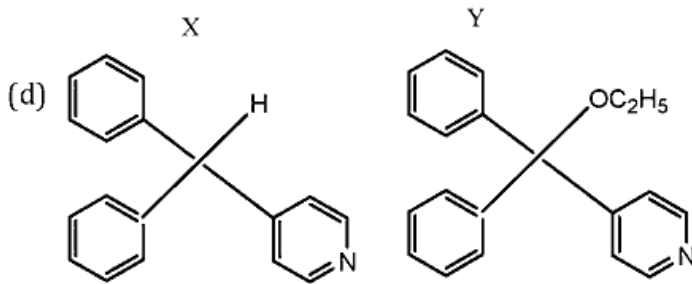
7. A monochromator is not used in
- (a) UV spectrophotometer (b) FT-IT spectrophotometer  
(c) Spectrofluorimeter (d) IR-spectrometer
8. The properties of solutions containing surface active agents change sharply over a narrow concentration range is called as
- (a) Critical micellar concentration (b) Ionic concentration  
(c) Hydrogen ion concentration (d) Surface tension
9. Certain suspensions with a high percentage of dispersed solids exhibit a resistance to flow with increasing rates of shear. Such systems actually increase in volume when sheared and are termed as:
- (a) Thixotropic (b) Dilatant (c) Plastic (d) Newtonian
10. In the process of sugar coating of tablets the colorants are added in one of the following steps:
- (a) Syrup coating (b) Polishing (c) Sub-coating (d) Seal coating
11. Metered dose inhalers documentation records shall show one of the information in addition to the GMP:
- (a) Portable stirrer  
(b) Records of rejection during on line check weighing  
(c) Water distillation unit deionizer  
(d) Electrically operate mixer
12. A drug which inhibits mycobacterial RNA polymerase and is very useful in treating *Mycobacterium avium* complex is:
- (a) Isoniazid (b) Ethionamine (c) Capreomycin (d) Rifabutin
13. A 80 years old lady suffering from osteoarthritis of hip and knee joints is given diclofenac 50 mg thrice daily and paracetamol 1 gm as require. She complains of passing black stools. This symptom is due to
- (a) Paracetamol causing the black stool  
(b) Change in food habits  
(c) Upper gastrointestinal bleeding due to diclofenac  
(d) Age related decrease in gastrointestinal motility
14. Terazosin, an antihypertensive drug acts by:
- (a) Blocking  $\beta$  adrenoreceptors (b) Blocking  $\alpha_1$  adrenoreceptors  
(c) Diuretic action (d) Inhibition of ACE
15. An imidazole aromatase inhibitor which is effective in reducing estrogen level is
- (a) Anastrozole (b) Exemestane  
(c) Mitotane (d) Dexamethasone
16. The main constituent in the dried ripe seeds of *Colchicum luteum* and *Colchicum autumnale* Linn. is derived from
- (a) Tyrosine, phenylalanine and dihydroxyphenylalanine  
(b) Tryptophan and tryptamine  
(c) Ornithine  
(d) Lysine

17. Formation of somatic embryos or embryogenic tissue directly from the explant without the formation of an intermediate callus phase is
- (a) Somatic embryogenic response (b) Callus formation  
(c) Direct somatic embryogenesis (d) Premature germination
18. While performing chemomicroscopy of a drug lignified trichomes were observe. Probable drug is
- (a) Buchu (b) Lobelia  
(c) Nuxvomica (d) Mint leaves
19. A common organism that causes meningitis belongs to the genus
- (a) Candida (b) Neisseria (c) Pseudomonas (d) Clostridium
20. Bradykinin is
- (a) A steroidal hormone (b) A serotonin derivative  
(c) Anonapeptide (d) A lipoprotein

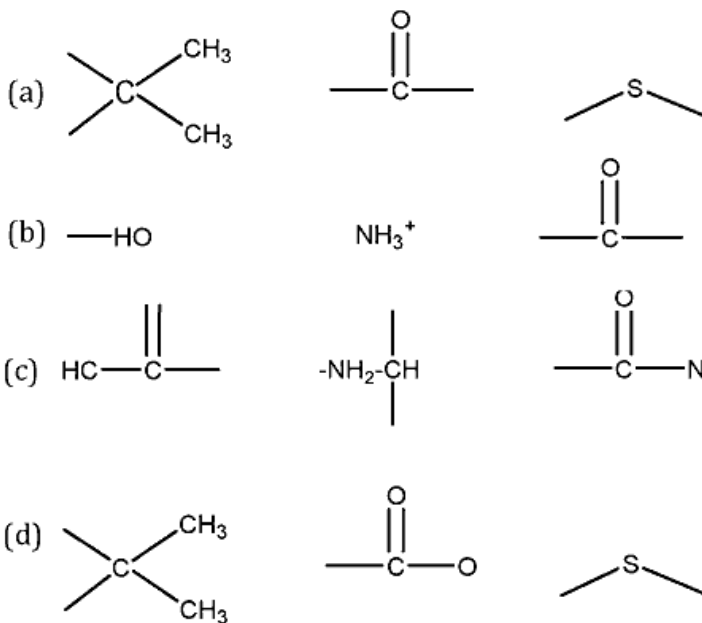
**(Q. 21 - 75) CARRY TWO MARK EACH**

21. Identify the correct combination of the intermediate X and the product Y.





22. Amoxicillin, a polyfunctional drug has different pKa values such as 9.6, 7.4 and 2.4, at physiological pH. Groups responsible respectively are



23. A drug which has potent peripheral vasodilatory properties inhibits the voltage dependent calcium channel in vascular smooth muscle is <http://www.xamstudy.com>

- (a) Diethyl 1,4-dihydro-2,6-dimethyl - 4 - (2-nitrophenyl)-3,5- Pyridine carboxylate  
 (b) Dimethyl 1,4-dihydro-2,6-diethyl - 4 - (2-nitrophenyl)-3,5- Pyridine carboxylate  
 (c) Dimethyl 1,4-dihydro-2,6-dimethyl - 4 - (2-nitrophenyl)-3,5- Pyrazine carboxylate  
 (d) Dimethyl 1,4-dihydro-2,6-dimethyl - 4 - (2-nitrophenyl)-3,5- Pyridine carboxylate

24. In the Bragg's equation  $n\lambda = 2d \sin\theta$ ,  $2\theta$  is the angle between

- (a) The direction between the incident beam and the refracted beam  
 (b) The surface of the crystal and the incident fluorescent beam  
 (c) The direction if the incident and that of the diffracted beam  
 (d) Two incident beams

25. The colour which the human eye perceives is not the colour corresponding to the wavelength of the light

- (a) Reflected (b) Absorbed (c) Refracted (d) Diffracted

26. During compression of moisture critical granules a hygroscopic substance used to maintain a proper moisture level is

- (a) Sorbitol (b) Tak (c) Acacia (d) Tragacanth

27. The integrated rate equation for a First order reaction is
- (a)  $x/a(a-x) = kt$  (b)  $\log a/(a-x) = 2.303/t$   
(c)  $\log a/(a-x) = kt/2.303$  (d)  $x = kt$
28. Which of the following is used as a local anesthetic in the formulation of parenteral products
- (a) Acetic acid (b) Benzyl alcohol  
(c) Ethyl alcohol (d) Sorbitol
29. In the formulation of suspensions for soft gelatin encapsulation base adsorption of the solid to be Suspended is expressed as:
- (a) The number of grams of liquid base required to produce a capsulable mixture when mixed with 1 gm of solid  
(b) The number of ml of liquid base required to produce a capsulable mixture when mixed with 1 gm of Solid  
(c) The number of grams of solid base required to produce a capsulable mixture when mixed with 1 gm of solid  
(d) The number of mgs of liquid base required to produce a capsulable mixture when mixed with 10 gms of solid
30. The drug that binds to  $AT_1$  receptor with high affinity is
- (a) Pinacidil (b) Valsartan (c) Moexipril (d) Ranolazine
31. A person taking nitroglycerine consumes alcohol. The drug interacts with alcohol and the effect seen is:
- (a) Severe hypotension and collapse (b) Drowsiness  
(c) Anticoagulant effect (d) Hypertension
32. The biogenetic origin of methyl substitution at  $N_1$ ,  $N_3$  and  $N_7$  in caffeine molecule is:
- (a) S-adenosyl methionine (b) S-methyl cysteine  
(c) S-methyl cysteine (d) Adenosyl mono phosphate
33. In WHO guidelines for the herbal drugs, contaminants include
- (a) Purines and Pyrimidine bases  
(b) Amino acids  
(c) Pentoses  
(d) Pesticidal residues, arsenic heavy metals, microbial load
34. The ratio of lecithin to sphingomyelin in amniotic fluid is measured
- (a) To obtain neonatal lipid profile  
(b) To assess fetal maturity and respiratory distress syndrome  
(c) To obtain age of the fetus  
(d) As a diagnostic marker for Tay-Sach's disease





40. Two of the following compounds give 3 signals in NMR spectroscopy. Choose the correct Combination

(P)  $\text{CH}_3\text{-COOH}$

(Q)  $\text{CH}_3\text{-CH}_2\text{-NH}_2$

(R)  $\text{CH}_3\text{-OH}$

(S)  $\text{CH}_3\text{-CH}_2\text{-CH}_2\text{Cl}$

Identify the correct statements:

(a) P, Q

(b) Q, S

(c) Q, R

(d) P, R

41. Conductance cells for conductivity measurements can be made from two of the following metals

(P) Mercury

(Q) Sodium

(R) Platinum

(S) Stainless steel

Identify the correct statements:

(a) P, R

(b) Q, S

(c) R, S

(d) P, Q

42. In aldehydes, the  $\text{-C=O}$  stretch and the  $\text{-C-H}$  stretch are approximately

(P)  $1725\text{ cm}^{-1}$

(Q)  $1660\text{ cm}^{-1}$

(R)  $2750\text{ cm}^{-1}$

(S)  $3300\text{ cm}^{-1}$

Identify the correct statements

(a) Q, S

(b) Q, R

(c) P, R

(d) P, S

43. Schedule 'C' and Schedule 'N' as per the Drugs and Cosmetics Act deal with the following

(P) Standards for cosmetics

(Q) Biological and special products

(R) Life period of drugs

(S) List of minimum equipments for the efficient running of a pharmacy

Identify the correct statements:

(a) P, Q

(b) Q, S

(c) R, S

(d) P, R

44. Abrasive and humectant compounds used in the formulation of toothpaste are

(P) Dicalcium phosphate

(Q) Sodium lauryl sulphate

(R) Sorbitol syrup

(S) Tragacanth

Identify the correct statements:

(a) P, R

(b) Q, S

(c) P, Q

(d) R, S

45. Two of the following types of techniques are used for depot formulation

(P) Dissolution controlled

(Q) Encapsulation type

(R) Solubilization

(S) Parenteral suspensions

Identify the correct statements

(a) P, Q

(b) Q, R

(c) P, S

(d) P, R

46. GABA, an important transmitter in the brain

(P) Is an inhibitory transmitter

(Q) Is an excitatory transmitter

(R) Increases chloride conductance

(S) Is antagonized by Naloxone

Identify the correct statements

(a) P, Q

(b) Q, R

(c) P, R

(d) R, S

47. Atrazine when combined with proguanil

- (P) Is highly effective and well tolerated (Q) Is not well tolerated  
(R) Antagonism is observed (S) Resistance is reduced

Identify the correct statements

- (a) P, Q (b) P, S (c) R, S (d) Q, R

48. G-CSF is a myeloid growth factor

- (P) Exhibits action similar to that of folic acid  
(Q) Has a remarkable ability to mobilize hemopoietic stem cells  
(R) Is activated by t-PA  
(S) Activates a phagocytic activity of mature neutrophils and prolongs their survival of circulation

Identify the correct statements

- (a) Q, S (b) P, Q (c) Q, R (d) R, S

49. Microscopical characters of cardamom are

- (P) Very thin membranous arillus enveloping the seed and composed of several layers of collapsed cells, yellow in colour containing oil  
(Q) Presence of anomocytic stomata on the epidermis of pericarp and mesocarp and containing lignified reticulate parenchyma  
(R) Vittae, the secretory canals contain volatile oil and are brown in colour  
(S) Inner epidermis of the pericarp are made up of polygonal tubular cells. Mesocarp includes few Brown to yellow coloured resinous cells

Identify the correct statements

- (a) Q, R (b) Q, S (c) P, S (d) P, R

50. Two of the following attributes are characteristic to a natural drug obtained from *Syzygium aromaticum*

- (P) Quadrangular stalked portion- the hypanthium, surmounted by four divergent lobes of sepals which surround a globular head <http://www.xamstudy.com>  
(Q) Powdered drug shows fragments of hypanthium showing the epidermis and the parenchyma containing large oil glands, singly occurring short fibres, cluster crystals of calcium oxalate  
(R) Aromatic, pungent, globular berries, remains of stigma at the apex. Kernel white and hollow at the Centre, consists of perisperm and endosperm  
(S) Tubular epidermal cells, followed by thin walled parenchymatous hypodermis with rectangular stone Cells. Pericarp and perisperm containing oil glands, abundant starch grains

Identify the correct statements

- (a) Q, R (b) P, Q (c) R, S (d) P, S

51. Two metabolites that could transiently accumulate as a result of inhibition of squalene synthase are

- (P) Dimethylallyl pyrophosphate (Q) Cholesterol  
(R) Farnesyl pyrophosphate (S) Prednisolone

Identify the correct statements

- (a) P, R (b) P, S (c) Q, R (d) P, Q

52. Two possible targets against which inhibitors can be designed for use in diabetes treatment are

(P) Carbonic anhydrase

(Q) Insulin

(R) Glycogen phosphorylase

(S) Glucose-6-phosphatase

Identify the correct statements:

(a) Q, S

(b) R, S

(c) P, R

(d) Q, R

53. Two important advantages of using micro-organisms for bio-transformations in drug synthesis are:

(P) Having been produced from micro-organisms, they are certain to have antibacterial properties

(Q) They are abundant in nature and hence reduce the processing cost significantly

(R) They produce the specific stereoisomer only

(S) They are highly selective and therefore yield products with high purity

Identify the correct statements:

(a) P, Q

(b) Q, R

(c) P, S

(d) R, S

54. Aminotransferases are directly involved in the biosynthesis of

(P) Aspartate

(Q) Alanine

(R) Oleate

(S) 3-phosphoglycerate

Identify the correct statements

(a) Q, S

(b) P, Q

(c) P, R

(d) Q, R

### (Q. 55-70) ARE MATCHING EXERCISES

55. **GROUP I**

Reactions

(P) p-nitrobenzaldehyde and acetone to form 1-(4-nitrophenyl-3-oxo-butene)

(Q) Isobutyl benzene is treated with acetyl chloride and anhydrous  $\text{AlCl}_3$

(R) Pregnelone acetate is saponified and then treated with an aluminium alcoholate to yield progesterone

(S) Benzelacetone and 4-hydroxy coumarin in presence of pyridine

(a) P-2, Q-4, R-1, S-3

(c) P-3, Q-1, R-2, S-4

**GROUP II**

Names

(1) Claisen-Schmidt condensation

(2) Michael condensation

(3) Friedel-Crafts acylation

(4) Oppenauer oxidation

(b) P-1, Q-3, R-4, S-4

(d) P-4, Q-1, R-2, S-3

56. N-substitution of 4-phenylpiperidine-4-ethyl-carboxylate derivatives results in analgesics with varying activities. Match the substitutions with activities

**GROUP I**

Substitution at N

- (P)  $-\text{CH}_3$
- (Q)  $-\text{CH}_2-\text{CH}_2-(\text{C}_6\text{H}_4)-\text{NH}_2$
- (R)  $-\text{CH}_2-\text{CH}_2-\text{C}-(\text{C}_6\text{H}_5)_2-\text{CN}$
- (S)  $-\text{CH}_2-\text{CH}_2-\text{C}_6\text{H}_5$
- (a) P-3, Q-1, R-4, S-2
- (c) P-1, Q-2, R-3, S-4

**GROUP II**

Analgesics

- (1) Fentanyl
- (2) Diphenoxylate
- (3) Pethidine
- (4) Anileridine
- (b) P-4, Q-2, R-3, S-1
- (d) P-3, Q-4, R-2, S-1

57. **GROUP I**

Drugs

- (P) Colestipolehydrochloride
- (Q) Clebopride
- (R) Cilazapril
- (S) Mentone
- (a) P-4, Q-2, R-3, S-1
- (b) P-1, Q-3, R-4, S-2

**GROUP II**

Nature and Function

- (1) Piradizino-diazepine derivative, angiotensin Converting enzyme inhibitor
- (2) Benzylpiperidine derivative, antiemetic
- (3) Benzophenone derivative, topical sun screening Substance
- (4) Granular copolymer of tetra ethylene and Epichlorohydrin, hypolipemic
- (b) P-2, Q-3, R-4, S-1
- (d) P-4, Q-2, R-1, S-3

58. **GROUP I**

Principle involved

- (P) Excitation of electrons
- (Q) Electron impact bombardment
- (R) Molecular vibration
- (S) Splitting of electron's magnetic energy
- (a) P-2, Q-1, R-3, S-4
- (b) P-3, Q-4, R-1, S-2

**GROUP II**

Instrument used

- (1) ESR spectrometer
- (2) IR spectrometer
- (3) Mass spectrometer
- (4) UV spectrometer
- (b) P-4, Q-3, R-2, S-1
- (d) P-1, Q-2, R-4, S-3

59. **GROUP I**

Drug

- (P) Albendazole
- (Q) Isoniazid
- (R) Sulfacetamide sodium
- (S) Paracetamol
- (a) P-1, Q-3, R-4, S-2
- (c) P-1, Q-2, R-3, S-4

**GROUP II**

Reagent for Assay

- (1) Ferric ammonium sulphate
- (2) Sodium nitrite
- (3) Per chloric acid
- (4) Potassium bromate
- (b) P-2, Q-4, R-1, S-3
- (d) P-3, Q-4, R-2, S-1



60. **GROUP I**

Method adopted

(P) Gas chromatography

(Q) Infra-red

(R) HPLC

(S) X-Ray diffraction

(a) P-1, Q-4, R-3, S-2

(c) P-3, Q-4, R-2, S-1

61. **GROUP I**

Film defects

(P) Orange peel effect

(Q) Blistering

(R) Cracking

(S) Bloom

(a) P-1, Q-2, R-4, S-3

(b) P-3, Q-4, R-2, S-1

62. **Group-I (term)**

(P) Hydrophilic suppository Base

(Q) Polymorphism

(R) Film former used in the Formation of nail lacquer

(S) Opaquant extender

(a) P-1, Q-2, R-3, S-4

(c) P-3, Q-4, R-2, S-1

63. **Group-I (Drug)**

(P) Toremifene

(Q) Flutamide

(R) Ketaconazole

(S) Miglitol

(a) P-2, Q-3, R-1, S-4

(c) P-4, Q-3, R-1, S-1

**GROUP II**

Physical state of sample used

(1) Solution

(2) Crystal

(3) Solid, liquid or gas

(4) Liquid or gas

(b) P-2, Q-3, R-1, S-4

(d) P-4, Q-3, R-1, S-2

**GROUP II**

Explanation

(1) Inadequate spreading of the coating solution before Drying causes a bumping effect on the coating

(2) It is the result of drying coated tablets in ovens, due to too Rapid evaporation of the solvent from the core and the Effect of high temperature on the film

(3) Occurs due to processing temperature used is too high for A particular formulation

(4) Occurs if internal stress in the film exceed the tensile Strength of the film

(b) P-2, Q-3, R-1, S-4

(d) P-4, Q-1, R-3, S-1

**Group-II (example)**

(1) Nitrocellulose

(2) Titanium dioxide

(3) Cocoa butter

(4) Polyethylene glycol

(b) P-2, Q-1, R-3, S-4

(d) P-4, Q-3, R-1, S-2

**Group-II (Type of action)**

(1) Inhibitor of adrenal and gonadal steroidogenesis

(2)  $\alpha$ -glucosidase inhibitor

(3) Androgen receptor antagonist

(4) Selective estrogen receptor modulator

(b) P-3, Q-2, R-1, S-4

(d) P-1, Q-4, R-2, S-3



64. The activities of certain object drugs are increased by certain precipitant drug choose the correct combination

**Group I**

Object drug

(P) Amines in foods

(Q) Alcohol

(R) Cefoxitin

(S) Azathioprine

(a) P-2, Q-1, R-3, S-4

(c) P-4, Q-1, R-2, S-3

**Group II**

Precipitant Drugs

(1) Allopurinol

(2) MAO inhibitor

(3) Disulfiram

(4) Probenecid

(b) P-3, Q-3, R-4, S-1

(d) P-4, Q-3, R-1, S-2

65. **Group I**

Drug

(P) Amines in foods

(Q) Alcohol

(R) Cefoxitin

(S) Azathioprine

(a) P-2, Q-1, R-3, S-4

(c) P-4, Q-1, R-2, S-3

**Group II**

Mechanism

(1) Allopurinol

(2) MAO inhibitor

(3) Disulfiram

(4) Probenecid

(b) P-2, Q-3, R-4, S-1

(d) P-4, Q-3, R-1, S-2

66. **Group I**

Plant Hormone Type

(P) Auxin

(Q) Gibberellin

(R) Cytokinin

(S) Growth inhibitor

(a) P-4, Q-3, R-1, S-2

(c) P-3, Q-2, R-1, S-4

**Group II**

Chemical Substance

(1) Abscisic acid

(2) NAA

(3) GA3

(4) 6-furfuryl amine

(b) P-4, Q-3, R-2, S-1

(d) P-2, Q-3, R-4, S-1

67. **Group I**

(Crude Drugs)

(P) Etoposide

(Q) Sumatra bensoin

(R) Ergot Powar

(S) Papaverine

(a) P-4, Q-1, R-2, S-3

(c) P-4, Q-3, R-1, S-2

**Group II**

(Chemical Test)

(1) Add a solution of potassium permanganate and warm; yield an odour of benzaldehyde

(2) To an alcoholic solution, add a solution of p-dimethylamino Benzaldehyde

(3) A solution in HCl acid when treated with k- ferricyanide; Yield and yellow color

(4) Alcoholic solution of the drug is treated with strong copper Solution; gives a brown precipitate

(b) P-1, Q-2, R-3, S-4

(d) P-3, Q-4, R-2, S-1

68. **Group I**

Synonyms of Crude drugs

- (P) Jesuits bark or Peruvian bark
- (Q) Ma-huang
- (R) Deadly night-Shade leaf
- (S) South American arrow
- (a) P-3, Q-4, R-2, S-1
- (c) P-2, Q-3, R-4, S-1

69. **Group I**

Aberrant protein

- (P) Glucose-6-phosphate dehydrogenase
- (Q) Prion
- (R)  $\beta$ -Subunit of haemoglobin
- (S) Phenylalanine hydroxylase
- (a) P-3, Q-1, R-2, S-4
- (c) P-1, Q-4, R-2, S-3

70. **Group I**

Antibiotic

- (P) Gentamicine
- (Q) Tetracycline
- (R) Streptomycine
- (S) Bacitracine
- (a) P-1, Q-2, R-3, S-4
- (c) P-2, Q-3, R-1, S-4

**Group II**

Chemical nature of constituents

- (1) Curare alkaloids
- (2) Tropane alkaloids
- (3) Quinoline alkaloids
- (4) Phenylethylamine alkaloids
- (b) P-1, Q-4, R-2, S-3
- (d) P-4, Q-1, R-3, S-2

**Group II**

Disease

- (1) Haemolytic anaemia
- (2)  $\beta$ -Thalassaemia
- (3) Scrapie
- (4) Phenylketonuria
- (b) P-1, Q-3, R-2, S-4
- (d) P-2, Q-4, R-3, S-1

**Group II**

Test organism for microbiological assay I.P.

- (1) *Bacillus cereus*
- (2) *Bacillus subtilis*
- (3) *Micrococcus luteus*
- (4) *Staphylococcus epidermidis*
- (b) P-3, Q-1, R-4, S-2
- (d) P-4, Q-1, R-2, S-3

**Common data for (Q. 71 - 73)**

All anthracycline antibiotic doxorubicin, is an important anticancer drug

71. Doxorubicin is isolated from

- (a) *Streptococcus pyogenes*
- (b) *Staphylococcus aureus*
- (c) *Clostridium difficile*
- (d) *Streptomyces neocetrus varcaesius*

72. Doxorubicin acts by

- (a) Inhibiting asparaginase
- (b) Inhibiting topoisomerase II
- (c) Inhibiting adenosine deaminase
- (d) Inhibiting functions of microtubules

73. A significant adverse action of doxorubicin is

- (a) A potentially irreversible cumulative dose related cardiac toxicity
- (b) Hematuria
- (c) Sedation
- (d) Fluid retention

### Common data for (Q. 74 - 75)

An antidiabetic drug is 1-[4-[2][5-chloro-2-methoxybenzamido) ethyl]-phenyl]-3-cu;cpjexulrea

74. The generic name of the antidiabetic drug is

- (a) Glibenclamide (b) Gliciazide  
(c) Glipizide (d) Gliquidone

75. Official assay for the drug is by throtion using a standard solution of

- (a) Sodium nitrite (b) Iodine  
(c) Potassium permanganate (d) Sodium hydroxide

### Linked answer Questions: (Q. 76 - 85)

Statement for linked answer Questions 76 and 77

Imidazole is treated with w-bromo-2, 4 dichloracetophenone. The resulting product on reaction with  $\text{Na BH}_4$  gives and intermediate X, X is then treated with NaH followed by 2,4 dichlorobenzyl bromide to get an antifungal drug.

76. The intermediate compound X is

- (a) 1-(2,4 Dicholoro phenyl)-2-(1-imidazolyl)-methanol  
(b) 1-(2,4 Dicholoro batyl)-2-(2-imidazolyl)-ethanol  
(c) 1-(2,4 Dicholoro acetophenyl)-2-(1-imidazolyl)-ethanol  
(d) 1-(2,4 Dicholoro phenyl)-2-(1-imidazolyl)-ethanol

77. The antifungal drug obtained is

- (a) Miconazole (b) Lanaconazole  
(c) Sapcrconazole (d) Butenafine

Statement for linked Answer Question 78 and 790

The calculated  $\lambda_{\text{max}}$  for 2,4 Penta diene is 222 nm. Choose the correct base value and increment due to the substituent. <http://www.xamstudy.com>

78. The base value (in nm) is

- (a) 215 (b) 210 (c) 217 (d) 205

79. The increment due to the substituent (in nm) is

- (a) 7 (b) 12 (c) 17 (d) 5

Statement for linked answer Questions 80 and 81

A solution of the drug was freshly prepared at a concentration of 600 mg/ml . After 30 days of Storage at 25°C, the drug concentration in the solution was found to be 150 mg/ml. The drug can be assumed to undergo zero order kinetics

80. The rate constant is

- (a) 15 mg/ml/day (b) 1.5 mg/ml/day  
(c) 0.15 mg/ml/day (d) 7.5 mg/ml/day

81. Half life of the drug solution under these condition is

- (a) 2 days                      (b) 20 days                      (c) 10 days                      (d) 100 days

**Statement for linked answer questions 82 and 83**

**There are many types of antidepressant drugs and many of them are long acting, while some are short acting**

82. An example of a short acting antidepressant drug is

- (a) Fluoxetine                      (b) Valproate                      (c) Etorphine                      (d) Moclobemide

83. The drug selected above, acts by

- (a) Inhibiting MAO-A                      (b) Inhibiting Na/5HT reuptake  
(c) Blocking 5-HT<sub>3</sub> receptors                      (d) Inhibiting ACE

**Statement for linked Answer Questions 84 and 85**

**Myristica frangrans belongs to the family Myristicaceae**

84. A part of the fruit of Myristica frangrans Houtt is

- (a) Testa                      (b) Plumule                      (c) Mace                      (d) Anther

85. The substance present in that part selected above, which produces a red color with iodine, is

- (a) Myristicin                      (b) Safrole                      (c) Elimicin                      (d) Amylodextrin

**End of paper**

**ANSWER KEY GATE 2006**

1 - d	2 - a	3 - c	4 - d	5 - c	6 - d
7 - b	8 - a	9 - b	10 - a	11 - b	12 - d
13 - c	14 - b	15 - a	16 - a	17 - c	18 - c
19 - b	20 - c	21 - c	22 - b	23 - d	24 - c
25 - b	26 - a	27 - c	28 - b	29 - a	30 - b
31 - a	32 - a	33 - d	34 - b	35 - a	36 - a
37 - b	38 - d	39 - a	40 - b	41 - a	42 - c
43 - b	44 - a	45 - c	46 - c	47 - b	48 - a
49 - c	50 - b	51 - a	52 - b	53 - d	54 - b
55 - b	56 - d	57 - d	58 - b	59 - d	60 - d
61 - a	62 - d	63 - c	64 - b	65 - a	66 - d
67 - a	68 - a	69 - b	70 - d	71 - d	72 - b
73 - a	74 - a	75 - d	76 - d	77 - a	78 - a
79 - a	80 - a	81 - b	82 - d	83 - a	84 - c
85 - d					

# GPAT QUESTION PAPER 2005 WITH ANSWER KEY

## PHARMACEUTICAL SCIENCE

Time : 3 hours

Maximum Marks : 150

### (Q. 1 - 30) CARRY ONE MARK EACH

- If the Carr's index of a powder is 10 % then the type of powder flow is  
(a) Poor (b) Excellent (c) Very poor (d) Good
- Mixing of semisolids is carried out using  
(a) Double cone mixer (b) Rotating cube mixer  
(c) Planetary mixer (d) Fluidized bed mixer
- In the preparation of small pox vaccine, the drying process used is  
(a) Spray drying (b) Vacuum drying (c) Drum drying (d) Freeze drying
- In cosmetic preparations, an oxidant used in an aqueous system, is  
(a) Sodium formaldehyde sulphonylate (b)  $\alpha$ -Tocopherol  
(c) Methyl paraben (d) Phenol
- In tablet coating process, inadequate spreading of the coating solution before drying causes  
(a) Orange peel effect (b) Sticking effect (c) Blistering effect (d) Picking effect
- Presence of one of the following characteristics show that the Rauwolfia serpentine is adulterated with other species of Rauwolfia.  
(a) Compound starch grains (b) Cluster crystals of calcium oxalate  
(c) Lignified sclerides (d) Unlignified pericyclic fibres
- Chinese rhapontic rhubarb can be distinguished from Indian rhubarb by fluorescence developed in UV light which is  
(a) Deep yellow (b) Deep violet (c) Green (d) Blue
- Citrus flavonoids are rich in  
(a) Aesculetin (b) Fraxin (c) Hesperidin (d) Scopoletin
- The quantitative values determined for the identification of leaf drugs remain constant throughout the age of plant EXCEPT  
(a) Stomatal number (b) Veinlet termination number  
(c) Veinlet number (d) Stomatal Index
- The alkaloid which inhibits the cholinesterase undergoes hydrolysis in solution to give methyl carbamic acid and eseroline is  
(a) Scopolamine (b) Pyridostigmine (c) Neostigmine (d) Physostigmine
- Luminescence is the term applied to  
(a) Absorbed radiation (b) Re-emission of previously absorbed radiation  
(c) Excited radiation (d) Transmitted radiation

12. Polarogram of a solution containing an electro-reducible substance is obtained by plotting
- (a) Current vs. Volume (b) Current vs. Potential  
(c) Resistance vs. Time (d) Potential vs. Volume
13. Silica gel used in most of the absorbent columns contains -OH groups. So it is
- (a) Basic (b) Neutral  
(c) Acidic (d) Both acidic and basic
14. The electronic transition possible in  $\text{Br}_2$  is
- (a)  $\sigma - \sigma^*$  (b)  $\sigma - \sigma^*$  and  $n - \sigma^*$   
(c)  $\sigma - \pi^*$  and  $\pi - \pi^*$  (d)  $n - \pi^*$  and  $\sigma - \pi^*$
15. Ferrous ion is very weakly colored for colorimetric analysis. It can be converted into a highly colored complex using
- (a)  $\text{H}_2\text{SO}_4$  (b) PDAB  
(c) Thymol blue (d) 1:10-Phenanthroline
16. Prazepam, Oxazepam, Clonazepam are structurally similar and have the system
- (a) 5H-Dibenz (b, f) azepine (b) 1,2,4-Benzothiadiazepine  
(c) Benzodiazepine (d) Phenothiazine
17. 11  $\beta$ , 21-Dihydroxy pregn-4-ene-3,18,20-trione is
- (a) Aldosterone (b) Progesterone  
(c) Cholesterol (d) Cortisone
18. 4, 7-Dichloroquinoline on treatment with 4-amino phenol gives
- (a) 7-chloro-2-(2-hydroxy phenyl amino) quinoline  
(b) 7-chloro-4-(4-amino phenyl) Quinoline  
(c) 7-chloro-4-(4-hydroxy phenyl amino) quinoline  
(d) 4-chloro-7-(4-Hydroxy phenyl amino) quinoline
19. Ecgonine, a hydrolytic product of cocaine on treatment with chromium trioxide gives a keto acid, which on thermal decarboxylation results in
- (a) Atropic acid (b) Tropic acid (c) Pseudo cocaine (d) Tropinone
20. A natural product derivative developed as an antimalarial is
- (a) Artemether (b) Paludrine (c) Pyrimethamine (d) Halofantrine
21. 'Ternary complex' refers to the state when
- (a) An enzyme forms a covalent complex with its substrate  
(b) An enzyme forms a non covalent complex with either a substance or a product  
(c) An enzyme that catalyses a reaction with two or more substrates, is concurrently complexed with both substrates  
(d) An enzyme complexed to a product, just after catalysis
22. The most important clue that helped in the determination of the double helical structure of DNA came from
- (a) Chargaff's rules (b) Hershey-Chase experiment  
(c) Avery-MacLeod-McCarty experiment (d) Nirenberg and Khorana's codon assignments



23. Diversity in antibody molecules is brought about by
- (a) Post-translational modifications (b) Gene rearrangements  
(c) Usage of special genetic codes (d) Multiple mutations in the polypeptides
24. The etiological agent of infectious mononucleosis, also associated with a form of Burkitt's lymphoma is
- (a) Varicella Zoster Virus (b) Epstein Barr Virus  
(c) Picorna Virus (d) Papovavirus
25. Tissue plasminogen activator that disperses blood clots, beneficial if it is given within
- (a) 3 days (b) 9 hours (c) 3 hours (d) 24 hours
26. An anticholinestrase which is useful in Alzheimer's disease is
- (a) Arecoline (b) Donepezil (c) Isoproterenol (d) Clioquinol
27. A drug is used as an ophthalmic solution in Herpes keratitis is
- (a) Zalcitabine (b) Trifluridine (c) Ritonavir (d) Stavudine
28. A macrolide antibiotic used as a powerful immunosuppressive agent is
- (a) Erythromycin (b) Azithromycin (c) Tacrolimus (d) Clarithromycin
29. Cytosine arabinoside acts on this phase of the cell cycle
- (a) G<sub>1</sub> (b) G<sub>2</sub> (c) M (d) S
30. The chairman of the Drugs Technical Advisory Board is
- (a) The drugs Controller of India  
(b) The Director, Central Drugs Laboratory, Kolkata  
(c) The President, Pharmacy Council of India  
(d) The Director General of Health Services
31. Predict the product obtained by treating 6 - chloro-3,5-diamino pyrazin-2-methyl carboxylate with Guanidians
- (a) Amiloride (b) Hydrochlorothiazide  
(c) Triamterene (d) Furosemide
32. 2-hydroxy-5,9-dimethyl-6,7-benzomorphan derivative is
- (a) Pentazocine (b) Hydrocodone  
(c) Codeine (d) Buprenorphine
33. The raw materials used for the synthesis of Sulfalen are
- (a) 4-acetamido benzene sulfonyl chloride and 2-amino-4-methyl pyrimidine  
(b) 4-acetamido benzene sulfonyl chloride and 5-amino-2-ethyl-1,3,4-thiadiazole  
(c) 4-acetamido benzene sulfonyl chloride and 5-amino-3,4-dimethyl isoxazole  
(d) 4-acetamido benzene sulfonyl chloride and 3-amino-2-methoxy pyrazine
34. Phexon benzamine can be prepared from
- (a) Phenol and propylene oxide (b) 3-phenylpropanol  
(c) Phthalic anhydride (d) p-phenyl succinic acid

35. Glycyrrhizin, a sweet principle of liquorice is
- (a) K and Mg salts of glycyrrhizinic acid (b) Na and Mg salts of glycyrrhetic acid  
(c) K and Ca salts of glycyrrhizinic acid (d) Na and Ca salts of glycyrrhetic acid
36. Allopolyploids are derived from
- (a) A single parental species genome (b) More than one parental species genomes  
(c) A plant with haploid number of chromosomes (d) A plant with diploid number of chromosomes
37. The most effective method for producing virus-free plants is
- (a) Root culture (b) Meristem culture  
(c) Somatic embryogenesis (d) Floriculture
38. A person taking organic nitrate has to avoid one of the following drugs as it can cause severe hypotension
- (a) Aspirin (b) Cholestyramine (c) Warfarin (d) Sildenafil
39. To avoid lithium toxicity, a patient using lithium carbonate for mood disorders should not be prescribed
- (a) Acetazolamide (b) Hydrochlorothiazide  
(c) Mannitol (d) Propranolol
40. A selective serotonin reuptake inhibitor used as an antidepressant is
- (a) Venlafaxine (b) Selegiline (c) Phenelzine (d) Amoxapine
41. A patient receiving Digoxin for CCF is found to have elevated serum cholesterol. Which hypolipidemic agent should not be prescribed
- (a) Clofibrate (b) Cholestyramine (c) Lovastatin (d) Niacin
42. In the study of enzyme kinetics,  $V_{max}$  is said to be attained when
- (a) There is an excess of free enzyme as compared to the substrate  
(b) Virtually all of the enzyme is present as the enzyme-substrate complex and concentration of the free enzyme is vanishingly small <http://www.xamstudy.com>  
(c) The maximum velocity of the reaction in the presence of low substrate concentration  
(d) When the concentration of free enzyme equals that of the enzyme-substrate complex
43. Serum sample of a patient shows elevated levels of  $\gamma$ -glutamyl transferase. The patient could be suffering from
- (a) Kidney disorder (b) Liver disease  
(c) Parkinson's disease (d) Myocardial infarction
44. Acid-fast organisms are seen in the sputum of a 48-year old alcoholic man. A test to confirm whether he needs long-term multi-drug treatment for tuberculosis is
- (a) Chest X-ray (b) Ziehl-Neelsen stain of the sputum  
(c) Sputum cytology (d) Mycobacterial cultures of the sputum
45. The distinguishing feature in IR spectra between propionaldehyde and acetone is
- (a) Weak C-H stretching and out of plane bending in propionaldehyde  
(b) Keto group in acetone  
(c) Two methyl groups in acetone  
(d)  $-\text{CH}_2$  group in propionaldehyde

46. Nephelometrical measurement are most sensitive for  
 (a) Clear solution (b) Concentrated solution  
 (c) Thick suspensions (d) Very dilute suspension
47. The number of peaks shown by diethyl ether in an NMR spectrum are  
 (a) Four (b) Two (c) One (d) Five
48. The half-life for a zero order reaction is calculated using  
 (a)  $t_{1/2} = 0.693/k$  (b)  $t_{1/2} = 2.303/k$  (c)  $t_{1/2} = 1/ak$  (d)  $t_{1/2} = a/2k$
49. The biological half-life of procaine in patient was 35 minutes and its volume of distribution was estimated to be 60 L. The total clearance rate of procaine is  
 (a) 1.1881L/min (b) 0.115L/min (c) 11.5L/min (d) 5.57L/min
50. The ratio of the void volume to the bulk volume of the packing of the powder is called as  
 (a) Porosity (b) True density (c) Granular density (d) Bulk density
51. A co-solvent used in the preparation of parenteral products is  
 (a) Benzyl alcohol (b) Methyl alcohol (c) Dimethyl acetamide (d) Phenol

**(Q.52-58)**

**MULTIPLE SELECTION ITEMS. P, Q, R, S ARE OPTION. TWO OF THESE OPTION ARE CORRECT. CHOOSE THE CORRECT COMBINATION AMONG A, B, C AND D.**

52. In mass spectroscopy, positively charged ions be produced by  
 (P) Heating of the sample  
 (Q) Bombarding the sample with high energy electrons  
 (R) Bombarding the sample with high energy protons  
 (S) Chemical ionisation  
 (a) Q, S (b) Q, R (c) P, R (d) P, S
53. A plasticizer and a high boiling point solvent used in the preparation of nail lacquers are  
 (P) Butyl stearate (Q) Ethyl lactate  
 (R) Ethyl alcohol (S) Acetone  
 (a) P, Q (b) Q, S (c) R, S (d) Q, R
54. Two of the following attributes are true for describing  
 (P) Neuromuscular blocking causing spastic paralysis  
 (Q) Blocks the response of the Ascaris muscle to ACH, causing flaccid paralysis in the worms  
 (R) Inhibits the Helminth specific enzyme fumarate reductase  
 (S) Arrest nematode cell divisions in metaphase by interfering with microtubule assembly  
 (a) P, Q (b) P, R (c) Q, S (d) Q, R
55. The colour and flavor of saffron are due to -  
 (P) Crocin (Q) Crocetin (R) Safranal (S) Crocophanic acid  
 (a) R, S (b) P, R (c) Q, S (d) Q, R

56. Predict the two impurities which are likely to be present in Glipizide
- (P) 5-methyl-N-[2-(4-sulphamoyl phenyl ethyl)] pyrazin-2- carboxamid  
 (Q) 5-methyl-N-[2-(2-sulphamoyl phenyl)] pyrazine-2-carboxamide  
 (R) Cyclohexanamine  
 (S) Cyclohexane
- (a) P, R                      (b) P, Q                      (c) R, Q                      (d) R, S
57. Calcipotrience, synthetic vitamin D<sub>3</sub> analogue has the following attributes
- (P) Pronounced antirachitic activity  
 (Q) Inhibits epidermal cell proliferation and enhances cell differentiation  
 (R) Used as a topical application in the treatment of moderate plaque psoriasis  
 (S) Effect on calcium metabolism is 200 times more than Ergocaliferol
- (a) Q, R                      (b) P, Q                      (c) R, S                      (d) Q, S
58. Insulin when released from the pancreatic β cells
- (P) Can sequester blood glucose by forming a complex with it.  
 (Q) Gets fully conjugated with glucuronic acid immediately, to be released upon suitable stimuli in normal health.  
 (R) Acts on the transporter molecules to facilitate glucose movement across the cell membranes  
 (S) Increases storage of glucose to glycogen in the liver
- (a) R, S                      (b) P, R                      (c) Q, S                      (d) Q, P

(Q. 59-65) ARE "MATCHING" EXERCISES.

MATCH GROUP I WITH GROUP II CHOOSE THE CORRECT COMBINATION AMONG THE ALTERNATIVES A,B,C AND D.

59. **Group- I**

- (P) Ascorbic acid  
 (Q) Pyridoxine HCl  
 (R) Dapsone  
 (S) Fluorouracil  
 (a) P -1, Q-4, R-3, S-2  
 (c) P -4,Q-2, R-1, S-3

**Group- II**

- (1) TBAH  
 (2) Iodine  
 (3) HClO<sub>4</sub>  
 (4) Sodium nitrite  
 (b) P -1, Q-4, R-3, S-2  
 (d) P -3,Q-2, R-4, S-1

60. **Group- I**

**Umbelliferous fruit**

- (P) Fennel  
 (Q) Indian Dill  
 (R) Coriander  
 (S) Anise  
 (a) P-1, Q-2, R-3, S-4  
 (c) P-2, Q-3, R-4, S-1

**Group- II**

**Diagnostic character**

- (1) Wavy sclerenchyma  
 (2) Branched and unbranched vittae  
 (3) Reticulately lignified parenchyma  
 (4) Lateral ridges with vascular bundles  
 (b) P-3, Q-4, R-1, S-2  
 (d) P-4, Q-1, R-2, S-3

61. **Group- I**

**Enzyme systems responsible for Phase 2 conjugation pathways**

- (P) UDP-glucuronyl transferase
  - (Q) ATP-sulfurylase & APS-Phosphokinase
  - (R) Acyl synthetase & transacetylase
  - (S) ATP-methionine adenosine transferase and methyl transferase
- (a) P-1, Q-4, R-3, S-2  
(c) P-3, Q-2, R-4, S-1

62. **Group-I**

**Drug**

- (P) Levofloxacin
  - (Q) Econazole
  - (R) Pentostatin
  - (S) Procarbazine
- (a) P -3, Q-2, R-1, S-4  
(c) P -1, Q-2, R-4, S-3

63. **Group-I**

**Terms**

- (P) Saturated air
  - (Q) Dew point
  - (R) Humid volume
  - (S) Humidity
- (a) P -1, Q-4, R-2, S-3  
(c) P -3, Q-1, R-4, S-2

**Group- II**

**Types**

- (1) N-methylation
  - (2) Sulphate conjugation
  - (3) Glucuronidation
  - (4) Amino acid conjugation
- (b) P-2, Q-3, R-1, S-4  
(d) P-4, Q-1, R-2, S-3

**Group-II**

**Mechanism**

- (1) Inhibits adenosine deaminase
  - (2) Inhibits topoisomerase II
  - (3) Forms adducts with DNA
  - (4) Interferes with amino acid transport by action on the membrane
- (b) P -2, Q-4, R-1, S-3  
(d) P -4, Q-2, R-3, S-1

**Group-II**

**Explanation**

- (1) Pounds of water vapour carried by one pound of dry air under any given set of conditions
  - (2) The water vapour is in equilibrium with liquid Water at the given conditions of temperature and pressure
  - (3) The volume is cubic feet occupied by one Pound of dry air and its accompanying water vapour
  - (4) Temperature to which a mixture of air and Water vapour must be cooled in order to Become saturated
- (b) P -4, Q-3, R-1, S-2  
(d) P -2, Q-4, R-3, S-1



64. **Group-I**

**Antibiotic**

- (P) Bleomycin
- (Q) Nystatin
- (R) Carbenicillin
- (S) Streptomycin
- (a) P -2, Q-4, R-1, S-3
- (c) P -3, Q-2, R-4, S-1

65. **Group-I**

**Pathoimmunological condition**

- (P) Urticaria
- (Q) Autoimmune thrombocytopenia
- (R) Rheumatoid arthritis
- (S) Organ transplant rejection
- (a) P -1, Q-2, R-4, S-3
- (c) P -3, Q-1, R-2, S-4

**Group II**

**Test organism for microbiological assay IP**

- (1) *Pseudomonas aeruginosa*
- (2) *Mycobacterium segmatis*
- (3) *Bacillus subtilis*
- (4) *Saccharomyces cerevisiae*
- (b) P -4, Q-1, R-3, S-2
- (d) P -3, Q-1, R-2, S-4

**Group-II**

**Drugs used in the treatment**

- (1) Cyclosporin
- (2) Antihistamines
- (3) Intravenous immunoglobulin
- (4) Glucocorticoids
- (b) P -4, Q-1, R-3, S-2
- (d) P -2, Q-3, R-4, S-1

**DATA FOR Q.66-80 ARE BASED ON THE STATEMENT/ PROBLE.CHOOSE THECORRECT ANSWER FOR QUESTION FROM THE OPTION A,B,C AND D**

**COMMON DATA FOR QUESTIONS 66,67**

*A sample of Cinnamoman zeylanicum purchased from the market was evaluated for its authenticity.*

66. It shows

- (a) Presence of cork and cortex
- (b) Absence of cork and cortex
- (c) Absence of phloem fibres
- (d) Presence of xylemparenchyma

67. Volatile oil should not be less than

- (a) 0.05%
- (b) 0.20%
- (c) 0.50%
- (d) 1.00%

**COMMON DATA FOR QUESTIONS 68, 69, 70**

*Choroactiacid and hydrazine are treated with X to get semicarbazido acetic acid in which ring closure takes place to 1-amino hydantoin. It is subsequently treated with 2-duacetoxy methyl-5-nitrofurane to get nitrofurantoin.*

68. Reagent 'X' is

- (a) Cuprous chloride
- (b) Potassium cyanate
- (c) Silver nitrate
- (d) Mercurous chloride

69. Its IUPAC name is

- (a) 1-(5-nitrofurfuryl)hydantoin
- (b) 1-(5-nitrofurfuryl hydroxy)hydantoin
- (c) 1-(5-nitrofurfuryl amino)hydantoin
- (d) 1-(5-nitrofurfuryl nitro)hydantoin

70. Its gastrointestinal tolerance can be improved without interfering with oral absorption by preparing a

- (a) Solid dispersion
- (b) Prodrug
- (c) Large cyrsalline form (Macrofantian)
- (d) Suspension



### COMMON DATA FOR QUESTIONS 71, 72

A compound 'X' with molecular formula  $C_2H_4O$  exhibits a strong absorption band at  $1730\text{ cm}^{-1}$  in IR spectrum. On reduction is converted into 'Y' which shows a strong band at  $3640\text{ cm}^{-1}$ .

71. Assign the band in X to

- (a)  $CH_3$                       (b)  $C=C$                       (c)  $C=O$                       (d)  $CH_2C=O$

72. The strong band in Y is due to

- (a)  $-C-C$                       (b)  $-C-O-C-$                       (c)  $=CH_2$                       (d)  $-OH$

### COMMON DATA FOR QUESTION 73, 74, 75

*In the management of asthma, the drugs used are salmeterol, Zafirlukast, Budesonide, Nedocromil sodium and Bambuterol*

73. Zafirlukast acts as

- (a)  $\beta_2$  adrenoceptor agonist                      (b) Cysteinyl-leukotriene receptor antagonist  
(c) Muscarinic receptor antagonist                      (d) Antihistamine

74. A prodrug of terbutaline is

- (a) Zafirlukast                      (b) Salmeterol  
(c) Bambuterol                      (d) Nedocromil sodium

75. Warfarin interacts with this antiasthmatic drug and increases prothrombin time

- (a) Budesonide                      (b) Zafirlukast                      (c) Salmeterol                      (d) Bambuterol

### COMMON DATA FOR QUESTIONS 76, 77, 78

*In a pharmaceutical industry, batch filtration of liquids where the proportion of solids to liquids is high is to be carried out. The complete recovery of solids is required. After filtration, the filtrate, which is corrosive, gives a crystalline product on evaporation. The liquid tends to deposit scales or crystals on the heating surface during evaporation.* <http://www.xamstudy.com>

76. The suitable filtration equipments is

- (a) Plate and frame filter press                      (b) Leaf filters  
(c) Meta filters                      (d) Membrane filters

77. The filter aid used in the above filtration is

- (a) Sand                      (b) Nylon fiber cloth  
(c) Activated carbon                      (d) Filter paper

78. A suitable evaporator is

- (a) Falling film evaporator                      (b) Forced circulation evaporator  
(c) Vertical                      (d) Horizontal evaporator

### COMMON DATA FOR QUESTION 79, 80

*Isoprenoid biosynthesis is involved in the production of many biologically important compounds such as cholesterol, Steroid hormones, Vitamin K, Vitamin E and bile acid.*

79. HMG-CoA reductase, a key enzyme in the pathway, catalyzes
- Side-chain cleavage in the conversion of cholesterol to steroid hormones.
  - The reduction of the thio-ester group to an alcohol in mevalonate biosynthesis.
  - The reduction of the hydroxyl group mevalonate to Vitamin D.
  - Steroid condensation reaction in biosynthesis of bile acids.
80. The inhibition of HMG-CoA reductase is a strategy used in the treatment of
- Familial hypercholesterolemia
  - Vitamin K deficiency
  - Inflammation in the joints
  - Hepatic parenchymal diseases

**LINKED ANSWER QUESTIONS : Q. 81a TO Q. 85b CARRY TWO MARKS EACH**

**Statements for linked Answer Questions 81a & 81b:**

*A person after orthopaedic surgery is prescribed a selective COX-2 inhibitor*

81a. The selective COX-2 inhibitor is

- Ketorolac
- Refecoxib
- Indomethacin
- Naproxen

81b. The drug selected is not be given, if the patient is already taking

- Antiallergic drugs
- Anxiolytic drugs
- Antihypertensive drugs
- Oral antidiabetic agents

**Statement for Linked Answer Questions 82a & 82b:**

*A drug solution has an initial potency of 300 mg/10 ml. When stored in a refrigerator for 30 days, its potency was found to be 100mg/ 10ml*

82a. The rate constant, assuming that the drug solution undergoes first order kinetics, is

- 0.0366 day<sup>-1</sup>
- 0.0074 day<sup>-1</sup>
- 0.0174 day<sup>-1</sup>
- 0.0506 day<sup>-1</sup>

82b. Half-life of the drug solution, under these condition is

- 9.4 days
- 19 days
- 47 days
- 4.7 days

**Statement for Linked Answer Questions 83a & 83b**

*Ginger is a widely used herbal drug, containing many chemical constituents.*

83a. The pungent principal present in it, is

- Zingiberol
- Zingiberene
- Gingerol
- Cineole

83b. Its decomposition product, on boiling with 2% KOH is

- Zingiberone
- Shogaol
- Gingedio
- Gingediol acetate

**Statement for Linked Answer Questions 84a & 84b:**

*2,6-dimethylphenol and chloroacetone reaction gives 'X', which on treatment with hydroxylamine and hydrochloric acid gives intermediate product. This on further treatment with Raney nickel in acid, gives the final product.*

84.a. The product 'X' is

- (a) 1-(2,6-Dimethyl phenoxy)-2-propanone (b) 1-(2,6-Dimethyl phenoxy)-2-butanone  
(c) 1-(2,6-Dimethyl phenoxy)-2-isopropanone (d) 1-(2,6-Dimethyl phenoxy)-2-pentanone

84b. The final product is

- (a) 1-methyl-2-(2,6-xylyloxy) isopropylamine (b) 1-methyl-2-(2,6-xylyloxy) ethylamine  
(c) 1-methyl-2-(2,6-xylyloxy) butylamine (d) 1-methyl-2-(2,6-xylyloxy) pentylamine

**Statement for Linked Answer Questions 85a & 85b:**

*An organic compound 'X' has an absorption maxima at 217 nm. Its  $e_{max}$  is 16,000. The absorbance is 0.64 when the cell length is 1 cm.*

85a. The molar concentration of 'X' is

- (a)  $5 \times 10^{-5}$  (b)  $4 \times 10^{-5}$  (c)  $4 \times 10^{-4}$  (d)  $5 \times 10^{-2}$

85b. The molar weight is 56.06, its concentration in gms/ml is

- (a)  $2.5 \times 10^{-6}$  (b)  $0.25 \times 10^{-6}$  (c)  $5 \times 10^{-5}$  (d)  $2.24 \times 10^{-6}$

**End of paper**

**ANSWER KEY GATE 2005**

1 - b	2 - c	3 - d	4 - b	5 - a	6 - c
7 - d	8 - c	9 - a	10 - d	11 - b	12 - b
13 - c	14 - b	15 - d	16 - c	17 - a	18 - c
19 - d	20 - a	21 - c	22 - b	23 - d	24 - b
25 - a	26 - b	27 - b	28 - c	29 - d	30 - b
31 - a	32 - a	33 - d	34 - a	35 - c	36 - b
37 - b	38 - d	39 - b	40 - a	41 - b	42 - b
43 - b	44 - d	45 - a	46 - a	47 - b	48 - d
49 - b	50 - a	51 - c	52 - a	53 - a	54 - b
55 - b	56 - a	57 - c	58 - b	59 - b	60 - b
61 - c	62 - b	63 - d	64 - a	65 - d	66 - b
67 - d	68 - b	69 - c	70 - c	71 - c	72 - d
73 - b	74 - c	75 - b	76 - a	77 - a	78 - a
79 - b	80 - a	81 - a, b	81 - b, c	82 - a, a	82 - b, b
83 - a, c	83 - b, b	84 - a, a	84 - b, b	85 - a, b	85 - b, d

# GPAT QUESTION PAPER 2004 WITH ANSWER KEY

## PHARMACEUTICAL SCIENCE

Time : 3 hours

Maximum Marks : 150

Read the following instruction carefully.

1. This question paper contains 90 objective questions. Q. 1-30 carry 1 mark each and Q. 31-90 carry two marks each.
2. Answer all the questions.
3. Questions must be answered on special machine gradable Objective Response Sheet (ORS) by darkening the appropriate bubble (marked A, B, C, D) using HB pencil against the question number on the left hand side of the ORS. Each question has only one correct answer. In case you wish to change an answer, erase the old answer completely using a good soft eraser.
4. There will be NEGATIVE marking. For each wrong answer, 0.25 mark for Q. 1-30 and 0.5 mark for Q. 31-90 will be deducted. More than one answer marked against a question will be deemed as an incorrect response and will be negative marked.
5. Write your registration number, name and name of the Centre at the specified locations on the right half of the ORS.
6. Using HB pencil, darken the appropriate bubble under each digit of your registration number.
7. Using HB pencil, darken the appropriate bubble under the letters corresponding to your paper code.
8. No charts or tables are provided in the examination hall.
9. Use the blank pages given at the end of the question paper for rough work.
10. Choose the closest numerical answer among the choices given.
11. This question paper contains 20 pages. Please report, if there is any discrepancy.

### (Q. 1 - 30) CARRY ONE MARK EACH

1. The structural feature common for propranolol, atenolol, pindolol, metoprolol in the side chain is
  - (a) Isopropyl amino propan-2-ol
  - (b) Dimethyl amino propan-2-ol
  - (c) Diethyl amino propan-2-ol
  - (d) Dibutylamino propan-2-ol
2. When N-methyl group of morphine is replaced with an allyl group, the compound formed is
  - (a) Naloxone-morphine antagonist
  - (b) Naltrexone-morphine antagonist
  - (c) Nalorphine-morphine antagonist
  - (d) Nalbuphine-morphine agonist/antagonist
3. Nitrazepam can be synthesized from
  - (a) 2-Bromo-5-amino benzophenone
  - (b) 2-Nitro-2-chloro acetophenone
  - (c) 2-Amino-5-nitro cyclohexanone
  - (d) 2-Amino-5 nitro-benzophenone
4. Clavulanic acid has a beta lactam ring fused to
  - (a) Thienyl system
  - (b) Thiodiazole system
  - (c) Thiazolidine system
  - (d) Oxazolidine system

5. A drug which has antipyretic, anti-inflammatory and antiplatelet activity is
  - (a) Sulfinpyrazone
  - (b) Aspirin
  - (c) Ticlopidine
  - (d) Acetaminophen
6. Wild cherry bark contains prunasin which is a
  - (a) Phenolic glycoside
  - (b) Isothiocyanate glycoside
  - (c) Coumarin glycoside
  - (d) Cyanogenic glycoside
7. *Ephedra sinica* and *Ephedra equisetina* can be distinguished by type of
  - (a) Branching
  - (b) Stomata
  - (c) Scaly leaves.
  - (d) Alkaloids
8. Micropropagation of the plants is carried out through
  - (a) Cross fertilization
  - (b) Seed germination
  - (c) Plant tissue culture
  - (d) Grafting
9. Aconitine belongs to the group of
  - (a) Steroidal alkaloids
  - (b) Terpenoidal alkaloid
  - (c) Indole alkaloid
  - (d) Quinoline alkaloid
10. Crude fibre value of a drug is measure of
  - (a) Soft tissue matter
  - (b) Woody matter
  - (c) Mineral matter
  - (d) Organic matter
11. One of the units used for expressing pressure is 'torr' and is equal to
  - (a) cm of Hg
  - (b) mm of mercury
  - (c) psi
  - (d) gauge
12. Removal of a single electron from a molecule results in the formation of
  - (a) Fragment ion
  - (b) Metastable ion
  - (c) Molecular ion
  - (d) Rearrangement ion
13. Nuclear magnetic movement is NOT shown by
  - (a)  $^{13}\text{C}$
  - (b)  $^{16}\text{O}$
  - (c)  $^1\text{H}$
  - (d)  $^{15}\text{N}$
14. Derivatisation techniques in HPLC are intended to enhance
  - (a) Molecular weight
  - (b) Detectability
  - (c) Reversibility
  - (d) Reproducibility
15. A conductance cell is calibrated by using a solution of known conductivity i. e.usually a solution of
  - (a) NaCl
  - (b)  $\text{Hg}_2\text{Cl}_2$
  - (c) KCl
  - (d)  $\text{Na}_2\text{SO}_4$
16. **Metoclopramide** is generally used for
  - (a) Prophylaxis of vomiting
  - (b) Preventing motion sickness
  - (c) Treating irritable bowel syndrome
  - (d) Treatment of pancreatic insufficiency
17. DNA amplification by the polymerase chain reaction uses
  - (a) *Thermus aquaticus* DNA polymerase
  - (b) DNA topoisomerase
  - (c) RNA polymerase
  - (d) RNA helicase
18. Identify the non-pathogenic organism
  - (a) *Mycobacterium bovis*
  - (b) *Mycobacterium smegmatis*
  - (c) *Mycobacterium avium*
  - (d) *Mycobacterium intracellulare*



19. Bioassay are carried out to
- Measure the pharmacological activity of a drug
  - Avoid clinical trials for new drugs
  - Detect the impurity in a given drug
  - Screen for pharmacogenetic influences of new drugs
20. A direct way of studying idiosyncratic reactions to the given drug is by
- Changing the route of drug administration
  - Change the assay method
  - Pharmacogenomic
  - Structure activity relationship studies of a family of compounds
21. An example of haemopoietic growth factor is
- Platelet derived factor
  - Epidermal growth factor
  - Iron dextran
  - Erythropoietin
22. Safranin is used as a reagent to detect
- Gram-negative bacteria
  - Gram-positive bacteria
  - Acid fast bacteria
  - Myxozoa
23. Sulphonamides do not have adverse drug interaction with
- Oral anticoagulants
  - Sulfonylurea hypoglycemic agent
  - Hydantoin anticonvulsant
  - Dihydro folate reductase inhibitors
24. Simvastatin belongs to
- HMG CoA reductase inhibitor type of antilipidemic agents
  - HMG CoA reductase inhibitor type of anticoagulant agents
  - Fibrate type of anticoagulant agents
  - Fibrate type of antilipidemic agents
25. HIV infection can be clinically controlled with
- Cytarabine
  - Acyclovir
  - Zidovudine
  - Amantadine
26. The measure of cohesive strength of the cross linking that occurs between gelatin molecules and is proportional to the molecular weight of gelatin is so called
- Bloom Strength
  - Viscosity
  - Surface tension
  - Partition coefficient
27. A water soluble substance used as coating material in microencapsulation process is
- Polyethylene
  - Silicone
  - Hydroxy ethyl cellulose
  - Paraffin
28. One of the following is used as a solubilizing agent to solubilize testosterone in pharmaceutical liquid dosage forms.
- Sucrose monoesters
  - Lanolin esters
  - Lanoline ethers
  - Tween



29. One of the following is used as a pH dependent controlled release expicent
- (a) Carnauba wax (b) Hydroxyl propyl methyl cellulose pthalate  
(c) Methyl cellulose (d) Glyceryl monosterate
30. The Schedule in D & C Act that deals with the standards for disinfectant fluids is
- (a) Schedule B (b) Schedule F (c) Schedule O (d) Schedule M

**(Q.31-90) CARRY TWO MARK EACH**

31. The carboxyl group of aspirin is esterified with N-acetyl-p-aminophenol to get
- (a) 3-Acetamidophenyl-o-acetyl salicylate (b) 4-Acetamidophenyl-o-acetyl salicylate  
(c) O-(2-hydroxy benzoyl) salicylic acid (d) 2-Acetamidophenyl-o-acetyl salicylate
32. IUPAC system of nomenclature for **Diclophenac sodium(BP)** is
- (a) Sodium 2-[(2,6-Dichlorophenyl) amino] phenyl acetate  
(b) Sodium 3-[(2,6-Dichlorophenyl)amino] phenyl acetate  
(c) Sodium 2-[(2-Chlorophenyl) amino] phenyl acetate  
(d) Sodium 2-[(6-Chlorophenyl) amino] phenyl acetate
33. 1-(2-Aminoethyl) perhydroazocine on treatment with S-methyl isothiourea gives rise to an adrenergic neuron blocking agent
- (a) Bethanidine (b) Mecamylamine  
(c) Guanadrel (d) Guanethidine
34. **Quercetin** is
- (a) 5, 7, 3'-Trihydroxy flavones (b) 5, 7, 3', 4'-Trihydroxy flavones  
(c) 3, 5, 7, 3', 4'-Pentahydroxy flavonol (d) 3, 5, 7, 3', 4'-Pentahydroxy flavonone
35. **Meconic acid** is a chemical market for the genus
- (a) Piper (b) Pilocarpus (c) Prunus (d) Papaver
36. A novel diterpenoid isolated from the of *Taxus brevifolia* is
- (a) Demecolcine (b) Paclitaxel (c) Vinblastin (d) Brevifolicin
37. The absorption maximum for polar compound is usually shifted with change in polarity of the solvents due to
- (a) Hydrogen bonding (b) Chemical reaction  
(c) Ionization of the compound (d) Change in the chromophore
38. A titration in which potential applied across two electrode is maintained at a constant value and the current is measured and plotted against volume of titrant is
- (a) Potentiometric titration (b) Amperometric titration  
(c) Displacement titration (d) Conductometric titration
39. The parameter in the elution curve that is proportional to the concentration of a compound in gas chromatographic effluent is the
- (a) Number of peaks (b) Width of the peak  
(c) Area under the peak (d) Shape of the peak

40. A drug solution has a half life of 21 days. Assuming that the drug undergoes first order kinetics, how long will it take for the potency to drop to 90% of the initial potency
- (a) 3.2 days                      (b) 9.6 days                      (c) 16 days                      (d) 6.4 days
41. An amphoteric surfactant used in pharmaceutical disperse systems is
- (a) Bile salts                      (b) Lecithin  
(c) Sorbitan monolaurate                      (d) Sorbitan monostearate
42. An abrasive used in dentifrices is
- (a) Dicalcium phosphate                      (b) Sodium carboxy methyl cellulose  
(c) Sodium lauryl sulfate                      (d) Dioctyl sodium sulfosuccinate
43. An electrochemical method that enhances the transport of some solute molecules by creating a potential gradient through skin tissue with an applied electrical current or voltage is called
- (a) Electrophoresis                      (b) Iontophoresis                      (c) Osmosis                      (d) Implants
44. A patient with rheumatoid arthritis has been taking acetyl salicylic acid regularly. However, recently she has been experiencing stiffness, swelling and pain due to salicylate resistance. She has occult blood in her faeces. Suggest an appropriate drug suitable for her from those mentioned below
- (a) Paracetamol                      (b) Celecoxib                      (c) Piroxicam                      (d) Naproxen
45. The break down of fibrin is catalysed by
- (a) Plasmin                      (b) Renin                      (c) Urokinase                      (d) Ptylin
46. Which one of these best describes a process carried out to render a drug pharmacokinetically more acceptable <http://www.xamstudy.com>
- (a) Enteric coating of diclofenac  
(b) Co-administration of aspirin with antacids  
(c) Use of colloidal suspension or liposomes for administering Amphotericin-B  
(d) Synthesis of an analogue to obtain high receptor specificity
47. Azithromycin is clinically administered once daily as compared to erythromycin which is administered every 6 hours because, azithromycin
- (a) Penetrates into most tissue and is released very slowly  
(b) Has a methylated nitrogen in its lactone ring which renders it much more potent than Erythromycin  
(c) Is a very potent antibiotic but not tolerated well in the gastrointestinal tract  
(d) Is usually presented in a sustained release dosage
48. A patient showing muscle rigidity, bradykinesia, tremors and postural instability was administered levodopa. Which of the properties of levo-dopa is not true
- (a) Levo-dopa is preferred over dopamine because it can cross the blood brain barrier  
(b) Levo-dopa is the levorotatory stereoisomer of 3, 4-dihydroxy phenylalanine  
(c) Levo-dopa gets decarboxylated in the brain to dopamine  
(d) Levo-dopa is administered because of its strong antagonistic action on dopamine receptors

49. Autoimmunity refers to
- An automatic trigger of the immune system directed against a specific pathogen
  - Failure to distinguish between self and non-self
  - An automatic segregation of T and B cells
  - Failure of B-cells to interact with T-cells
50. Which of these is true about the discovery of HB antigen in the blood of people infected with Hepatitis-B
- It provided a basis for vaccine design
  - It indicated that specific vaccines cannot be designed for Hepatitis-B
  - It has not been of much significance
  - It indicated that Hepatitis-B is a viral disease
51. Which drug molecule does not have phenylethyl amine moiety
- Amphetamine
  - Glyburide
  - Pheniramine
  - Mescaline

*Q. 52-58 are multiple selection items. P, Q, R, S are the options. Two of these options are correct. Choose the correct combination from among the alternatives A, B, C and D.*

52. There are two methods by which the duration of action of insulin may be prolonged
- Binding with resins
  - Esterification of amino acid residues
  - Forming of complex of insulin with protein
  - Modification of particle size
- Q, R
  - R, S
  - P, S
  - P, R
53. The attributes of cycloserine are
- No tautomerism shown
  - Exists in equilibrium with its tautomeric enolic form
  - Stable in alkaline solution, destroyed rapidly at neutral or acidic pH
  - Stable in neutral solution, destroyed in alkaline pH
- R, S
  - P, Q
  - Q, R
  - P, R
54. Compared to **benzyl penicillin**, **amoxicillin** has the following advantages in biological properties
- The amino group renders the antibiotic resistant to acid catalysed degradation
  - The spectrum of activity is broadened
  - The amino group renders penicillinase resistance to the compound
  - The phenolic group renders penicillinase resistance to the compound
- P, Q
  - P, R
  - P, S
  - Q, R
55. The identification of propellants in pharmaceutical aerosols is carried out by
- Gas-chromatography
  - Tag-open cup apparatus
  - Pycnometer
  - IR Spectrophotometer
- P, Q
  - P, S
  - Q, R
  - R, S

56. Schedule 'H' and Schedule 'S' as per the Drugs & Cosmetics Act deal with the following
- (P) Prescription drugs which are required to be sold by retail only on prescription of RMP
  - (Q) Standard for cosmetics
  - (R) Biological and special products
  - (S) List of coal tar colours permitted to be used in cosmetics and soaps
- (a) P, Q                                      (b) P, R                                      (c) Q, S                                      (d) R, S

57. *Myristica fragrans* Houtt. Has two of the following characteristics
- (P) An indeciduous tree, which produces drupaceous, pale yellow fruits
  - (Q) Each fruit has several round seeds with smooth surface and lignaceous tegument, and the red fleshy aril-the mace, is present inside the seed
  - (R) A deciduous tall tree, which produces lignaceous capsules
  - (S) Each fruit has a unique ovoid seed, with lignified tegument, surrounded by orange red lacinate fleshy aril-the mace
- (a) Q, R                                      (b) P, R                                      (c) P, S                                      (d) Q, S

58. In size exclusion chromatography the stationary phases used are
- (P) Alumina                                      (Q) Dextran                                      (R) Agarose                                      (S) Styrene
- (a) P, S                                      (b) Q, R                                      (c) Q, S                                      (d) P, R

*Q. 59-65 are "Matching" exercises. Match Group I with Group II. Choose the correct combination from among the alternatives A,B,C and D.*

59. **Group I**  
**Synthetic Drug**

- (P) Buclizin
  - (Q) Chlorphenesin
  - (R) Thiotepa
  - (S) Alprazolam
- (a) P-3, Q-2, R-1, S-4  
(c) P-2, Q-4, R-3, S-1

**Group II**  
**Intermediates from which Group I drugs are synthesized**

1. Aziridin and thiophosphoryl chloride
  2. 4-Chlorophenol
  3. 4-Chlorobenzhydryl chloride
  4. 2-Amino-5-chloro benzophenone
- (b) P-4, Q-2, R-1, S-3  
(d) P-1, Q-2, R-4, S-3

60. **Group I**  
**Cardiac Agents**

- (P) Digitoxin
- (Q) Dobutamine
- (R) Sotalol
- (S) Nicardipine

**Group II**  
**Mechanism of Action**

1. Produces negative inotropic effect by blocking calcium Channels
2. Depresses adrenergically enhanced calcium influx through beta receptor blockade
3. Causes elevation of cAMP levels by stimulation of adenyate Cyclase
4. Inhibits membrane bound sodium potassium ATPase pump

(a) P-4, Q-3, R-2, S-1

(c) P-4, Q-2, R-3, S-1

61. **Group I**

**Technique employed**

(P) Visible spectrophotometry

(Q) IR spectrophotometry

(R) NMR spectrophotometry

(S) Fluorescence spectrophotometry

(a) P-2, Q-4, R-3, S-1

(c) P-3, Q-4, R-1, S-2

62. **Group I**

**Amino acids**

(P) Aspartic acid

(Q) Arginine

(R) Serine

(S) Methionine

(a) P-3, Q-2, R-4, S-1

(c) P-1, Q-2, R-3, S-4

63. **Group I**

**Tablet defects**

(P) Picking

(Q) Sticking

(R) Mottling

(S) Lamination

(a) P-1, Q-2, R-3, S-4

(c) P-2, Q-4, R-3, S-1

64. **Group I**

**Lanatosides**

(P) Lanatoside A

(Q) Lanatoside B

(R) Lanatoside C

(S) Lanatoside D

(b) P-3, Q-4, R-1, S-2

(d) P-4, Q-3, R-1, S-2

**Group II**

**Source of Radiation**

1.  $R_{\gamma}$  Source transmitter

2. Xenon lamp

3. Tungsten lamp

4. Nernst glower

(b) P-3, Q-2, R-1, S-4

(d) P-4, Q-1, R-3, S-2

**Group II**

**Common degradative products that are citric acid cycle intermediates or their precursors**

1. Succinyl CoA

2. Alpha-Ketoglutarate

3. Fumarate

4. Pyruvate

(b) P-3, Q-1, R-4, S-2

(d) P-4, Q-2, R-3, S-1

**Group II**

**Explanation**

1. A term used to describe the surface material from a tab that is sticking to and being removed from the tablet's surface by a punch

2. Term refers to tablet material adhering to the die wall

3. Term refers to an unequal distribution of colour on a tablet

4. Term refers to separation of a tablet into two or more distinct layers

(b) P-1, Q-3, R-4, S-2

(d) P-3, Q-1, R-2, S-4

**Group II**

**Aglycone**

1. Gitoxigenin

2. Diginatigenin

3. Digoxigenin

4. Digitoxigenin



(a) P-1, Q-4, R-3, S-2

(c) P-3, Q-4, R-2, S-1

65. **Group I**

**Specific chemical test**

(P) Thalleioquin Test

(Q) Murexide test

(R) Vitali-Morin test

(S) Modified Borntrager's test

(a) P-2, Q-3, R-4, S-1

(c) P-1, Q-2, R-3, S-4

(b) P-1, Q-2, R-4, S-3

(d) P-2, Q-3, R-1, S-4

**Group II**

**Phytoconstituents**

1. Hyoscyamine

2. Barbaloin

3. Quinine

4. Theobromine

(b) P-3, Q-4, R-1, S-2

(d) P-4, Q-1, R-2, S-3

*Data for Q. 66-90 are based on the statement/problem. Choose the correct answer for each question from the option A,B,C,D.*

**Data for (Q.66 - 68)**

*In a formation development laboratory a tablet is to be formulated. The core tablet has a bad taste and requires physical and chemical protection of the drug from moisture. The tablet should also deliver the drug for the local action in the intestine.*

66. Suggest a suitable method

(a) Sugar coating

(b) Film coating

(c) Enteric coating

(d) Sub coating

67. Choose the correct coating material to be used

(a) Sugar

(b) Acacia

(c) Ethyl cellulose

(d) Cellulose acetate phthalate

68. Choose the correct solvent for the coating material

(a) Acetone

(b) Water

(c) Propylene glycol

(d) Glycerin

**Data for (Q.69-70)**

*Compound A with formula  $C_2H_7N$  shows the following important bands in the IR spectra (a)  $3423cm^{-1}$ , (b)  $3236cm^{-1}$*

69. Assign these bands to the important group in the compound A

(a)  $-CH_3$

(b)  $-NH_2$

(c)  $-CN$

(d)  $=C=N-$

70. On treatment with nitrous acid the compound A is converted to B, which shows a strong band at  $3430cm^{-1}$ . Assign the absorption band for the group formed in the product

(a)  $-OH$

(b)  $=C=N-$

(c)  $-COOH$

(d)  $-N=N-$

**Data for (Q.71-73)**

*In the assay of sulfamethoxazole I.P ( $C_{10}H_{11}N_3O_3S$ ), 0.2g of the sample was dissolved in 50ml of 2M HCl. To this was added 3g of KBr and the titration was carried out.*

71. Titration was carried out using

(a)  $NaNO_2$  to estimate the amino group

(b)  $NaNO_2$  to estimate the sulphonamido group

(c)  $NaOH$  to estimate the amino group

(d)  $NaOH$  to estimate the sulphonamido group



72. The end point in the assay was determined by

- (a) Conductometric method (b) Using an indicator  
(c) Potentiometric method (d) Photometric method

73. If the volume of 0.1 M titrant consumed was 7.8 ml calculate the % purity of the sample

- (a) 99.70% (b) 9.97% (c) 8.87% (d) 98.79%

### Data for (Q.74-75)

*A drug which is unstable to light, susceptible to oxygen and gets degraded in presence of metallic ions, has to be formulated in the form of a solution for injection.*

74. Choose a suitable additive to improve the stability of the injection

- (a) Preservative (b) Chelating agent (c) Buffer (d) Tonicity contributor

75. Select the appropriate filling and method for the above product

- (a) Filling in an amber colored ampoule with an addition of antioxidant, replacing the inside air with nitrogen and sealing <http://www.xamstudy.com>  
(b) Filling with an antioxidant dissolved in the solution and sealing the ampoule  
(c) Filling in an amber colored ampoule with a preservative and sealing  
(d) Filling in an ampoule, sealing and giving direction to store it in dark

### Data for (Q.76-77)

*The usual adulterants for buds are clove stalks and anthophyll*

76. Clove stalks can be identified by the presence of

- (a) Starch grains (b) Cystoliths  
(c) Lignified sclereids (d) Acicular crystals of calcium oxalate

77. Anthophylli can be identified by the presence of

- (a) Lignified sclereids (b) Acicular crystals of calcium oxalate  
(c) Cystoliths (d) Starch grains

### Data (Q. 78-80)

*Plant tissue culture of carrot is being developed in the laboratory on a semisolid White's medium.*

78. The micronutrient essential in the medium is

- (a) NaCl (b)  $\text{CoCl}_2$  (c) KCl (d)  $\text{CaCl}_2$

79. The pH of the medium is

- (a) 6.6 (b) 6.0 (c) 5.6 (d) 5.0

80. The tissue growth observed is

- (a) Undifferentiated cells suspended in the medium  
(b) Undifferentiated cells in clusters distributed in the medium  
(c) Differentiated mass of cells  
(d) Surface growth of undifferentiated mass of cells

### Data for (Q. 81-82)

*In glucose metabolism, name the enzymes catalyzing the following step.*

81. Conversion of glucose to glucose-6-phosphate

- |                            |                                       |
|----------------------------|---------------------------------------|
| (a) Hexokinase             | (b) Glucose-6-phosphate dehydrogenase |
| (c) Glycogen phosphorylase | (d) Glycogen synthase                 |

82. Conversion of 2-phosphoglycerate to phosphoenol pyruvate

- |                             |                             |
|-----------------------------|-----------------------------|
| (a) Pyruvate kinase         | (b) Phosphoglycerate mutase |
| (c) Phosphoglycerate kinase | (d) Enolase                 |

### Data for (Q. 83-84)

*Methotrexate, trimethoprim and pyrimethamine are all known to be inhibitors of dihydrofolate reductase. Yet they are classified in different therapeutic categories*

83. Trimethoprim has an advantage over methotrexate in its therapeutic category because

- (a) Trimethoprim binds to bacterial DHFR about 50,000 times more strongly as compared to the host DHFR
- (b) Trimethoprim can be administered orally
- (c) Trimethoprim exhibits no significant adverse effects
- (d) Trimethoprim has additional anti-inflammatory properties

84. Methotrexate is thought to exert its actions by

- |  |  |
|--|--|
| (a) Interfering with purine synthesis      | (b) Intracellular formation of an amine adduct |
| (c) Forming a conjugate with nucleic acids | (d) Inhibiting the synthesis of folic acid     |

### Data for (Q. 85-87)

*An administrative officer having high blood pressure, gastric acidity and diabetes is prescribed famotidine, enalapril and tolbutamide.*

85. From the structural features of the drugs, predict which will be ionized in the stomach

- |                 |                               |
|-----------------|-------------------------------|
| (a) Famotidine  | (b) Enalapril                 |
| (c) Tolbutamide | (d) Enalapril and tolbutamide |

86. The patient cannot tolerate enalapril. Which of the following can be substituted?

- |                   |                |
|-------------------|----------------|
| (a) Omeprazole    | (b) Losartan   |
| (c) Rosiglitazone | (d) Clofibrate |

87. Famotidine acts as

- |  |  |
|--|--|
| (a) H <sub>1</sub> -histamine antagonist | (b) H <sub>2</sub> -histamine antagonist |
| (c) Proton pump inhibitor                | (d) H <sub>1</sub> agonist               |

### Data for (Q. 88-90)

*2-Methoxy naphthalene on treatment with acetyl chloride in presence of AlCl<sub>3</sub> gives 2-acetyl-6-methoxy naphthalene. This is converted with a set of reagents-X to 6-methoxy-2-naphthyl acetic acid, which is esterified with methanol to the methyl ester. Ester on treatment with Y gives DL-2-(6-methoxy-2-naphthyl)-propionic acid methyl ester. This on hydrolysis gives Z (final compound)*

88. The set of reagents- X are

- (a) Morpholine /Sulphur followed by  $H_2SO_4/H_2O$  (b) Morphine/Sulphur followed by  $HCl/H_2O$   
(c) Formic acid/Cu followed by acetic acid (d) Hydroiodic acid followed by  $H_2SO_4/H_2O$

89. Identify the reagents -Y

- (a)  $NaOH/CH_3OH$  (b)  $NaH/CH_3I$   
(c) Hydrazine/ $CH_3I$  (d)  $LiAlH_4/CH_3OH$

90. The final compound Z is

- (a) Naphazoline (b) Carprofen (c) Pranoprofen (d) Naproxen

**End of paper**

**ANSWER KEY GATE 2004**

1 - a	2 - c	3 - d	4 - c	5 - b	6 - d
7 - b	8 - c	9 - b	10 - c	11 - b	12 - c
13 - b	14 - b	15 - c	16 - a	17 - b	18 - a
19 - a	20 - c	21 - c	22 - a	23 - d	24 - a
25 - c	26 - a	27 - c	28 - d	29 - b	30 - c
31 - b	32 - a	33 - d	34 - b	35 - d	36 - b
37 - c	38 - b	39 - b	40 - a	41 - b	42 - a
43 - b	44 - b	45 - a	46 - c	47 - a	48 - d
49 - b	50 - a	51 - b	52 - a	53 - c	54 - a
55 - b	56 - a	57 - b	58 - b	59 - a	60 - a
61 - c	62 - a	63 - a	64 - c	65 - b	66 - c
67 - d	68 - c	69 - b	70 - a	71 - a	72 - c
73 - a	74 - b	75 - a	76 - c	77 - d	78 - b
79 - c	80 - b	81 - a	82 - d	83 - a	84 - d
85 - a	86 - b	87 - b	88 - a	89 - b	90 - d

# GPAT QUESTION PAPER 2003 WITH ANSWER KEY

## PHARMACEUTICAL SCIENCE

**Time : 3 hours**

**Maximum Marks : 150**

**Read the following instruction carefully.**

- This question paper contains 90 objective questions. Q. 1-30 carry 1 mark each and Q. 31-90 carry two marks each.*
- Answer all the questions.*
- Questions must be answered on special machine gradable Objective Response Sheet (ORS) by darkening the appropriate bubble (marked A, B, C, D) using HB pencil against the question number on the left hand side of the ORS. Each question has only one correct answer. In case you wish to change an answer, erase the old answer completely using a good soft eraser.*
- There will be NEGATIVE marking. For each wrong answer, 0.25 mark for Q. 1-30 and 0.5 mark for Q. 31-90 will be deducted. More than one answer marked against a question will be deemed as an incorrect response and will be negative marked.*
- Write your registration number, name and name of the Centre at the specified locations on the right half of the ORS.*
- Using HB pencil, darken the appropriate bubble under each digit of your registration number.*
- Using HB pencil, darken the appropriate bubble under the letters corresponding to your paper code.*
- No charts or tables are provided in the examination hall.*
- Use the blank pages given at the end of the question paper for rough work.*
- This question paper contains 20 pages. Please report, if there is any discrepancy.*

### **(Q. 1 - 30) CARRY ONE MARK EACH**

- Cokchicine is biogenetically derived from one of the following**
  - Tyrosine and Phenylalanine
  - Tryptophan and phenylalanine
  - Ornithine and Tryptophan
  - Ornithine and phenylalanine
- The diagnostic character for the microscopically identification of Kurchi bark is**
  - Fibers with Y-shaped pits
  - Horse shoe shaped stone cells
  - Steroids containing calcium oxalate crystals
  - Stratified cork
- It is possible to initiate the development of complete plants from callus cell cultures by suitable manipulation of the medium with respect to**
  - Minerals
  - Vitamins
  - Carbohydrates
  - Hormones
- Polyploidy is defined as**
  - Addition of one chromosome
  - Multiplication of entire chromosome set
  - Submicroscopic change in DNA material
  - Gross structural change

6. Simplification of Morphinan system gave one BENZOMORPHAN derivative
- (a) Pentazocin (b) Pethidine  
(c) Levorphanol (d) Buprenorphine
7. A metabolite of SPIRONOLACTONE is
- (a) Aldosterone (b) Canrenone  
(c) Corticosterone (d) Pregnenolone
8. The IUPAC name for NAPROXEN is
- (a) (S)-2-(6-ethoxy-2-naphthyl)-acetic acid (b) (S)-2-(6-methoxy-2-naphthyl)-acetic acid  
(c) (S)-2-(6-ethoxy-2-naphthyl)-propionic acid (d) (S)-2-(6-methoxy-2-naphthyl)-propionic acid
9. The metabolic function of Riboflavin involves the following
- (a) FMN and FAD (b) NADP and NADPH  
(c) AMP and ATP (d) Retin and Retinine
10. X-ray spectral lines K $\alpha$  doublet arises from transition of electrons from
- (a) M shell to K shell (b) L shell to K shell  
(c) L shell to M shell (d) M shell to K shell
11. The method of expressing magnetic field strength
- (a) Cycles/sec (b) Pulses/sec (c) Debye units (d) Gauss
12. A solvent used in NMR
- (a) Chloroform (b) Acetone  
(c) Carbon tetrachloride (d) Methanol
13. A widely accepted detector electrode for pH measurement is
- (a) Platinum wire (b) Glass electrode  
(c) Ag-AgCl electrode (d) Lanthanum fluoride
14. Commercial production of citric acid is carried out by the microbial culture of
- (a) *Fusarium moniliformi* (b) *Rhizopus nigrican*  
(c) *Aspergillus Niger* (d) *Candida utilis*
15. For thermophilic micro-organisms, the minimum growth temperature required is
- (a) 20°C (b) 37°C (c) 45°C (d) 65°C
16. Obligatory anaerobes
- (a) Can tolerate oxygen and grow better in its presence  
(b) Do not tolerate oxygen and die in its presence  
(c) Can grow in oxygen levels below normal  
(d) Can grow in presence of atmospheric oxygen
17. Plasmid is a
- (a) Macromolecule involved in the protein synthesis  
(b) Circular piece of duplex DNA  
(c) A hybrid DNA that is formed by joining pieces of DNA  
(d) Endogenous substances secreted by one type of cell



18. Lactose intolerance is because of the lack of  
 (a) Acid phosphates (b) Lactate dehydrogenase  
 (c) Galactose-1-phosphate-uridyl transferase (d) Amylase
19. Synthesis of UREA takes place exclusive in  
 (a) Kidney (b) Liver  
 (c) Gall bladder (d) Urinary bladder
20. A term which describes a cofactor that is finally bound to an enzyme  
 (a) Holoenzyme (b) Prosthetic  
 (c) Coenzyme (d) Transferase
21. How many parts of 10 % ointment be mixed with 2 parts of 15 % ointment to get 12% ointment  
 (a) 2 (b) 3 (c) 5 (d) 6
22. The correct non-ionic surfactant used as a penetration enhancer in the preparation of mucoadhesives  
 (a) Oleic acid (b) Tween-80  
 (c) Glycerol (d) Propylene glycol
23. One of the ex-officio member of the Pharmacy Council of India is  
 (a) Director General of Health Services (b) Government Analyst  
 (c) Registrar of the State Pharmacy Council (d) Director General of veterinary Research Institute
24. The Schedule in Drugs and Cosmetics Act that deals with the requirements and guidelines for clinical trials, import and manufacture of new drugs is  
 (a) Schedule 'O' (b) Schedule 'M' (c) Schedule 'F' (d) Schedule 'Y'
25. A retardant material that forms a hydrophilic matrix in the formulation of matrix tablets is  
 (a) H.P.M.C (b) C.A.P (c) Polyethylene (d) Carnauba wax
26. A drug which causes pink to brownish skin pigmentation within a weeks of the initiation of the therapy is  
 (a) Itraconazole (b) Clofazimine (c) Lomefloxacin (d) Neomycin
27. The risk of Digitalis toxicity is significantly increased by concomitant administration of  
 (a) Triamterene (b) Lidocaine  
 (c) Captopril (d) Hydrochlorothiazide
28. An agent used in Prinzmetal angina has spasmolytic action which increases coronary blood supply is  
 (a) Nitroglycerine (b) Nifedipine  
 (c) Timolol (d) Isosorbide mononitrate
29. An organism which has been implicated as a possible cause of chronic gastritis and peptic ulcer is  
 (a) *Campylobacter jejuni* (b) *Escherichia coli*  
 (c) *Helicobacter pylori* (d) *Giardia lamblia*
30. A 5HT<sub>1D</sub> receptor agonist useful in migraine is  
 (a) Sumatriptan (b) Ketanserin (c) Ergotamine (d) Methysergide



**(Q.31-90) CARRY TWO MARK EACH**

31. At present, different species of *Papaver* such as *P. Orientale* are being cultivated instead of *P. somniferum* because they contain
- (a) More of morphine    (b) Less of morphine    (c) Only codeine    (d) Only thebaine
32. Guggulipid, a resin is
- (a) A hypolipidemic agent obtained from cotton plants containing multifunctional compound ( $\pm$ ) Gossypol  
(b) A lipid obtained from *Arctium lappa*, Asteraceae traditionally used for the treatment of dermatoses  
(c) Cathartic glucosin obtained from *Ipomoea orizabensis* and used since ancient time  
(d) A hypolipidemic agent obtained from *Commiphora mukul* consisting of mixture of sterols including Z-pregna-(20)-diene-3, 16-diene
33. In nitrofuantion synthesis, 5-nitrofurfuraldehyde diacetate is treated with one of the following intermediate in presence of  $\text{CH}_2\text{COOH} + \text{H}_2\text{SO}_4 + \text{C}_2\text{H}_5\text{OH}$
- (a) Hydantoin    (b) 1-5-diamino hydantoin  
(c) 1-3-diamino hydantoin    (d) 1-amino-hydantoin
34. 4-hydroxy-3-hydroxymethyl benzaldehyde is treated with acetic anhydride and then kept with other solvent, t-butyl cyanide and acetic acid for ten days. Resulting compound is reduced with  $\text{LiAlH}_4$  in tetra hydrofuran. The final product is
- (a) Isoprenaline    (b) Dobutamine    (c) Salbutamol    (d) Orciprenaline
35. 2-iminothiazolidine is treated with phenyl oxirane to get a drug used in roundworm infection
- (a) Piperazine    (b) Tetramisole    (c) Thiabendazole    (d) Levamisole
36. Thiamine hydrochloride on treatment with alkaline potassium ferricyanide gives
- (a) Thymochrome with fluorescence    (b) Oxythiamine with golden yellow color  
(c) Neopyrithiamine with orange yellow color    (d) Thiochrome with blue fluorescence
37. A new drug delivery system which is composed of phospholipids that spontaneously form a multiamellar, concentric bilayer vesicles with layers of aqueous media separating the lipid layers is
- (a) Prodrugs    (b) Liposomes    (c) Osmotic pumps    (d) Nanoparticles
38. Unless otherwise stated in the individual monograph of the pharmacopeia, in the disintegration test for enteric coated tablets, first the dissolution is carried out in <http://www.xamstudy.com>
- (a) 0.1 M HCl    (b) Phosphate buffer    (c) Water    (d) 0.1 M  $\text{H}_2\text{SO}_4$
39. What is the proportion of NaCl required to render a 1.5% solution of drug isotonic with blood plasma? The freezing point of 1% w/v solution of drug is  $-0.122^\circ\text{C}$  and that of NaCl is  $-0.576^\circ\text{C}$
- (a) 0.65%    (b) 0.585%    (c) 0.9%    (d) 0.5%
40. IR Spectra appear as dips in the curve rather than maxima as in UV-Visible spectra because it is a plot of
- (a) % Absorbance against wave no.    (b) % Transmittance against concentration  
(c) % Absorbance against Concentration    (d) % Transmittance against wave no
41. ESR is applied to only those substances showing para magnetism which is due to the magnetic moments of
- (a) Neutrons    (b) Protons    (c) Paired electrons    (d) Unpaired electron

42. Rotation of electrons about the proton generates a secondary magnetic field which may oppose the applied magnetic field. The proton is then said to be
- (a) Shielded                      (b) Shifted                      (c) Hydrogen                      (d) Deshielded
43. The analyte is used in the form of a solution flame photometry because it should undergo
- (a) Evaporation                      (b) Condensation                      (c) Nebulization                      (d) Precipitation
44. The mechanism of antiparasitic action of Mebendazole and thiabendazole involves
- (a) Stimulation of acetylcholine receptors at neuromuscular junctions  
(b) Inhibition of dihydropolate reductase  
(c) Interference with microtubule synthesis and assembly  
(d) Block thiamine transport
45. Isoniazid is a primary anti-tubercular agent that
- (a) Requires pyridoxine supplementation  
(b) Causes ocular complication that are reversible if the drug is discontinued  
(c) Is ototoxic and nephrotoxic  
(d) Should never be used due to its hepatotoxicity potential
46. Decreased risk of Atherosclerosis is associated with increase in
- (a) Very-low-density lipoproteins                      (b) Low-density lipoproteins  
(c) Cholesterol                      (d) High-density lipoproteins
47. The mechanism of action of Paclitaxel is
- (a) Bind to DNA through intercalation between specific bases and block the synthesis of new RNA or DNA, cause DNA strand scission  
(b) Mitotic spindle poison through the enhancement of tubulin polymerization  
(c) Competitive partial agonist-inhibitor of estrogen and binds to estrogen receptors  
(d) S-Phase specific antimetabolite that is converted by deoxy kinase to the 5'-mononucleotide
48. Lycopodium spore method can be used to find out percentage purity of crude drug which contain
- (a) Multi-layered tissues or cells  
(b) Well defined particles which can be counted  
(c) Oil globules  
(d) Characteristic particles of irregular thickness the length of which can measured
49. The microscopical character flower buds of *Eugenia caryophyllus* is
- (a) Collenchymatous parenchyma containing in its outer part numerous ellipsoidal schizolysigenous oil glands  
(b) Small translucent endosperm containing aleurone grains  
(c) Wide parenchymatous starchy cortex, the endosperm containing volatile oil  
(d) Outer surface consisting of external perisperm, rough, dark brown with reticulate furrows

50. In protein biosynthesis, each amino acid

- (a) Recognises its own codon by a direct interaction with the m-RNA template
- (b) Is added in its proper place to a growing peptide chain through "adaptor" function of t-RNA
- (c) Is first attached to an anti codon specific for the amino acid
- (d) Undergoes fidelity translation which is assured by the presence of traces of DNA on the ribosome

51. Rabies Antiserum I. P. is

- (a) A freeze dried preparation containing antitoxic
- (b) A preparation containing specific globulin or its derivatives obtained by purification of hyper immune serum or plasma of healthy horses
- (c) A sterile preparation containing antitoxic globulin
- (d) A sterile preparation containing antioxic globulin obtained by purification of hyper immune serum of horses

*Q. 52-58 are multiple selection items. P, Q, R, S are the options. Two of these options are correct. Choose the correct combination from among the alternatives A, B, C and D.*

52. Total ash value in case of crude drug signifies

- (P) Organic content of the drug
- (Q) Mineral matter in the drug
- (R) Addition of extraneous matter such as sand stone etc
- (S) Woody matters present in the drug

- (a) R, S
- (b) Q, R
- (c) P, Q
- (d) P, S

53. The compounds listed below contain  $\alpha$ ,  $\beta$  and  $\eta$  electrons

- (P) Acetaldehyde
- (Q) Butadiene
- (R) Formaldehyde
- (S) Benzene

- (a) R,S
- (b) Q,R
- (c) P,R
- (d) P,S

54. A 60 year old patient presents with glaucoma. Therapy should include

- (P) Topical atropine
- (Q) Topical pilocarpine
- (R) Oral acetazolamide
- (S) Oral pilocarpine

- (a) P,Q
- (b) Q,R
- (c) R,S
- (d) P,S

55. Measurement of particle size in pharmaceutical Aerosols is by

- (P) Cascade impactor
- (Q) Light scatter decay
- (R) Karl-Fischer method
- (S) IR spectrophotometry

- (a) P,Q
- (b) Q,R
- (c) R,S
- (d) P,S

56. The common attributes of ascorbic acid, an antiscorbutic vitamin, are

- (P) Exist in nature in both reduced and oxidized form and in a state of reversible equilibrium
- (Q) Has keto-enol system in the molecule
- (R) Has an aldehyde group since it gives positive Schiff's reaction
- (S) Salt forming properties are due to the presence of the free carboxyl group

- (a) P,R
- (b) Q,R
- (c) R,S
- (d) Q,S

57. Two properties of Radiopharmaceuticals are

- (P) Slow localization in target issue
  - (Q) Very long half-life to minimize radiation exposure yet long enough to get imaging information
  - (R) Short half-life to minimize radiation exposure yet long enough to get imaging information
  - (S) Rapid localization in target tissue and quick clearance from non-target organs
- (a) P,Q                      (b) Q,R                      (c) R,S                      (d) P,S

58. Two correct statements concerning vitamin D are

- (P) The active molecule 1,25-dihydroxy cholecalciferol binds to intracellular receptor proteins
  - (Q) Cholecalciferol is found in vegetables
  - (R) 1,25-dihydroxy-D<sub>3</sub> is the potent vitamin D metabolite
  - (S) It is required in the diet of individuals exposed to sunlight
- (a) P,S                      (b) P,R                      (c) R,S                      (d) P,Q

*Q. 59-65 are "Matching" exercises. Match Group I with Group II. Choose the correct combination from among the alternatives A,B,C and D.*

59. Group I (Tablet Additives)

- (P) Binder
  - (Q) Insoluble lubricant
  - (R) Film coating material
  - (S) Direct compression diluents
- (a) 2-P, Q-1, 3-R, 4-S  
(c) 4-P, 3-Q, 2-R, 1-S

Group II (Examples)

1. Acacia
  2. Light mineral oil
  3. Hydroxy ethyl cellulose
  4. Microcrystalline cellulose
- (b) 3-P, 2-Q, 1-R, 4-S  
(d) 1-P, 4-Q, 3-R, 2-S

60. Group I (IR Detectors)

- (P) Thermocouple
  - (Q) Pyroelectric Detector
  - (R) Golay cells
  - (S) Thermistor
- (a) P-4, Q-2, R-3, S-1  
(c) P-1, Q-3, R-2, S-4

Group II (Composition)

1. Oxides of Mn, Co and Ni
  2. Bi-Sb
  3. Xenon
  4. Triglycine sulphate
- (b) P-3, Q-1, R-4, S-2  
(d) P-2, Q-4, R-3, S-1

61. Group I (Alkaloid)

- (P) Coniine
  - (Q) Papaverine
  - (R) Anabasine
  - (S) Reserpine
- (a) P-2, Q-3, R-1, S-4  
(c) P-4, Q-1, R-2, S-3

Group II (Ring system)

1. Isoquinoline
  2. Pyridine-Piperidine
  3. Yohimbane
  4. Piperidine
- (b) P-4, Q-3, R-2, S-1  
(d) P-2, Q-4, R-3, S-1

62. Group I (Immunoglobulins[Ig])

- (P) IgG
- (Q) IgA
- (R) IgM
- (S) IgE
- (a) P-4, Q-3, R-2, S-1
- (c) P-2, Q-3, R-4, S-1

63. Group I (Antibiotics)

- (P) Streptomycin
- (Q) Erythromycin
- (R) Gentamycin
- (S) Tetracycline
- (a) P-4, Q-3, R-1, S-2
- (c) P-3, Q-2, R-3, S-4

64. Group I (Synthetic estrogenic drug)

(P) Ethinyl Estradiol

(Q) Dienoestrol

(R) Chlorotrainisine

(S) Stilboestrol

- (a) P-4, Q-3, R-1, S-2
- (c) P-1, Q-4, R-2, S-3

65. Group I (Immunosuppressants)

(P) Azathioprine  
(Q) Tacrolimus

(R) Glucocorticoids

(S) Cyclophosphamide

- (a) P-3, Q-2, R-1, S-4
- (c) P-2, Q-1, R-3, S-4

Group II (Actions)

1. Agglutination and cytolysis
  2. Antiallergic
  3. Neutralises toxins
  4. Antimicrobial
- (b) P-3, Q-4, R-1, S-2
  - (d) P-2, Q-1, R-4, S-3

Group II (Microorganism used in the I.P. assay)

1. Bacillus cereus
  2. Staphylococcus
  3. Klebsiella pneumoniae
  4. Micrococcus luteus
- (b) P-3, Q-4, R-2, S-1
  - (d) P-3, Q-4, R-1, S-2

Group II (Methods of synthesis)

1. 4',4'-Dimethoxy of benzophenone is treated with 4-methoxy benzoyl chloride + Mg, resulting product is treated with PPTS followed by  $\text{Cl}_2 + \text{CCl}_4$
  2. Deoxy anisoin is alkylated and product subjected to Grignard reaction, the resulting tertiary alcohol is dehydrated and demethylated with alcoholic KOH
  3. By pinacol reduction of p-hydroxy propiophenone and subsequent removal of water
  4. From Estrone by the action of Potassium acetylide
- (b) P-4, Q-1, R-3, S-2
  - (d) P-3, Q-1, R-4, S-2

Group II (Mechanism of action)

1. Destroys proliferating lymphoid cells
  2. Prodrug transformed to mercaptopurine which on further conversion inhibits purine metabolism
  3. Inhibits the cytoplasmic phosphatase Calcineurin
  4. Interferes with the cell cycle of activated lymphoid cells
- (b) P-2, Q-3, R-4, S-1
  - (d) P-4, Q-3, R-2, S-1



Data for Q. 66-90 are based on the statement/problem. Choose the correct answer for each question from the option A,B,C,D.

### Data for (Q.66 - 68)

Leaves of *Digitalis Purpurea* were subjected to morphological, microscopical and chemical screening

66. Morphological character with respect to the leaf is

- |   |   |
|---|---|
| (a) Ovate lanceolate with entire margin   | (b) Ovate lanceolate with crenate margin  |
| (c) Linear lanceolate with serrate margin | (d) Linear lanceolate with sinuate margin |

67. Morphological character with respect to the leaf is

- |   |   |
|---|---|
| (a) Ovate lanceolate with entire margin   | (b) Ovate lanceolate with crenate margin  |
| (c) Linear lanceolate with serrate margin | (d) Linear lanceolate with sinuate margin |

68. The drug gives positive

- |                       |                    |
|-----------------------|--------------------|
| (a) Borntrager's test | (b) Murexide test  |
| (c) Legal's test      | (d) Thakoquin test |

### Data for (Q.69-70)

In a synthetic procedure -chloro-2,4 diamino sulfonyl aniline is treated with P to obtain 7-amino sulfonyl 6-chloro-3-chloro-methyl-2H-1,2,4-benzothiadiazin-1:1 dioxide. Subsequently it is refluxed with  $C_6H_5-CH_2-SH+NaOH+DMF$  to yield Y

69. Select the reagent P

- |                        |                  |
|------------------------|------------------|
| (a) Chloroacetyldehyde | (b) Formaldehyde |
| (c) Formic acid        | (d) Acetaldehyde |

70. The final product Y is

- |   |
|---|
| (a) 3-benzyl methyl-6-chloro-2H-1, 2, 4-benzothiadiazine-7-sulphonamide-1, 1-dioxide    |
| (b) 3-benzyl thiomethyl-6-chloro-2H-1, 2, 4-benzothiadiazine-7-sulphonamide1, 1-dioxide |
| (c) 3-benzyl thiomethyl-5-chloro-2H-1, 2, 3-benzothiadiazine-7-sulphonamide1, 1-dioxide |
| (d) 3-benzyl thiomethyl-6-chloro-2H-1, 2, 4-benzothiadiazine-7-sulphonamide1, 1-dioxide |

### Data for (Q.71-73)

Proguanil is synthesized by diazotization of p-chloroaniline and treating with dicyanamide to yield p-chlorophenyl dicyandiamide which is converted to proguanil by reaction with an aliphatic amine. Proguanil is metabolized to a triazine derivative which is an active metabolite.

71. What is the reagent used for diazotization

- |                                   |                                      |
|-----------------------------------|--------------------------------------|
| (a) $NaNO_2 + \text{dilute HCl}$  | (b) $KNO_3 + \text{dilute } H_2SO_4$ |
| (c) $Zn + \text{dilute } H_2SO_4$ | (d) Tin + $H_2SO_4$                  |

72. Name the aliphatic amine used

- |                   |                    |
|-------------------|--------------------|
| (a) Dimethylamine | (b) Isopropylamine |
| (c) Isobutylamine | (d) Diethylamine   |



73. Name the metabolite

- (a) Thioguanil (b) Diguamil  
(c) Cycloguanil (d) P-chlorophenyl biguanide

**Data for (Q.74-76)**

*Calculate the  $\lambda$  max for the following compounds. Base value for Benzaldehyde in ethanol is 250nm.*

74.  $\lambda$  max of p-bromobenzaldehyde in nm is

- (a) 265 (b) 255 (c) 275 (d) 260

75.  $\lambda$  max of p-hydroxy benzaldehyde in nm is

- (a) 253 (b) 275 (c) 261 (d) 270

76.  $\lambda$  max of o-chlorobenzaldehyde in nm is

- (a) 275 (b) 265 (c) 255 (d) 250

**Data for (Q.77-78)**

*In the assay of Folic acid I.P., a weighed quantity is dissolved in 0.1 M NaOH solution and subsequently treated with Zn and HCl. The resulting product is mixed with ammonium sulphate, kept for 2 minutes and a reagent is added to get final colored product whose absorbance is measured.*

77. Select the product obtained when folic acid is heated with Zn + HCl

- (a) Benzoic acid (b) P-aminobenzoic (c) Glutamic (d) Succinic acid

78. Select the reagent used for the development of color

- (a) N-1-naphthyl ethylene diamine dihydrochloride (b) Ninhydrin reagent  
(c) P-dimethyl amino benzaldehyde (d) Phloroglucinol

**Data for (Q.79-80)**

*Parkinsonism is a common neurological movement disorder. Signs include rigidity of skeletal muscle, akinesia, flat faces and tremors at rest. Both L-DOPA and carbidopa are used.*

79. Carbidopa is used because

- (a) It crosses blood brain barrier  
(b) It inhibits aromatic L-amino acid decarboxylase  
(c) It inhibits MAO type A  
(d) It inhibits MAO type B

80. Select the specific unwanted effect of L-DOPA

- (a) Dementia (b) Hypertension (c) Dyskinesia (d) Excitotoxicity

**Data for (Q.81-82)**

*The decomposition of a drug in aqueous acid solution was found to follow first order reaction. The initial concentration was found to be 0.056 M. The concentration after a period of 12 hours was  $4.10 \times 10^{-2}$  moles/liter. The reaction rate constant is  $0.02599 \text{ hr}^{-1}$ .*

81. What is the quantity of drug remaining undecomposed after 8 hours.
- (a) 0.455 moles/liter (b) 0.25 moles/liter  
 (c) 0.0455 moles/liter (d) 0.10 moles/liter
82. What is the amount of drug deteriorated during the period of 24 hours.
- (a) 0.026 moles/liter (b) 0.0026 moles/liter  
 (c) 0.03 moles/liter (d) 0.053 moles/liter

### Data for (Q.83-85)

*In a formulation development laboratory, you have to formulate an oral dosage form containing olive oil, Vitamin A and water.*

83. Suggest a suitable dosage form
- (a) Solution (b) Suspension (c) Emulsion (d) Capsule
84. Suggest a substance to be incorporated into the formulation
- (a) Glycerin (b) Acacia (c) Cetrimide (d) Alcohol
85. Select one of the appropriate labeling directions
- (a) Keep in the refrigerator (b) No-preservatives  
 (c) Schedule 'G' (d) Shake well before use

### Data for (Q.86-87)

*Successive solvent extraction of a crude drug with petroleum ether, benzene, chloroform, ethyl alcohol and water performed. Qualitative chemical testing of petroleum ether extract gave positive keller-killani and salkowski's reaction. Ethyl alcohol and aqueous extract gave positive  $FeCl_3$  reaction and aqueous extract gave foamy solution.* <http://www.xamstudy.com>

86. What constituents are present in the petroleum ether/benzene extract?
- (a) Plant sterols (b) Tropane alkaloids  
 (c) Sesquiterpenoids (d) Purines
87. What constituents are present in the ethyl alcohol and aqueous extracts?
- (a) Plant lipids (b) Anthraquinone glycosides  
 (c) Alkaloids (d) Plant phenols and saponins

### Data for (Q.88-90)

*A business executive while playing tennis complained of chest pain and was brought to emergency room. He has history of mild hypertension and elevated blood cholesterol. ECG changes confirmed the diagnosis of myocardial infarction. The decision is made to open his occluded artery by using thrombolytic agent and also use aspirin later.*

88. The thrombolytic agent used is
- (a) Heparin (b) Warfarin (c) Anistreptase (d) Vit K

89. Mechanism of action of aspirin is

- (a) Inhibit vitamin K absorption (b) Antithrombin activity  
(c) Inhibit metabolism of heparin (d) Inhibit platelet aggregation

90. Mechanism of action of antithrombotic agent is

- (a) Conversion of plasminogen to plasmin (b) Activation of clotting factors  
(c) Inhibit platelet aggregation (d) Agonist of vitamin K

**End of paper**

**ANSWER KEY GATE 2003**

1 - a	2 - b	3 - d	4 - b	5 - b	6 - a
7 - b	8 - d	9 - a	10 - b	11 - d	12 - c
13 - c	14 - c	15 - d	16 - b	17 - c	18 - b
19 - b	20 - c	21 - b	22 - d	23 - a	24 - d
25 - a	26 - b	27 - d	28 - d	29 - c	30 - a
31 - d	32 - d	33 - d	34 - c	35 - a	36 - a
37 - b	38 - a	39 - c	40 - d	41 - d	42 - a
43 - c	44 - c	45 - a	46 - d	47 - b	48 - b
49 - a	50 - b	51 - b	52 - b	53 - c	54 - b
55 - a	56 - d	57 - c	58 - c	59 - d	60 - d
61 - c	62 - b	63 - b	64 - a	65 - b	66 - b
67 - c	68 - c	69 - a	70 - a	71 - a	72 - b
73 - c	74 - c	75 - a	76 - b	77 - c	78 - b
79 - b	80 - c	81 - c	82 - a	83 - c	84 - b
85 - d	86 - a	87 - d	88 - c	89 - d	90 - a

# GPAT QUESTION PAPER 2002 WITH ANSWER KEY

## PHARMACEUTICAL SCIENCE

Time : 3 hours

Maximum Marks : 200

Read the following instruction carefully.

1. All answer must be written in ENGLISH.
2. This question paper consists of TWO SECTIONS : Section 'A' and 'B'.
3. Section A consists of two questions of the multiple choice type. Question 1 consists of TWENTY FIVE sub-questions of ONE mark each and Questions 2 consists of TWENTY FIVE sub-question of TWO marks each.
4. Answer Section A only on the special machine-gradable OBJECTIVE RESPONSE SHEET (ORS). Questions in Section A will not be graded if answered elsewhere.
5. Write your name, registration number and the name of the center at the specified locations on the right half of the ORS for Section A .
6. Using a HB pencil, darken the appropriate bubble under each digit of your registration number. .
7. Questions in Section A are to be answered by darkening the appropriate bubble (marked A, B, C or D) using a HB pencil against the question number on the left hand side of the ORS. In case, you wish to change an answer, erase the old answer completely using a good sort eraser.
8. The ORS will be collected after 120 minutes from the start of the examination. In case you finish Section A before the expiry of 120 minutes, you may start answering Section B.
9. There will be NEGATIVE marking in Section A. for each wrong answer to 1-and 2- mark sub-questions, 0.25 and 0.5 marks will be deducted respectively. More than one answer marked against a question will be deemed as an incorrect response and will be negatively marked.
10. Answer questions in Section B in the answer book. Section B consists of TWENTY questions FIVE marks each. ANY FIFTEEN out of them have to answered. If more number of questions are attempted, score off the answers not to be evaluated, else only the first fifteen unscored answered will be considered.
11. Answer for each question in Section B should be started on a fresh page. Question numbers must be written legibly and correctly in the answer book.
12. In all 5 mark questions questions (Section B), clearly show the important steps in your answers. These intermediate steps will carry partial credit.

### SECTION - A

PY-1. The question contains of Twenty Five sub question (1.1-1.25) of ONE mark each. For each of these sub-question, four possible answers(A,B,C and D) are given, out of which one is correct. Answer each sub question by darkening the appropriate bubble on the OBJECTIVE RESPONSE SHEET(ORS) using a soft HB pencil. Do not use the ORS for any rough work. You may like to use the Answer Book for any rough work, if needed.

1.1 Volatile oil from Lemon peels contains d- limonine which is

- (a) Phenyl propane derivative
- (b) Bicyclic Monoterpene derivative
- (c) Monocyclic Monoterpene derivative
- (d) Acyclic Sesquiterpene derivative

1.2 In case of *Digitalis purpurea*, the cardiac activity is maximum with

- (a) Odoroside-H
- (b) Digoxin
- (c) Digitoxin
- (d) Purpurea glycoside-A

1.3 Dragendorff's reagent does not give positive test with

- (a) Emetine
- (b) Morphine
- (c) Caffeine
- (d) Codeine

1.4 The instrument used to measure particle volume is

- (a) Coulter Counter
- (b) Microscope
- (c) Hempel Burette
- (d) Helium Densitometer

1.5 The purpose of seal coating in sugar coating process for tablets is

- (a) To prevent moisture penetration into the tablet core
- (b) To round the edges and build up the tablet weight
- (c) To impart the desired color to the tablet
- (d) To give lusture to the tablet

1.6 The phenomenon of increasing the solubility of weak electrolytes and non polar molecules by the addition of water miscible solvent in which the drug has good solubility is called

- (a) Complexation
- (b) Cosolvancy
- (c) Solubilization
- (d) Hydrotrophy

1.7 HLB system is used to classify

- (a) Surfactants
- (b) Preservatives
- (c) Antioxidants
- (d) Sequestering agents

1.8 The statement "Store in a cool place" as per IP, means

- (a) Store at room temperature
- (b) Store between 2° to 8° C
- (c) Store at any temperature between 8° to 25° C
- (d) Store at 0° C

1.9 Durability of a tablet to combined effects of shock and abrasion is evaluated by using

- (a) Hardness tester
- (b) Disintegration test apparatus
- (c) Friabilator
- (d) Screw Gauge

1.10 Ion exchange capacity of a resin is dependent on

- (a) The total molecular weight of the resin
- (b) The total number of ion active groups
- (c) Length of ion exchange resin
- (d) Solubility of the ion exchange resins

1.11 In mass spectra, the most intense peak is the

- (a) Base peak
- (b) Metastable ion peak
- (c) Fragment ion peak
- (d) Rearrangement ion peak

1.12 Chemical shift is expressed in one of the following units

- (a)  $\text{cm}^{-1}$
- (b) Amperes
- (c) Parts per million
- (d) mm/ml

1.13 Xenon arc lamp is the source of light in

- (a) Spectroflurimeter
- (b) IR Spectrophotometer
- (c) Flame photometer
- (d) Calorimeter



1.14 Which of the following pairs has an interaction beneficial for routine clinical use

- (a) Pseudoephedrine & Aluminium hydroxide gel      (b) Tetracyclines and Milk of magnesia  
(c) MAO inhibitors and Tyramine                      (d) Choramphenicol and Tolbutamide

1.15 Measurement of which of the following two of the constituents of human plasma is of great value in the differential diagnosis of rheumatoid diseases

- (a) Rheumatoid factor and immunoglobulin G      (b) Rheumatoid factor and C-reactive Protein  
(c) HL-A antigen and C-reactive protein              (d) Immunoglobulin and bradykinin

1.16 Which of the following is valid comparison of live attenuated vaccines versus killed inactivated vaccines

- (a) Hypersensitivity reactions are uncommon among inactivated vaccines  
(b) Live attenuated vaccines are more effective in children  
(c) Live attenuated vaccines are not suitable for pediatrics use  
(d) Replication of the organisms in a live attenuated vaccine increases the stimulation of the immune system there by requiring a lower dose      <http://www.xamstudy.com>

1.17 An antineoplastic agent acting by folate antagonism and having a pteridine ring is

- (a) Trimethoprim              (b) Mercaptopurine              (c) Methotraxate              (d) Folic acid

1.18 One of the following drugs has 1,4-dihydropyridine structure, tertiary amino group in the side chain and Ca<sup>++</sup> channel antagonist action

- (a) Nitrodipline              (b) Nicardipine              (c) Verapamil              (d) Captopril

1.19 IUPAC name for one of the steroidal anti-inflammatory agent is 9- $\alpha$ -Fluoro-11 $\beta$ , 16 $\alpha$ , 17 $\alpha$ , 21-tetrahydroxy-1,4-Pregnadiene-3,20-dione

- (a) Predenisolone              (b) Betamethasone              (c) Triamcinolone              (d) Dexamethasone

1.20 CLOFAZIMINE belongs to a class of

- (a) Rhiminophenazines                              (b) Aryl piperazines  
(c) Phenothiazones                                  (d) Benzyl piperazines

1.21 One of the drug is odd one in terms of its biological action

- (a) Diethyl Stilbesterol                              (b) Tamoxifen  
(c) Ethynyl Estradiol                                  (d) Mestranol

1.22 The key intermediates for the synthesis of TIMOLOL are

- (a) 3,4-dichloro-1,2,5-thiadiazole and morpholine      (b) 3,4-dichloro-1,2,5-thiadiazole and piperazine  
(c) 3,4-dibromo-1,2,5-thiadiazole and piperazine      (d) 3-chloro-1,2,5-thiadiazole and morpholine

1.23 One of the following drug interrupts the synthesis of thyroid hormones by preventing iodine incorporation into the tyrosyl residue of thyroglobulin

- (a) Levothyroxine                                      (b) Liothyronine  
(c) Propyl thiouracil                                  (d) Triodo thyronine

1.24 Macrolide antibiotics exert their action by

- (a) Inhibiting transcription                              (b) Altering the genetic code  
(c) Terminating protein synthesis prematurely      (d) Post-translational modification

1.25 One of the following is selective  $\beta_2$ -stimulant

- (a) Caffeine                      (b) Salbutamol                      (c) Propranolol                      (d) Betahistine

**PY-2. The question contains of Twenty Five sub question(2.1-2.25) of TWO mark each. For each of these sub-question, four possible answers(A,B,C and D) are given, out of which one is correct. Answer each sub-question by darkening the appropriate bubble on the OBJECTIVE RESPONSE SHEET(ORS) using a soft HB pencil. Do not use the ORS for any rough work. You may like to use the Answer Book for any rough work,if needed.**

2.1 Cascaroside A is an example of

- (a) O-Glycoside                      (b) C-Glycoside  
(c) N-and-S-Glycoside                      (d) O-and-C-Glycoside

2.2 Precursor of the biosynthesis of Tropane group of alkaloids is

- (a) Leucine                      (b) Lysine                      (c) Ornithine                      (d) Tyrosine

2.3 The extraction of steroidal saponins on commercial scale is from

- (a) Dioscorea                      (b) Digitails                      (c) Datura                      (d) Trigonella

2.4 *Rauwolfia serpentina* Benth., can be distinguished from other adulterants/ substitutes of *Rauwolfia* spp. by

- (a) Presence of starch grains                      (b) Presence of calcium oxalate crystals  
(c) Presence of trichomes                      (d) Presence of sclereids

2.5 Schedule FF contains the list of the following

- (a) Drug which can be marketed under generic names only  
(b) Drug which are habit forming  
(c) Standards for ophthalmic preparation  
(d) Drug which are exempt from certain provisions applicable to manufacturing

2.6 One of the following equations is used to predict the stability of a drug product at room temperature from experiments at accelerated temperature

- (a) Stokes equation                      (b) Arrheniuns equation  
(c) Yong equation                      (d) Michaelis-Menten equation

2.7 One of the following apparatus is used to determine the particle size by the gravity sedimentation method

- (a) Pkynometer                      (b) Ostwald viscometer  
(c) Andreasen apparatus                      (d) Friabilator

2.8 One of the following mills works on both the principles of attrition and impact

- (a) Cutter mill                      (b) Hammer mill                      (c) Roller mill                      (d) Fluid energy mill

2.9 A commonly used antioxidant for oil system is

- (a) Butylated hydroxyl toluene                      (b) Ascorbic acid  
(c) Sodium metabisulfite                      (d) Thioglycol

2.10 In *Digitalis* glycoside  $C_{17}$  position of the steroidal ring is substituted by

- (a)  $\alpha$ - $\beta$  unsaturated five membered lactone ring                      (b)  $\alpha$ - $\beta$  unsaturated six membered lactone ring  
(c)  $\alpha$ - $\beta$  unsaturated six membered ring                      (d)  $\alpha$ - $\beta$  unsaturated five membered lactam ring

2.11 Metoprolol is sometimes preferred to Propranolol because

- (a) It has both  $\alpha$  and  $\beta$  adrenergic blockade
- (b) It has both vasodilator properties and betaadrenergic blocker
- (c) It is a  $\beta_1$  selective antagonist and it does not enter the brain
- (d) It is a  $\beta_2$  selective antagonist

2.12 The major product formed by the condensation of 2-trifluoromethyl phenothiazine with sodamide and 1-(3chloro-1-methyl piperazine)

- (a) Trifluoperidol
- (b) Trifluoperazine
- (c) Trifluopromazine
- (d) Trifluophenothiazine

2.13 One of the following statements is characteristic for natural estrogens

- (a) Aromatic ring with phenolic group and an estrane nucleus
- (b) Aromatic ring with an alcoholic group and a pregnant nucleus
- (c) Reduced ring system belonging to the class estrane
- (d) Reduced ring system belonging to the class pregnane

2.14 One of the following opioid peptides is released from pro-opio melanocortin (POMC)

- (a) Somatostatin
- (b) Beta-endorphin
- (c) Leu-enkephalin
- (d) Dynorphin

2.15 The ultra short-acting barbiturates have brief duration of action due to

- (a) High degree of binding to plasma protein
- (b) Low lipid solubility resulting in a minimal concentration in the brain
- (c) Metabolism is slow in the liver
- (d) Rapid rate of redistribution from the brain due to its high liposolubility

2.16 Derivasation is done in GC

- (a) To convert a less polar compound to a more polar compound
- (b) To make the compound non-volatile
- (c) To convert a polar compound to a more polar compound
- (d) To liquefy a solid

2.17 Qualitative analysis by polarography is based on

- (a) Electrode potential
- (b) Half wave potential
- (c) Migration current
- (d) Limiting current

2.18 The stationary phase used in gel permeation chromatography is

- (a) Alumina
- (b) Charcoal
- (c) Squalene
- (d) Styrene divinyl benzyl co-polymer

2.19 A conductivity cell consists of

- (a) Two platinised-platinum electrode system
- (b) A platinum-calomel electrode system
- (c) A platinum-tungsten electrode system
- (d) A glass-calomel electrode system

2.20 A typical example of exotoxin is

- (a) Lipid-A
- (b) Cytokine
- (c) Tetanospasmin
- (d) Tuberculin

- 2.21 A specimen isolated from a patient suffering from septicemia was found to be a strict aerobe. Its culture vial had a characteristic grape like odour and it was susceptible to carbenicillin. Identify the organism
- (a) *Pseudomonas fluorescens* (b) *Salmonella typhi*  
 (c) *Staphylococcus* (d) *Pseudomonas aeruginosa*
- 2.22 The pKa of lidocaine is 7.9. if the pH of the infected is 8.9, the fraction of the drug in the ionized form will be
- (a) 1% (b) 10% (c) 90% (d) 99%
- 2.23 The drug regimen useful in the treatment of both intestinal and extra-intestinal symptoms of amoebiasis orally is
- (a) Diloxanide and Iodoquinol (b) Paramomycin  
 (c) Metronidazole and Diloxanide (d) Chloroquine alone
- 2.24 The drug NIFEDIPINE can be synthesized from
- (a) O-nitro benzaldehyde methyl acetoacetate and ammonia  
 (b) P-nitro benzaldehyde methyl acetoacetate and ammonia  
 (c) O-nitro benzaldehyde ethyl acetoacetate and methylamine  
 (d) P-nitro benzaldehyde methyl acetoacetate and methylamine
- 2.25 Methyl malonyl CoA mutase which catalyzes the conversion of propionyl CoA to succinyl utilizes the prosthetic group derived from
- (a) Cynocobalamine (b) Pyridoxine (c) Thiamine (d) Nicotinamide

## SECTION - B

**This section consists of TWENTY questions of FIVE marks each. Attempt ANY FIFTEEN questions. Answers must be given in the answer book provided. Answer for each question must start on a fresh page and must appear at one place only. (Answers to all parts of a question must appear together).**

**PY-3** Write your inferences in one or two words only

- (a) Two different samples of aloes are dissolved separately in water. 2 ml of the above solutions are treated separately with 2 ml Bromine water
- (i) A pale yellow precipitate with violet supernatant liquid is seen  
 (ii) A pale yellow precipitate with no violet supernatant liquid is seen
- (b) A crude drug sample consisting of dried leaflets gave a positive Borntrager's test
- (c) When an air-dried latex is dissolved in water and treated with chloride solution-a red color develops
- (d) Draw the structural formula of RESERPINE

**PY-4** In a comparative chemical study of Morphine, Codeine and Thebaine, the following observations are noted.

Give your inferences

- (a) Morphine forms dibenzoate, Codeine forms a monobenzoate  
 (b) Morphine gives a positive ferric chloride test and other do not



- (c) Codeine give one molecule of  $\text{CH}_3\text{I}$  when heated with HI where as Thebaine gives two molecule of  $\text{CH}_3\text{I}$
- (d) Morphine of treatment with halogen acid gives a monohalogen derivative
- (e) All the three alkaloids combine with  $\text{CH}_3\text{I}$  to form methiiodide

**PY-5** With respect to Ceylon Cinnamon, Give

- (a) Botanical source with family
- (b) Main active constituent with its chemical nature
- (c) Chemical structure of the main active constituent

**PY-6** Assign the bands in the IR spectrum for appropriate groups given below:

$>\text{C}=\text{O}$ , Aromatic compound,  $-\text{OH}$ ,  $>\text{C}=\text{C}$ ,  $-\text{C}=\text{C}-$

- (a)  $3700-3500\text{cm}^{-1}$
- (b)  $1740-1720\text{cm}^{-1}$
- (c)  $1667-1640\text{cm}^{-1}$
- (d)  $2260-2100\text{cm}^{-1}$
- (e)  $900-675\text{cm}^{-1}$

**PY-7** In the microbiological assay of ERYTHROMYCIN, IP

- (a) Name the organism used
- (b) Name the solvent used
- (c) What is the buffer used
- (d) In what pH is the experiment done
- (e) What is the incubation temperature?

**PY-8** (a) 0.25g of a compound  $\text{C}_{10}\text{H}_{15}\text{NO}\cdot\text{HCl}$  was titrated with 0.1 M  $\text{HClO}_4$ . It consumed 12.5 ml of the titrant

- (i) What is the stoichiometric factor used for the calculation of percentage purity?
- (ii) Calculate the percentage purity

(b) Write the formula used and calculate the absorbance of a solution of a compound having an  $\epsilon_{\text{max}}$  6200 when 0.05 mM solution is measured in a 1cm cell <http://www.xamstudy.com>

**PY-9** (a) Complete the following reaction giving appropriate structures

O-toluidine is treated with 2-Bromo propionyl bromide, the resulting product is treated with propylamine to get the drug

(b) To which therapeutic category does not drug belong?

**PY-10** 2-amino-4,5 dimethoxy benzoic acid  $\xrightarrow{\text{NaOCN}}$  A

$\xrightarrow{\text{PCl}_3/\text{PCl}_5}$  B  $\xrightarrow{\text{NH}_3}$  C  $\xrightarrow{1-(2\text{-Furoyl piperazine})}$  D

- (a) Write the products at A, B, C, D
- (d) To which therapeutic category does the drug D belong

**PY-11** 2H-1, 2, 4-Benzothiadiazine-7-sulfonamide-6-chloro-1, 1-dioxide, can be modified to change biological properties. Comment on the effected of the following modifications to the structure

- (a) Saturation of-3-4-double bond
- (b) Substitution of 6-chloro by- $\text{CF}_3$
- (c) Insertion of a benzyl group at position 3
- (d) Insertion of a methyl group at position 2
- (e) Saturation of 3, 4-double bond, insertion of a benzyl at position 3, and substitution of 6-Cl by $\text{CF}_3$





## ANSWER KEY GATE 2002

### Section - A

1.1 - c	1.2 - c	1.3 - c	1.4 - d	1.5 - a
1.6 - b	1.7 - a	1.8 - c	1.9 - c	1.10 - b
1.11 - a	1.12 - c	1.13 - a	1.14 - a	1.15 - a
1.16 - a	1.17 - c	1.18 - b	1.19 - c	1.12 - a
1.21 - b	1.22 - a	1.23 - c	1.24 - d	1.25 - b
2.1 - a	2.2 - c	2.3 - a	2.4 - d	2.5 - c
2.6 - b	2.7 - c	2.8 - d	2.9 - a	2.10 - b
2.11 - c	2.12 - b	2.13 - a	2.14 - b	2.15 - d
2.16 - c	2.17 - b	2.18 - d	2.19 - a	2.20 - c
2.21 - d	2.22 - c	2.23 - c	2.24 - c	2.25 - a

# GPAT QUESTION PAPER 2001 WITH ANSWER KEY

## PHARMACEUTICAL SCIENCE


**MM : 200**

**Time : 3 hours**

**Read the following instruction carefully.**

1. All answer must be written in ENGLISH.
2. This question paper consists of TWO SECTIONS : Section 'A' and 'B'.
3. Section A consists of two questions of the multiple choice type. Question 1 consists of TWENTY FIVE sub-questions of ONE mark each and Questions 2 consists of TWENTY FIVE sub-question of TWO marks each.
4. Answer Section A only on the special machine-gradable OBJECTIVE RESPONSE SHEET (ORS). Questions in Section A will not be graded if answered elsewhere.
5. Write your name, registration number and the name of the center at the specified locations on the right half of the ORS for Section A .
6. Using a HB pencil, darken the appropriate bubble under each digit of your registration number .
7. Questions in Section A are to be answered by darkening the appropriate bubble (marked A, B, C or D) using a HB pencil against the question number on the left hand side of the ORS. In case, you wish to change an answer, erase the old answer completely using a good sort eraser.
8. The ORS will be collected after 120 minutes from the start of the examination. In case you finish Section A before the expiry of 120 minutes, you may start answering Section B.
9. There will be NEGATIVE marking in Section A. for each wrong answer to 1-and 2- mark sub-questions, 0.25 and 0.5 marks will be deducted respectively. More than one answer marked against a question will be deemed as an incorrect response and will be negatively marked.
10. Answer questions in Section B in the answer book. Section B consists of TWENTY questions FIVE marks each. ANY FIFTEEN out of them have to answered. If more number of questions are attempted, score off the answers not to be evaluated, else only the first fifteen unscored answered will be considered.
11. Answer for each question in Section B should be started on a fresh page. Question numbers must be written legibly and correctly in the answer book.
12. In all 5 mark questions questions (Section B), clearly show the important steps in your answers. These intermediate steps will carry partial credit.

### SECTION - A

 The question consists of TWENTY FIVE sub-questions (1.1-1.25) of ONE mark each. For each of these sub-questions, for possible answers (A, B, C and D) are given, out of which one is correct. Answer each sub-question by darkening the appropriate bubble on the OBJECTIVE RESPONSE SHEET (ORS) using a soft HB pencil. Do not use the ORS for any rough work. You may like to use the Answer Book for any rough work, if needed.

1.1 Starting material for the synthesis of L-Thyroxine is

- (a) 2-amino-5-chloro-acetophenone (b) Phenyl alanine  
(c) 2-amino-5-chloro-benzophenone (d) L-tyrosine

1.2 One of the following antianxiety agent is an azaspirodecanedione derivative.

- (a) Lorazepam (b) Cycloheptadiene (c) Meprobamate (d) Buspirone

1.3 Include the following drug under proper classification. NIFEDIFINE

- (a) Quinoline derivative (b) Aryl piperidine  
(c) Isoquinoline derivative (d) Pyridine derivative

1.4 Acetazolamide can be synthesized from on of the following intermediates.

- (a) 5-amino-2-mercapto-1, 3-thiazole (b) 5-amino-2-mercapto-1, 3, 4-thiadiazole  
(c) 5-amino-2-mercapto-1, 2, 3-thiadiazole (d) 5-amino-2-mercapto-1, 3, 4-tetrazole

1.5 Choose the correct trichomes of *Digitalis purpurea*

- (a) Numerous covering trichomes and a few glandular trichomes  
(b) Few covering trichomes  
(c) Few glandular trichomes and few covering trichomes  
(d) Few glandular trichomes

1.6 PANAXADIOL is a constituent of

- (a) Ginger (b) Jatamansi (c) Ginseng (d) Pepper

1.7 The plant hormone which shows specific effect on the cell division is

- (a) Auxins (b) Abscisic Acid (c) Cytokinins (d) Ethylene

1.8 One of the following condition is maintained in programmed temperature gas chromatography

- (a) Temperature of the whole column is raised during analysis  
(b) Temperature at the sample injection system is raised  
(c) Temperature at the detector is gradually raised  
(d) Temperature at the recorder alone is raised

1.9 A BOLOMETER consist of

- (a) Two metals welded together  
(b) A thin blackened platinum strip in an evacuated vessel  
(c) Deuterated triglycine sulphate  
(d) Tungsten wire

1.10 Choose the correct exceptient for enhancing solubility in tablet manufacture.

- (a) PEG (b) Microcrystalline cellulose  
(c) Tak (d) Lactose

1.11 Two or more ions present together can be determined successfully by polarographeven if their half wave potentials overlap or interfere by

- (a) Titration (b) Complexation (c) Filtration (d) Heating

1.12 One of the following is selective. SEROTONIN reuptake inhibitor

- (a) Desipramine (b) Fluoxetine (c) Buspropion (d) Maprotiline

1.13 Plasmodial resistance of CHLOROQUINE is due to

- (a) Induction of inactivating enzymes
- (b) Change in receptor structure
- (c) Increase in the activity of DNA repair mechanism
- (d) Decreased carrier-mediated drug transport

1.14 One of the following actions of opioid analgesic is mediated via kappa receptors

- (a) Cerebral vascular dilation
- (b) Euphoria
- (c) Spinal analgesia
- (d) Physical dependence

1.15 One of the following drugs has activity against Herpes simplex virus type I and is used topically.

Systematic administration of the same results in bone marrow depression, hepatic dysfunction and nephrotoxicity.

- (a) Acyclovir
- (b) Amantadine
- (c) Vidarabine
- (d) Idoxuridine

1.16 A woman has to be treated for upper respiratory tract infection. Six years back she was found hypersensitive to penicillin V. The cultures now reveal a strain of Streptococcus pneumonia that is sensitive to all of the following drugs. Which one would be the best choice for the patient

- (a) Amoxicillin
- (b) Erythromycin
- (c) Cefaclor
- (d) Cycloacillin

1.17 The units of measurement for conductance is

- (a) Ohms
- (b) Amperes
- (c) Mhos
- (d) Milli volts

1.18 The shells of soft gelatin capsules made elastic or plastic like, by addition of

- (a) Sorbitol
- (b) Povidone
- (c) PEG
- (d) HPMC

1.19 The rate of drug bioavailability is most rapid when the drug is formulated as a

- (a) Controlled release product
- (b) Hard gelatin capsule
- (c) Tablet
- (d) Solution

1.20 The loading dose of a drug is usually based on

- (a) Total body clearance of the drug
- (b) Percentage of the drug bound to plasma proteins
- (c) Fraction of drug excreted unchanged in urine
- (d) Apparent volume of distribution and desired drug concentration in plasma

1.21 Browne's tubes are most commonly used chemical indicator for

- (a) Ethylene oxide sterilization
- (b) Radiation sterilization
- (c) Heat process sterilization
- (d) Filtration sterilization

1.22 A specimen obtained from a patient's cerebrospinal fluid, cultured in specialized media for about five weeks showed the presence of bent rods and tested positive with Ziehl-Neelsen reagent. Identify the organism

- (a) *Nisseria meningitides*
- (b) *Mycobacterium tuberculosis*
- (c) *Bacteroides fragilis*
- (d) *Leptospira interrogans*

1.23 Staphylococcus aureus is used for the I.P. assay of

- (a) Doxycycline
- (b) Bleomycin
- (c) Kanamycin
- (d) Carbenicillin



1.24 State pharmacy council should have the following number of elected members

- (a) Six (b) Nine (c) Five (d) Seven

1.25 Drug combination WARFARIN/VITAMIN-K results in a specific interaction. Identify.

- (a) Antagonistic (b) Increased sedation  
(c) No known interaction (d) Harmful only in the presence of oxidizing agent

**PY-2. The question contains of Twenty Five sub question(2.1-2.25) of TWO mark each. For each of these sub-question, four possible answers(A,B,C and D) are given, out of which one is correct. Answer each sub-question by darkening the appropriate bubble on the OBJECTIVE RESPONSE SHEET(ORS) using a soft HB pencil. Do not use the ORS for any rough work. You may like to use the Answer Book for any rough work,if needed.**

2.1 In the glucuronidation reaction of OXAZEPAM-the functional group responsible is

- (a) OH (b) COOH (c) SH (d) NH<sub>2</sub>

2.2 Benzhydryl bromide when treated with 2-dimethyl amino ethanol in presence of K<sub>2</sub>CO<sub>3</sub> gives one of the following

- (a) 2-diphenyl ethoxy-N, N-dimethyl ethylamine (b) 2-diphenyl methoxy-N, N-diethyl ethylamine  
(c) 2- diphenyl methoxy-N, N-dimethyl ethylamine (d) 2-diphenyl methoxy-N, N-diethyl methylamine

2.3 Demeclocycline differs from Chlortetracycline only by

- (a) Absence of methyl group on C<sub>6</sub> (b) Absence of OH group on C<sub>6</sub>  
(c) Absence of dimethylamino group on C<sub>4</sub> (d) Absence of OH group on C<sub>3</sub>

2.4 Choose the IUPAC name for Carbamazepine

- (a) 5[3-(dimethylamino)ethyl] 10-11 dihydro-5H dibenz[b, f]azepine  
(b) 5H dibenz[b, f] azepine-5-carboxamide <http://www.xamstudy.com>  
(c) 5H dibenz[b, f] azenpine-5-acid chloride  
(d) 5[3-(dimethylamino)propyl]10-11 dihydro-5H dibenz[b,f]azepine

2.5 Reserpine is derived from

- (a) Squalene (b) Homoserine  
(c) Tryptophan and tryptamine (d) Asparazine

2.6 An alkaloid from Atropa belladone having the molecular formula C<sub>17</sub>H<sub>23</sub>O<sub>3</sub>N having α-D22<sup>0</sup> when warmed with ethanolic alkaline solution is converted into

- (a) (-) Hyoscyamine (b) (±) Hyoscyamine (c) (+) Hyoscyamine (d) (±) Hyoscine

2.7 Choose the appropriate description for Ergot

- (a) Loosely arranged or in small more or less agglutinated angular mass  
(b) A pseudoparenchyma formed by the interwooving closely appressed compact septate hyphae  
(c) The cryptocarps have fallen out leaving corresponding oval perforations in the ramuli  
(d) Colourless septate hyphae about one quarter the width of the cotton trichome and they become twisted together

2.8 Characteristic bands observed in the IR spectra of alcohol result from

- (a) OH and CO stretching (b) OH stretching (c) CO stretching only (d) CH bending only

2.9 Bulking agent used for parenteral preparation is

- (a) Sodium metabisulphide (b) Benzyl alcohol (c) Carbolic acid (d) Sorbitol

2.10 Identify the correct non-flammable propellant

- (a) Trichloromonofluoromethane (b) Dichloromonofluoromethane  
(c) Dimethylether (d) Difluoromethane

2.11 Elastomer used in rubber stopper formulation is

- (a) Polybutadiene (b) Butyl stearate  
(c) Titanium dioxide (d) Butylated hydroxyl toluene

2.12 Schedule D as per D & C Act is concerned with

- (a) List of drugs exempted from the provision of import of drugs  
(b) Diseases or ailments which a drug may not purport to prevent or cure  
(c) Requirements of factory premises  
(d) List of prescription drugs

2.13 Official method for the analysis of Ciprofloxacin is by

- (a) Potentiometry (b) HPLC  
(c) Gas Chromatography (d) Non-aq. titration

2.14 The radiofrequency radiation is associated with

- (a) Light consisting of one colour only (b) Nuclear Magnetic Resonance  
(c) Mass Spectrometry (d) ESR

2.15 How many grams of drug should be used in preparing 500 ml of a 1:2500 solution

- (a) 0.2 (b) 0.02 (c) 0.4 (d) 1.25

2.16 The pyroelectric detector converts electromagnetic radiation into

- (a) Electrical Signal (b) Fluorescence (c) Electrons (d) Visible light

2.17 The mechanism of Digitalis is

- (a) Decreases intracellular Na concentration  
(b) Inhibits Na-K ATPase  
(c) Activated adenyl cyclase which produces c-AMP  
(d) Decreased Release of Calcium from Sarcoplasmic reticulum

2.18 The mechanism of action for Dactinomycin is

- (a) Inhibits Topoisomerase II (b) Cross links DNA  
(c) Inhibits functions of microtubules (d) Inhibits DNA Polymerase

2.19 One of the drugs when coadministered with Terfenadine may lead to life threatening Cardiac dysrhythmia

- (a) Lomafloxacin (b) Clofazimine (c) Itraconazole (d) Neomycin

2.20 Adverse effects of one of the drug include amenorrhea, bone marrow depression gastrointestinal distress and haemorrhagic distress. Identify?

- (a) Cyclizine (b) Piroxicam (c) Cyclophosphamide (d) Cimetidine

2.21 *Varicella zoster* is the causative organism for

- (a) Small Pox (b) Dermatophytosis  
(c) Herpes (d) Infectious mononucleosis

2.22 One of the following is confirmed by diagnosis test

- (a) Hyperuricemia      (b) Cystic fibrosis      (c) Acute pancreatitis      (d) Hyperlipidemia

2.23 The conversion of fructose 1,6-biphosphate to Glyceraldehyde-3-phosphate is catalysed by

- (a) Phosphoglycerate kinase      (b) Enolase  
(c) Aldolase      (d) Triose phosphate isomerase

2.24 Morphine undergoes microsomal oxidation by

- (a) N-dealkylation      (b) Aromatic hydroxylation  
(c) Oxidative deamination      (d) O-dealkylation

2.25 SULFASALAZINE is a prodrug that is activated in the intestine by bacterial enzymes.

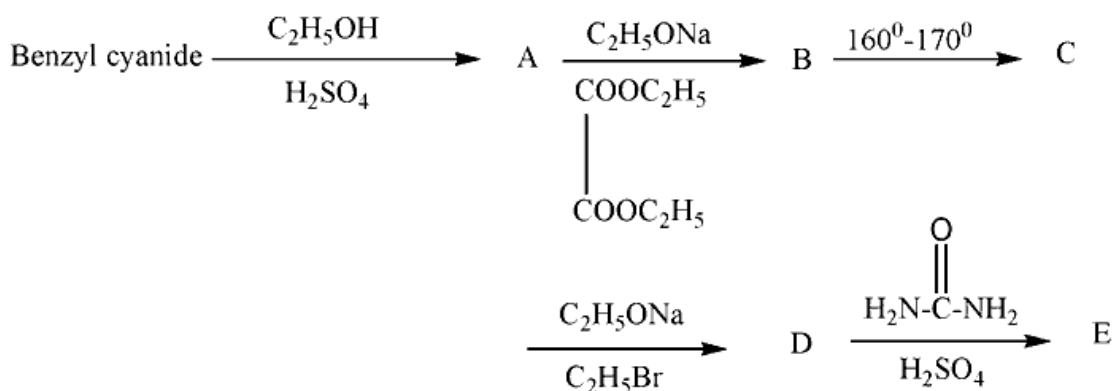
The enzyme responsible is :

- (a) Azoreductase      (b) Choline esterase  
(c) Glucuronyl transferase      (d) Amylase

### SECTION - B

This section consists of TWENTY questions of FIVE marks each. Attempt ANY FIFTEEN questions. Answers must be given in the answer book provided. Answer for each question must start on a fresh page and must appear at one place only. (Answers to all parts of a question must appear together).

3. (a) Which is the active isomer of dimethyl stilbestrol?  
(b) Inhibition or decreased enzyme activity can result from different types of interaction namely:  
(i) Non-covalent interaction between the enzyme and drug.  
(ii) Covalent interaction between the enzyme and drug.  
(iii) Mutually exclusive binding of the substrate and inhibitor. (iv) Binding on an allosteric site on the enzyme.
4. Complete the following reactions by giving appropriate structures:  
(a) 2, 6-dimethyl aniline is treated with chloroacetyl chloride  
(b) Product at (a) is treated with dimethylamine to get the final product (c) What is the generic name of the final product?
5. Complete the following by giving appropriate structures at A, B, C, D, E.



6. Following modifications of the prototypes of HYDROCORTISONE represent attempts to increase glucocorticoid activity while decreasing mineralocorticoid activity:
- Introduction of double bond at C<sub>1</sub> and C<sub>2</sub>.
  - Fluorination at C<sub>9</sub>.
  - Introduction of double bond at C<sub>1</sub> and C<sub>2</sub> with fluorination at C<sub>9</sub>.
  - Double bond C<sub>1</sub> and C<sub>2</sub>, fluorination at C<sub>9</sub> and α hydroxyl at C<sub>16</sub>.
  - Double bond at C<sub>1</sub> and C<sub>2</sub> fluorination at C<sub>9</sub>, α methyl at C<sub>16</sub>.
- Give the generic names of the products formed.
7. (a) Name the part of *Syzygium aromaticum* which is used officially as the drug.  
 (b) Where does the ovary situated in the above drug.  
 (c) Which type of typical stomata is present in the above drug.  
 (d) The G.C. analysis of the volatile oil from the above drug gives two characteristic major peaks. Name the probable constituents.
8. PAPAVERINE an alkaloid of molecular formula C<sub>20</sub>H<sub>21</sub>O<sub>4</sub>N undergoes degradation reactions. Give only the structural formulae of the products formed in the following reactions.
- With hot concentrated Potassium permanganate
  - With cold dilute Potassium permanganate
9. Following statements are characteristic for particular terms used. Identify and name the terms:
- In plant breeding it is a possible means of combining in a single variety the desirable characters of two or more lines, variety or species and occasionally of producing new and desirable characters not found in either parent
  - Changes in the genetic make up of the plant
  - Chromosomes can be grouped not in pairs, but in threes, fours or higher numbers.
  - Plants occur with one or more chromosomes extra to the somatic number
  - Plant protoplasts which can be maintained in culture and can be induced to fuse either with others of the same or different species.
10. List the five important components in mass spectrometer.
11. In the assay of Pyridoxine Hydrochloride I.P.
- Name the solvent used for dissolution of sample
  - Name the inorganic reagent which is added subsequently
  - What is the reason for its addition?
  - Name the tirant used
  - Give the structure of the final product

12. (a) Give the number of NMR signals given by the following compounds:
- (i)  $\text{CH}_3\text{-}\overset{\text{O}}{\parallel}{\text{C}}\text{-CH}_3$                       (ii)  $\text{CH}_3\text{-}\overset{\text{OH}}{\text{C}}\text{-CH}_3$
- (b) Why a solvent free of proton should be used for conventional NMR spectroscopy.
- (c) Name the reference material used for proton spectro in non-aqueous medium.
- (d) Why the signals in NMR are split? Answer in one sentence only.
13. List the five steps involved with capsule shell manufacture in an automatic process.
14. Give five advantages of loaded RBC as drug delivery system.
15. Penicillin solution has a half life of 21 days. How long will it take for the potency to drop to 80% of initial potency. Penicillin undergoes first order kinetics. Give all steps in the calculation.
16. List the five official tests which are performed for plastic containers for injectables.
17. Give the names of:
- (a) A vasodilator that can cause hirsutism.
- (b) An ACE inhibitor that may cause renal damage in the foetus.
- (c) A local anaesthetic that can interfere with the action of guanethiding.
- (d) A class of vasodilators that is useful to reduce proteinuria in diabetics.
- (e) A receptor, blocking of which is important for neuroleptic action.
18. (a) What are the two major limitations to the general use of immuno suppressive agents? Answer in one sentence each. <http://www.xamstudy.com>
- (b) Name two main kinds of motor disturbances produced by neuroleptic drugs.
- (c) Name the class of drug that is dangerous when the person had a meal with a high content of fermented foods.
19. (a) Give the name of a Phosphonoformate derivative which has antiviral activity.
- (b) What is its mechanism of action? Answer in one sentence only.
- (c) Name two major adverse effects of the drug.
20. Given below are some typical bio-chemical reactions. Write the names of the enzymes which catalyses these reactions:
- (a)  $\text{CH}_3\text{CH}_2\text{-OH} + \text{NAD}^+ \rightarrow \text{CH}_3\text{CHO} + \text{NADH} + \text{H}^+$
- (b)  $\text{Glucose} + \text{ATP} \rightarrow \text{Glucose-6-phosphate} + \text{ADP} + \text{H}^+$
- (c)  $\text{Pyruvate} \rightarrow \text{Acetaldehyde} + \text{CO}_2$  .
- (d)  $\text{Glyceraldehyde-3-phosphate} \rightarrow \text{Dihydroxy acetone phosphate}$ .
- (e)  $\text{Glutamate} + \text{NH}_3 + \text{ATP} \rightarrow \text{Glutamine} + \text{ADP} + \text{Pi}$ .



21. (a) What is the chemical nature of Glucagon?  
 (b) For which biochemical reaction is it required for?  
 (c) Give the name of the clinical condition for which it is used for.  
 (d) What type of dosage form in which it is used?  
 (e) Where is it secreted?
22. (a) In Type I and Type II hypersensitivity reactions name the corresponding antibodies.  
 (b) Name a mood elevator which is an amphetamine analog.  
 (c) The drug at - (b) when coadministered with, which class of drug can result side effects like arrhythmia and hypertension.  
 (d) When digoxin is used with Omeprazole, Plasma levels digoxin is increased or decreased?

**End of paper**

**ANSWER KEY GATE - 2001**

**Section - A**

1.1 - d	1.2 - d	1.3 - d	1.4 - b	1.5 - a
1.6 - c	1.7 - c	1.8 - a	1.9 - a	1.10 - d
1.11 - b	1.12 - b	1.13 - d	1.14 - c	1.15 - a
1.16 - b	1.17 - c	1.18 - a	1.19 - d	1.20 - d
1.21 - c	1.22 - b	1.23 - a	1.24 - d	1.25 - a
2.1 - a	2.2 - c	2.3 - a	2.4 - b	2.5 - c
2.6 - b	2.7 - b	2.8 - a	2.9 - d	2.10 - a
2.11 - a	2.12 - a	2.13 - b	2.14 - b	2.15 - a
2.16 - a	2.17 - b	2.18 - a	2.19 - c	2.20 - c
2.21 - c	2.22 - b	2.23 - c	2.24 - a	2.25 - a

# GPAT QUESTION PAPER 2000 WITH ANSWER KEY

## PHARMACEUTICAL SCIENCE

Time : 3 hours

Maximum Marks : 150

Read the following instruction carefully.

1. All answers must be written only in the answer-book provided.
2. This question paper consists of **TWO SECTIONS** : Section 'A' and 'B'.
3. **Section A** consists of two questions of the multiple choice type. Question 1 consists of **TWENTY FIVE** sub-questions of **ONE** mark each and Questions 2 consists of **TWENTY FIVE** sub-question of **TWO** marks each.
4. The answers to the multiple type questions must be written only in the boxes provided in the sheet of the answer-book.
5. Answers to **Section B** should be started on a fresh page and should not be mixed with the answers to **Section A**. Question numbers must be written legibly and correctly in the answer-book.
6. **Section B** consists of **TWENTY** questions of **FIVE** marks each. Any **FIFTEEN** out of them have to be answered. If more number of questions are attempted, strike off the answer not to be evaluated, else only the first **FIFTEEN** unscored answers will be considered strictly.
7. In all questions of 5 marks, write, clearly the important steps in your answer. These steps carry partial credit.
8. There will be **NO NEGATIVE** marking.


### SECTION - A

- ☞ (i) This question consists of 25 (Twenty five) multiple choice questions each carrying one mark.  
(ii) Choose the correct answer.  
(iii) Enter (a) or (b), (c) or (d) as the case may be in the boxes corresponding to the questions in the first page of the answer book.

1. One of the substances is listed is used as muco adhesive  
(a) Acacia                      (b) S.C.M.C                      (c) Burnt sugar                      (d) Saccharin
2. In the preparation of multilayer tablets one of the substances listed is used to Hydrophilic matrix coating  
(a) C.M.C                      (b) Shellac                      (c) Stearyl alcohol                      (d) Bees wax
3. Choose the correct pH of the lachrymal fluid  
(a) 8.0                      (b) 6.2                      (c) 7.4                      (d) 9.0
4. The dip tube in an aerosol container is made from one of the following. Choose the correct one  
(a) Polypropylene                      (b) Glass                      (c) Stainless steel                      (d) Aluminium
5. The diameter of the mesh aperture in the I.P disintegration test apparatus is given below. Choose the correct size.  
(a) 2.00 mm                      (b) 4.00 mm                      (c) 1.00 mm                      (d) 1.50 mm

6. Choose the correct source of radiation for N.M.R from the listed ones
  - (a) Klystron oscillator
  - (b) Global source
  - (c) Radio frequency oscillator
  - (d) Deuterium lamp
7. Choose the correct semi-rigid gel used for excusion chromatography
  - (a) Sephadex
  - (b) Gelatin
  - (c) Cellulose
  - (d) Alumina
8. One the following is measured in amperometric titration
  - (a) Resistance
  - (b) Conductance
  - (c) Voltage
  - (d) Current
9. The oil obtained from *Cymbopogan flexuosus* contains one of the following
  - (a) Citral
  - (b)  $\alpha$ -terpeniol
  - (c)  $\alpha$ -pinene
  - (d) Neral
10. Choose the correct key intermediate for the biosynthesis of  $C_6-C_3$  units, which serves as a precursor for the biosynthesis of amino acid
  - (a) Shikimic acid
  - (b) Pyruvic acid
  - (c) Dehydro quinic acid
  - (d) Mevalonic acid
11.  $\beta$ -phenyl-N-alkyl piperidine moiety is largely responsible for activity in one of the following. Choose the correct one
  - (a) Buprenorphine
  - (b) Pethidine
  - (c) Cycloserine
  - (d) Amitryptiline
12. Which one of the following is a Histamine  $H^1$  receptor antagonist?
  - (a) 4-(5-H di benzo [a, d] cyclohepten-5-Ylidene)-1-methyl pyridine hydrochloride
  - (b) 4-(5-H di benzo [a, d] cyclohepten-5-Ylidene)-1-methyl pyrimidine hydrochloride
  - (c) 4-(5-H di benzo [a, d] cyclohepten-5-Ylidene)-1-methyl piperidine hydrochloride
  - (d) 4-(5-H di benzo [a, d] cyclopentane-5-Ylidene)-1-methyl piperidine hydrochloride
13. Dienoestrol is synthesised from
  - (a) 4-Hydroxy propiophenone
  - (b) 4-amino acetophenone
  - (c) 4-Chloro butyrophenone
  - (d) 4-Bromo propiophenone
14. One of the following diuretics has a similar structure as that of antihypertensive agent diazoxide
  - (a) Acetazolamide
  - (b) Chlorothiazide
  - (c) Spironolactone
  - (d) Furosemide
15. Which one of the following is an antifungal polyene macrolide antibiotics with seven conjugated double bond, an internal ester, a free carboxyl group and a glycoside side chain with primary amino group
  - (a) Streptomycin
  - (b) Echinocandins
  - (c) Rifamycin
  - (d) Amphotericin-B
16. Choose the correct class IV anti-arrhythmic that is primarily indicated for the treatment of supra ventricular tachyarrhythmias
  - (a) Mexiletine
  - (b) Diltiazem
  - (c) Nifedipine
  - (d) Propranolol
17. One of the following antiviral agents exhibits the greatest selective toxicity for the invading virus
  - (a) Amantadine
  - (b) Zidovudine
  - (c) Idoxuridine
  - (d) Acyclovir
18. Choose the drug that often causes tachycardia when given in regular doses
  - (a) Verapamil
  - (b) Guanethidine
  - (c) Propranolol
  - (d) Isosorbide dinitrate

19. Choose one appropriate therapeutic use for Imipramine
- (a) Insomnia (b) Epilepsy  
(c) Bed wetting in children (d) Mania
20. The following prescription is given to the pharmacist by the physician to dispense
- R<sub>x</sub>  
Calciferol solution            0.3  
Water to Q.S                    5.0 ml send 25 ml
- Final dosage form of this prescription will be
- (a) Solution (b) Elixir (c) Emulsion (d) Suspension
21. Purpose of a combined drug regimen in tuberculosis is to
- (a) Delay the emergence of drug resistance (b) Reduce the duration of active therapy  
(c) Schedule the onset of therapy (d) Promote a placebo effect on the patient
22. The R-W coefficient test is used to evaluate
- (a) Antibiotic activity (b) Sterility of packaging material  
(c) Nature of organism in bacterial infection (d) Bactericidal activity
23. Diclofenac tablet coated with cellulose acetate phthalate has been administered to a patient. Where do you expect the drug to be released?
- (a) Stomach (b) Oral cavity (c) Small intestine (d) Liver
24. A microscopic examination of a culture isolate revealed spherical bodies with a smooth outline growing in long chains. Identify the micro organism
- (a) *Staphylococcus aureus* (b) *Streptococcus pyogenes*  
(c) *Rhizopus stolonifer* (d) *Bacillus subtilis*
25. An original license or renewed license to sell drugs remains valid upto
- (a) 31<sup>st</sup> March next year in which it is granted <http://www.xamstudy.com>  
(b) 30<sup>th</sup> June of the following year in which it is granted or renewed  
(c) 31<sup>st</sup> January of the same year in which it is granted  
(d) 31<sup>st</sup> December of the year following the year in which it is granted or renewed

 Match each of the items 1 and 2 on the left with an appropriate item on the right [ABCD] and write in the specific space provide in the answer book as shown below.

26. Taste sensation of some liquid oral formulation are given. Match the compatible flavour used in the formulation
- |         |                 |
|---------|-----------------|
| 1. Salt | (A) Wild cherry |
| 2. Sour | (B) Vanilla     |
|         | (C) Citrus      |
|         | (D) Chocolate   |
- (a) 1-B, 2-C (b) 1-C, 2-D (c) 1-C, 2-A (d) 1-A, 2-D

27. Excipients used in parenteral products are given. Match them

- |                      |                      |              |              |
|----------------------|----------------------|--------------|--------------|
| 1. Chelating agents  | (A) Benzyl alcohol   |              |              |
| 2. Local anaesthetic | (B) Phenol           |              |              |
|                      | (C) Gelatin          |              |              |
|                      | (D) Disodium edetate |              |              |
| (a) 1-B, 2-D         | (b) 1-C, 2-D         | (c) 1-C, 2-A | (d) 1-D, 2-A |

28. H.L.B values are given. Match them with correct surfactant

- |              |                        |              |              |
|--------------|------------------------|--------------|--------------|
| 1. 0 – 3     | (A) Solubilizing agent |              |              |
| 2. 4 – 6     | (B) Detergent          |              |              |
|              | (C) Antifoaming agent  |              |              |
|              | (D) W/O emulgents      |              |              |
| (a) 1-B, 2-D | (b) 1-C, 2-D           | (c) 1-C, 2-A | (d) 1-A, 2-D |

29. Given below are the type of excipients. Match them with the examples

- |                 |              |              |              |
|-----------------|--------------|--------------|--------------|
| 1. Disintegrant | (A) Talc     |              |              |
| 2. Glidant      | (B) P.V.P    |              |              |
|                 | (C) Lactose  |              |              |
|                 | (D) Acacia   |              |              |
| (a) 1-B, 2-D    | (b) 1-C, 2-D | (c) 1-C, 2-A | (d) 1-D, 2-A |

30. Listed below are the Schedules to the Drugs and Cosmetics Act. Match them

- |                 |   |              |              |
|-----------------|---|--------------|--------------|
| 1. Schedule 'M' | (A) Standard for disinfectant fluids    |              |              |
| 2. Schedule 'O' | (B) Standard for ophthalmic preparation |              |              |
|                 | (C) Requirement of factory premises     |              |              |
|                 | (D) Standard for cosmetics              |              |              |
| (a) 1-B, 2-D    | (b) 1-C, 2-D                            | (c) 1-C, 2-A | (d) 1-A, 2-D |

31. The following receptors are associated with drug mentioned. Match them

- |                              |                     |              |              |
|------------------------------|---------------------|--------------|--------------|
| 1. H <sub>1</sub> receptor   | (A) Ketanserin      |              |              |
| 2. 5HT <sub>3</sub> receptor | (B) Cimetidine      |              |              |
|                              | (C) Diphenhydramine |              |              |
|                              | (D) Ondansetron     |              |              |
| (a) 1-B, 2-D                 | (b) 1-C, 2-D        | (c) 1-C, 2-A | (d) 1-A, 2-D |

32. Match the following drug with their receptor sub types

- |                 |  |              |              |
|-----------------|--|--------------|--------------|
| 1. Methadone    | (A) Agonist of $\mu$ & $\delta$ receptor               |              |              |
| 2. Enkephanlins | (B) Antagonist of $\mu$ , $\delta$ & $\kappa$ receptor |              |              |
|                 | (C) Agonist of $\mu$ receptor                          |              |              |
|                 | (D) Agonist of $\mu$ , $\delta$ & $\kappa$ receptor    |              |              |
| (a) 1-A, 2-A    | (b) 1-C, 2-D   | (c) 1-C, 2-A | (d) 1-A, 2-D |



33. Match the drug with their mechanism of action

- |                |  |
|----------------|--|
| 1. Mebendazole | (A) Unknown mechanism  |
| 2. Ivermectin  | (B) Neuromuscular blockade by interaction with nicotinic receptor                                |
|                | (C) Intensifies GABA mediated neurotransmission in nematode and cause immobilization of parasite |
|                | (D) Selectively inhibits microtubule synthesis in nematodes                                      |
- (a) 1-D, 2-C      (b) 1-C, 2-D      (c) 1-C, 2-A      (d) 1-A, 2-D

34. Match the following drugs for their mechanism of action

- |                 |                                     |
|-----------------|-------------------------------------|
| 1. Procainamide | (A) Blocks Ca <sup>++</sup> channel |
| 2. Verapamil    | (B) Blocks K <sup>+</sup> channel   |
|                 | (C) Blocks Na <sup>+</sup> channel  |
|                 | (D) Block $\beta$ adrenoceptors     |
- (a) 1-B, 2-D      (b) 1-C, 2-D      (c) 1-C, 2-A      (d) 1-A, 2-D

35. The metabolic reactions of drugs mentioned in A to D are given. Match them

- |                    |                     |
|--------------------|---------------------|
| 1. Nitro reduction | (A) Oxprenolol      |
| 2. Deamidation     | (B) Isoniazid       |
|                    | (C) Chloramphenicol |
|                    | (D) Lidocaine       |
- (a) 1-B, 2-D      (b) 1-C, 2-D      (c) 1-C, 2-A      (d) 1-A, 2-D

36. Drugs given below have the characteristics mentioned in A to D. Match them

- |                  |  |
|------------------|--|
| 1. Ibuprofen     | (A) An aryl acetic acid                  |
| 2. Acetaminophen | (B) A salicylic acid derivative          |
|                  | (C) An active metabolite of another drug |
|                  | (D) Hydrolysed in the blood stream       |
- (a) 1-A, 2-C      (b) 1-C, 2-D      (c) 1-C, 2-A      (d) 1-A, 2-D

37. The systematic names of the following drugs are given. Match them

- |                           |  |
|---------------------------|--|
| 1. Tinidazole             | (A) 2-[4-(3-(2-trifluoromethylpheno)selenazine-10-yl)propylpiperazine-1-yl]ethanol |
| 2. Fluphenazine decanoate | (B) 1-[2-(ethylsulphonyl)ethyl]-2-methyl-5-nitroimidazole                          |
|                           | (C) 1-[2-(ethylsulphonyl)propyl]-2-methyl-5-nitroimidazole                         |
|                           | (D) 2-[4-(3-(2-trifluoromethylphenothiazin-10-yl)propylpiperazine-1-yl)ethanol     |
- (a) 1-B, 2-D      (b) 1-C, 2-D      (c) 1-C, 2-A      (d) 1-A, 2-D

38. Match the heterocyclic system with the drug

- |              |                  |              |              |
|--------------|------------------|--------------|--------------|
| 1. Aziridine | (A) Thiotepa     |              |              |
| 2. Pteridine | (B) Azathioprine |              |              |
|              | (C) Atropine     |              |              |
|              | (D) Methotrexate |              |              |
| (a) 1-B, 2-D | (b) 1-C, 2-D     | (c) 1-C, 2-A | (d) 1-A, 2-D |

39. Techniques mentioned in A to D used for the analysis of the following drugs

- |                          |                           |              |              |
|--------------------------|---------------------------|--------------|--------------|
| 1. Sulphamethoxazole I.P | (A) Conductometry         |              |              |
| 2. Piroxicam I.P         | (B) H.P.L.C               |              |              |
|                          | (C) Non-aqueous titration |              |              |
|                          | (D) Dead stop end point   |              |              |
| (a) 1-D, 2-B             | (b) 1-C, 2-D              | (c) 1-C, 2-A | (d) 1-A, 2-D |

40. Match the correct formula for

- |                                 |                 |              |              |
|---------------------------------|-----------------|--------------|--------------|
| 1. Molar absorption coefficient | (A) $cl/A$      |              |              |
| 2. Frequency                    | (B) $A/c.l$     |              |              |
|                                 | (C) $l/\lambda$ |              |              |
|                                 | (D) $c/\lambda$ |              |              |
| (a) 1-B, 2-D                    | (b) 1-C, 2-D    | (c) 1-C, 2-A | (d) 1-A, 2-D |

41. Match the values given with that of 1 and 2

- |  |              |              |              |
|--|--------------|--------------|--------------|
| 1. Potential of standard hydrogen electrode taken as | (A) Zero     |              |              |
| 2. Base peak in mass spectra                         | (B) 100      |              |              |
|  | (C) 1        |              |              |
|  | (D) 10       |              |              |
| (a) 1-B, 2-D   | (b) 1-A, 2-B | (c) 1-C, 2-A | (d) 1-A, 2-D |

42. In different samples of adulterated *Atropa belladonna* leaves, following unique characters are noted. Match with adulterants

- |  |                                 |              |              |
|--|---------------------------------|--------------|--------------|
| 1. Idioblast observed  | (A) <i>Solanum nigrum</i>       |              |              |
| 2. Lamina is denser Needle shaped<br>Crystals Anomocytic stomata, Palisade ratio 2-4 | (B) <i>Phytolacca americana</i> |              |              |
|  | (C) <i>Ailanthus glandulosa</i> |              |              |
|  | (D) <i>Datura stramonium</i>    |              |              |
| (a) 1-C, 2-B   | (b) 1-C, 2-D                    | (c) 1-C, 2-A | (d) 1-A, 2-D |

43. *Digitalis cardenolides* mentioned below are different hydroxy derivatives. Match them

- |                |  |              |              |
|----------------|--|--------------|--------------|
| 1. Gitoxigenin | (A) 3 $\beta$ , 12 $\beta$ , 14 $\beta$ trihydroxy cardenolide |              |              |
| 2. Digoxigenin | (B) 3 $\beta$ , 14 $\beta$ dihydroxy cardenolide               |              |              |
|                | (C) 3 $\beta$ , 14 $\beta$ , 16 $\beta$ trihydroxy cardenolide |              |              |
|                | (D) 3 $\beta$ , 12 $\beta$ , 6 $\beta$ trihydroxycardenolide   |              |              |
| (a) 1-B, 2-D   | (b) 1-C, 2-D   | (c) 1-C, 2-A | (d) 1-A, 2-D |

44. Match the following Vitamins with their biochemical roles

- |               |   |              |              |
|---------------|---|--------------|--------------|
| 1. Riboflavin | (A) Free radical scavenger                      |              |              |
| 2. Pyridoxal  | (B) As a coenzyme in redox reactions            |              |              |
|               | (C) Essential in the synthesis of rhodopsin     |              |              |
|               | (D) As a coenzyme for amino acid decarboxylases |              |              |
| (a) 1-B, 2-D  | (b) 1-C, 2-D                                    | (c) 1-C, 2-A | (d) 1-A, 2-D |

45. Match the diseases with their clinical tests

- |                      |                                    |              |              |
|----------------------|------------------------------------|--------------|--------------|
| 1. Diabetes mellitus | (A) Decrease in Haemoglobin levels |              |              |
| 2. Cystic fibrosis   | (B) Increase in blood sugar levels |              |              |
|                      | (C) D.N.A diagnosis                |              |              |
|                      | (D) Decreased levels of TSH        |              |              |
| (a) 1-B, 2-D         | (b) 1-B, 2-C                       | (c) 1-C, 2-A | (d) 1-A, 2-D |

46. Match the correct pathways of the following

- |                               |                                     |              |              |
|-------------------------------|-------------------------------------|--------------|--------------|
| 1. Glyceraldehyde-3-Phosphate | (A) Cholesterol synthesis pathway   |              |              |
| 2. Arachidonic acid           | (B) Citric acid cycle               |              |              |
|                               | (C) Glycolysis                      |              |              |
|                               | (D) Prostaglandin synthesis pathway |              |              |
| (a) 1-B, 2-D                  | (b) 1-C, 2-D                        | (c) 1-C, 2-A | (d) 1-A, 2-D |

47. Match the following terms with the definitions given

- |                         |  |              |              |
|-------------------------|--|--------------|--------------|
| 1. Biological half life | (A) Ratio of the median lethal dose to the median effective dose |              |              |
| 2. Therapeutic index    | (B) Dosage used in the treatment                                 |              |              |
|                         | (C) Elimination of the drug to 50% of its original concentration |              |              |
|                         | (D) Time taken for a drug to be absorbed                         |              |              |
| (a) 1-B, 2-D            | (b) 1-C, 2-D   | (c) 1-C, 2-A | (d) 1-A, 2-D |

48. Given below are two vaccines. Their compositions are mentioned. Match them

- |                   |  |              |              |
|-------------------|--|--------------|--------------|
| 1. B.C.G          | (A) Living attenuated <i>Mycobacterium tuberculosis</i>        |              |              |
| 2. Whooping cough | (B) Experimentally killed and freeze dried polio virus         |              |              |
|                   | (C) Antibodies obtained from the sera of tuberculosis patients |              |              |
|                   | (D) Killed <i>bordetella pertussis</i> bacteria                |              |              |
| (a) 1-B, 2-D      | (b) 1-C, 2-D   | (c) 1-C, 2-A | (d) 1-A, 2-D |

49. Match the following diseases with their causative organisms

- |                  |                                  |              |              |
|------------------|----------------------------------|--------------|--------------|
| 1. Helminthiasis | (A) <i>Plasmodium falciparum</i> |              |              |
| 2. Jaundice      | (B) <i>Taenia solium</i>         |              |              |
|                  | (C) <i>Hepatitis-A-Virus</i>     |              |              |
|                  | (D) <i>Toxoplasma gondii</i>     |              |              |
| (a) 1-B, 2-C     | (b) 1-C, 2-D                     | (c) 1-C, 2-A | (d) 1-A, 2-D |

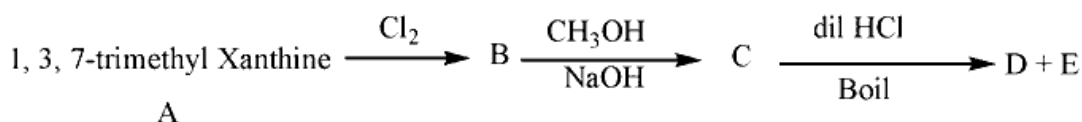
50. Given below are the Schedules as per D and C act 1940. Match them with information to be given in the label

- |               |   |
|---------------|---|
| 1. Schedule H | (A) For external use only   |
| 2. Schedule G | (B) For therapeutic use only  |
|               | (C) Caution-It is dangerous to take this preparation except under medical supervision |
|               | (D) To be sold by retail on the prescription of a R.M.P. only                         |
- (a) 1-B, 2-D      (b) 1-C, 2-D      (c) 1-D, 2-C      (d) 1-A, 2-D

### SECTION - B

*This section consists of 20 (TWENTY) questions of 5 (FIVE) marks each. Attempt ANY 15 (FIFTEEN) questions. Answers must be given in the answer book provided. Answer for each question must start on a fresh page and must appear at one place only.*

3. (a) What is the biological source of clove?  
 (b) Following Phytochemicals are present in specific part of certain plants. Name the biological source mentioning the specific part in which they are present  
 (i) Digitoxin      (ii) Sennosides      (iii) Papaverine      (iv) Panaxadiol
4. Following tests are performed in different samples of Natural Drugs. On the basis of given results identify the class of chemical constituent  
 (a) A thin section is treated with Tincture alkana - red colour is obtained  
 (b) An alcoholic extract of the leaf is treated with Dragendorff's reagent - Reddish brown precipitate is obtained.  
 (c) A pure orange coloured product is dissolved in dry chloroform and treated with dry solution of antimony trichloride in chloroform - Blue or bluish violet colour is obtained.  
 (d) A solution of the substance gives a positive Liebermann - Burchard reaction.  
 (e) A dilute alcoholic extract is treated with Ninhydrin solution - Purple or Pink Colour develops.
5. A natural product is subjected to degradation reaction. Different derivatives are formed as shown below. Give the appropriate structures of A, B, C, D and E.

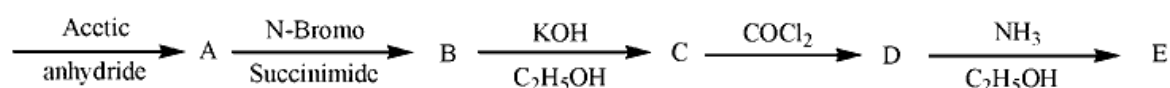


6. Resorcinol is treated with p-toluidine, the resulting product when reacted with 2-chloromethyl 2-imidazoline Hydrochloride gave product A.

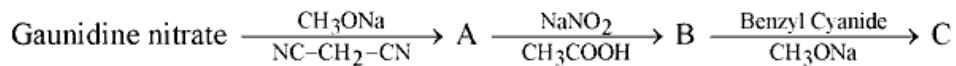
Write complete reaction sequence using appropriate structural formulae.

7. Complete the following reactions giving equations:

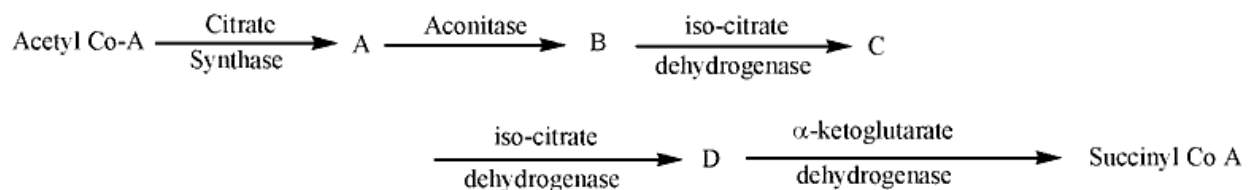
10-11 dihydro-5-H dibenz (b-f) azepine.



8. (a) Guanidine nitrate is treated as shown below. Product A B C are formed. What is the structural formula of Guanidine nitrate and the products A, B and C?



9. (a) In the formulation of liquid orals what are the four important criteria in the selection of a buffer?  
 (b) Define sustained release dosage forms in one sentence only.
10. List the I.P. tests to be complied by the plastic containers for ophthalmic preparations.
11. (a) Calculate the amount of sodium chloride required to make 1.5% solution of Pilocarpine Hydrochloride isotonic with tear secretion.  
 Freezing point of 1% solution of Pilocarpine Hydrochloride =  $-0.13^\circ\text{C}$   
 Freezing point of 1% solution of NaCl =  $-0.576^\circ\text{C}$
12. (a) Name one Pure short acting opioid antagonist  
 (b) Name the receptors which it blocks.  
 (c) Write the mechanism of action Ketorolac in one sentence only.  
 (d) Give one important therapeutic use of Ketorolac.  
 (e) Is Ketorolac associated with tolerance?
13. (a) Define pharmacokinetic interaction and pharmacodynamic interaction - in one sentence each.  
 (b) Comment in 3 sentences the interaction of allo-purinol and mercaptopurine.
14. Define natural killer cells, T cells, B cells cytokines and lymphokine - in one sentence each.
15. (a) Mention the organism from which streptomycin is isolated. <http://www.xamstudy.com>  
 (b) Give the name of the test organism used for its assay as per I.P.  
 (c) Write the structural formulae of three important hydrolytic products of streptomycin.
16. (a) Name the intermediates formed in A, B, C, D



- (b) Give the name of the pathway in which the above reactions occur.
17. Five common advices that are given to patients during administration of certain drugs are given below. Choose the appropriate drug [only one each] from the list.
- (a) Avoid milk products and Milk of magnesia half an hour before or after taking the medicine.  
 (b) Vitamin supplements containing pyridoxine should not be taken.  
 (c) Follow regular eating habits, especially immediately before and after taking this medicine.  
 (d) Do not worry about the reddish discolouration in the urine, sweat and saliva during the treatment.  
 (e) Take with an antacid.



- (i) Disprin                      (ii) Rifampicin                      (iii) Isoniazid                      (iv) Ampicillin  
 (v) Doxycycline                      (vi) L-dopa                      (vii) Ibuprofen                      (viii) Ranitidine  
 (ix) Insulin                      (x) Cetirizine

18. How do you characterize a biological inducator as per I.P.? Mention only five.
19. (a) To enhance response of a detector in liquid chromatography a modification to introduce a chromophore is done.  
 (i) What is it?  
 (ii) How is it classified?  
 (b) Name two cell materials used in I.R. for handling liquid samples.
20. (a) Define mass spectrum in one sentence only.  
 (b) Name the four types of electronic transitions involved in the ultraviolet spectroscopy.
21. (a) Name the titrants used in the I.P. assays for the following:  
 (i) Ascorbic acid  
 (ii) Ascorbic acid tablets  
 (iii) Ascorbic acid injection  
 (b) Name two instrumental methods used for determination of the concentration of the dispersed phase in a suspension.
22. (a) Write the heterocyclic ring system present in sulphomoxal.  
 (b) Give the half life equation for a zero order reaction.  
 (c) Define auxochrome in one sentence only.  
 (d) Which one of the following microorganisms is particularly dangerous to the eye?  
 (i) E.coli                      (ii) S.thermophilus                      (iii) Ps.aeruginosa  
 (e) Which one of the following drugs is used as an immuno-suppressant?  
 (i) Amantadine                      (ii) Cyclosporinee                      (iii) Tetracycline.

**End of paper**

**ANSWER KEY GATE 2000**

**Section - A**

1-b	2-a	3-c	4-a	5-a	6-c	7-a	8-d
8-d	9-a	10-a	11-b	12-c	13-a	14-b	15-d
16-b	17-d	18-b	19-c	20-c	21-b	22-d	23-c
24-a	25-d	26-a	27-d	28-b	29-d	30-c	31-b
32-a	33-a	34-c	35-c	36-a	37-a	38-d	39-a
40-a	41-b	42-a	43-c	44-a	45-b	46-b	47-c
48-d	49-a	50-c					

# GPAT QUESTION PAPER 1999 WITH ANSWER KEY

## PHARMACEUTICAL SCIENCE

Time : 3 hours

Maximum Marks : 150

Read the following instruction carefully.

1. All answers must be written only in the answer-book provided.
2. This question paper consists of **TWO SECTIONS** : Section 'A' and 'B'.
3. **Section A** consists of two questions of the multiple choice type. Question 1 consists of **TWENTY FIVE** sub-questions of **ONE** mark each and Questions 2 consists of **TWENTY FIVE** sub-question of **TWO** marks each.
4. The answers to the multiple type questions must be written only in the boxes provided in the sheet of the answer-book.
5. Answers to **Section B** should be started on a fresh page and should not be mixed with the answers to **Section A**. Question numbers must be written legibly and correctly in the answer-book.
6. Section B consists of **TWENTY** questions of **FIVE** marks each. Any **FIFTEEN** out of them have to be answered. If more number of questions are attempted, strike off the answer not to be evaluated, else only the first **FIFTEEN** unscored answers will be considered strictly.
7. In all questions of 5 marks, write, clearly the important steps in your answer. These steps carry partial credit.
8. There will be **NO NEGATIVE** marking.

### SECTION - A

- R1. (i) This question consists of 25 (Twenty five) multiple choice questions each carrying one mark.**  
**(ii) Choose the correct answer.**  
**(iii) Enter (a) or (b), (c) or (d) as the case may be in the boxes corresponding to the questions in the first page of the answer book.**
- 1.1. One of the following statements for adeny cyclase is wrong. Identify.
- |                                    |  |
|------------------------------------|--|
| (a) Is a membrane bound enzyme     | (b) Inactivated by Phosphodiesterase           |
| (c) Catalyses the A.M.P. formation | (d) Active only when associated with G Protein |
- 1.2 Which one of the following device is used to increase the efficiency of drug delivery via aerosols?
- |                  |              |                   |                    |
|------------------|--------------|-------------------|--------------------|
| (a) Tube spacers | (b) Actuator | (c) Metered valve | (d) Pressure valve |
|------------------|--------------|-------------------|--------------------|
- 1.3 One of the uses given below for opioids is not correct. Indicate
- |                 |               |                       |                    |
|-----------------|---------------|-----------------------|--------------------|
| (a) Antitussive | (b) Analgesic | (c) Anti-inflammatory | (d) Antidiarrhoeal |
|-----------------|---------------|-----------------------|--------------------|
- 1.4 Which one of the following is used as a preservative in ophthalmic preparations?
- |                           |                  |
|---------------------------|------------------|
| (a) Benzalkonium Chloride | (b) Phenol       |
| (c) Benzoic acid          | (d) Chlorocresol |

- 1.5 The activity of the following drugs is dependent on Pheny-N-alkyl one piperidine moiety?
- (a) Meperidine (b) Impipramine  
(c) Diazepam (d) Chlorpromazine
- 1.6 One of the organism mentioned below is used as a biological indicator in I.P. for ethylene oxide sterilization. Choose the correct one.
- (a) *Bacillus stearothermophilus* (b) Spores of *Bacillus subtilis*  
(c) *Bacillus pumilus* (d) Spores of *Bacillus cereus*
- 1.7 The most common causative agent of Bacterial Pneumonia is:
- (a) *Staphylococcus aureus* (b) *Escherichia coli*  
(c) *Streptococcus pneumoniae* (d) *Mycoplasma pneumoniae*
- 1.8 Creatinine clearance is used as a measurement for
- (a) Glomerular filtration rate (b) Renal excretion rate  
(c) Drug metabolism rate (d) Passive renal excretion
- 1.9 Choose the correct starting material for the synthesis of Ethacrynic Acid
- (a) 2, 3-Dichloro phenoxy acetic acid (b) 2, 3-Dibromo phenoxy acetic acid  
(c) 2, 3-Dichloro phenoxy propionic acid (d) 2, 3-Dichloro phenoxy butyric acid
- 1.10 Choose the correct metabolic process for Phenobarbitone
- (a) p-Hydroxylation followed by reduction (b) p-Hydroxylation followed by glucuronidation  
(c) p-Hydroxylation followed by acetylation (d) p-Hydroxylation followed by oxidation
- 1.11 Which one of the following antihistaminic is a basic ether?
- (a) Pheniramine Maleate (b) Triprolidine hydrochloride  
(c) Diphenhydramine hydrochloride (d) Promethazine hydrochloride
- 1.12 Conductivity cells are made up of
- (a) Two silver rods (b) Glass membrane with Ag/AgCl  
(c) Two parallel sheets of platinum (d) Sb-Sb<sub>2</sub>O<sub>3</sub>
- 1.13 The chemical shift value is
- (a) Proportional to field strength (b) Not proportional to field strength  
(c) Ratio of the number of Protons in each group (d) Proportional to the total number of protons
- 1.14 Select the equation that gives the rate of drug dissolution from a tablet
- (a) Fick's law (b) Henderson Hasselbatch equation  
(c) Noyes Whitney equation (d) Michelis Menten equation
- 1.15 Energy absorbed in U.V. region produces changes in
- (a) The rotational energy of the molecule (b) The vibrational energy of the molecule  
(c) The electronic energy of the molecule (d) All the three energy levels of the molecule
- 1.16 Dose dumping is a problem in the formulation of
- (a) Compressed tablets (b) Suppositories  
(c) Soft gelatin capsules (d) Controlled release drug products

1.17 The initial distribution of a drug into the tissue is determined chiefly by

- (a) Rate of blood flow to the tissue
- (b) Plasma protein binding of the drug
- (c) Affinity for the tissue
- (d) Stomach emptying time

1.18 Choose the correct characteristic of the epidermal cells and cuticle of *Atropa belladonna* leaf

- (a) Pitted walls with striated cuticle
- (b) Wavy walls with striated cuticle
- (c) Algal cell walls with smooth cuticle
- (d) Straight walls with wavy cuticle

1.19. Meclizine hydrochloride is prepared from which one of the following?

- (a) 1-(4-chloro benzhydriyl)-Pyridine and 3-methyl benzaldehyde
- (b) 1-(2-chloro benzhydriyl)-Piperazine and 3-methyl benzaldehyde
- (c) 1-(4-chloro benzhydriyl)- Piperazine and 3-methyl benzaldehyde
- (d) 1-(4-chloro benzhydriyl)- Piperazine and 2-methyl benzaldehyde

1.20. Which one of the following is an Ex-Officio member of the State Pharmacy Council?

- (a) Chief Pharmacist of Government hospital <http://www.xamstudy.com>
- (b) Chief Administrative Medical Officer of the state
- (c) Registered Pharmacist
- (d) Assistant Drug Controller

1.21. Phloroglucinol and Hydrochloric acid produces pink or red colour with

- (a) Cellulose cell walls
- (b) Lignified cell walls
- (c) Cutinized cell walls
- (d) Mucilaginous cell walls

1.22. One of the forms mentioned below is used to issue licence for wholesale of drugs other than specified in schedule C, C<sub>1</sub> and X. Choose the correct one.

- (a) 20.B
- (b) 20 B.B
- (c) 21 B
- (d) 20 A

1.23. Choose the correct chemical name for Chlorpromazine hydrochloride

- (a) [3-(2-chlorophenothiazin-10-yl) propyl] diethylamine hydrochloride
- (b) [2-(3-chlorophenothiazin-10-yl) propyl] diethylamine hydrochloride
- (c) [3-(2-chlorophenothiazin-10-yl) propyl] diethylamine hydrochloride
- (d) [3-(3-chlorophenothiazin-10-yl) propyl] diethylamine hydrochloride

1.24. Wavelength of a radiation is 5.0  $\mu$ . Wave number corresponding to that is:

- (a) 4000  $\text{cm}^{-1}$
- (b) 2000  $\text{cm}^{-1}$
- (c) 3000  $\text{cm}^{-1}$
- (d) 1000  $\text{cm}^{-1}$

1.25 Choose the synthetic adrenocortical steroid, which do not occur in nature.

- (a) 11 $\beta$ , 17 $\alpha$ , 21-Trihydroxy-1, 4-pregnadiene-3, 20-dione
- (b) 17 $\alpha$ , 21-Dihydroxy pregna-4-ene-3, 11, 20-trione
- (c) 11 $\beta$ , 17 $\alpha$ , 21-Trihydroxy pregna-4-ene-3,20-dione
- (d) 3-oxo-17 $\beta$ , Hydroxy androst-4-ene.

R2. Match each of the items 1 and 2 on the left with an appropriate item on the right [A,B,C,D] and answer in the specific space provided in the answer book.

2.1 Match the correct heterocyclic system present in the medicinal agents given in (A) to (D).

- |  |                    |              |              |
|--|--------------------|--------------|--------------|
| (1) 5H Dibenzo (b-f) azepine             | (A) Nitrazepam     |              |              |
| (2) 1, 4-Dihydro-1,8-Naphthyridine-4-one | (B) Carbamazepine  |              |              |
|  | (C) Imipramine     |              |              |
|  | (D) Nalidixic acid |              |              |
| (a) 1-B, 2-D                             | (b) 1-A, 2-B       | (c) 1-C, 2-A | (d) 1-A, 2-D |

2.2. Match the titrants used for the following:

- |                         |                                    |              |              |
|-------------------------|------------------------------------|--------------|--------------|
| (1) Paracetamol I.P.    | (A) Perchloric acid                |              |              |
| (2) Phenytoin sold-I.P. | (B) EDTA                           |              |              |
|                         | (C) Ceric ammonium sulphate        |              |              |
|                         | (D) Tetra butyl ammonium hydroxide |              |              |
| (a) 1-B, 2-D            | (b) 1-A, 2-B                       | (c) 1-C, 2-A | (d) 1-A, 2-D |

2.3. Starting material for the synthesis of medicinal agents are listed below. Match them with the correct ones from (A) to (D).

- |                                      |                       |              |              |
|--------------------------------------|-----------------------|--------------|--------------|
| (1) 2-Amino-5-chloro-benzophenone    | (A) Ethosuximide      |              |              |
| (2) Butanone and ethyl cyano acetate | (B) Diazepam          |              |              |
|                                      | (C) Prochloroperazine |              |              |
|                                      | (D) Propranolol       |              |              |
| (a) 1-B, 2-A                         | (b) 1-A, 2-B          | (c) 1-C, 2-A | (d) 1-A, 2-D |

2.4. The ring structures present in the alkaloids listed below are given in (A) to (D). Match them.

- |                |                   |              |              |
|----------------|-------------------|--------------|--------------|
| (1) Codeine    | (A) Phenanthrene  |              |              |
| (2) Ergotamine | (B) Indole        |              |              |
|                | (C) Quinoline     |              |              |
|                | (D) Iso-quinoline |              |              |
| (a) 1-B, 2-D   | (b) 1-B, 2-A      | (c) 1-C, 2-A | (d) 1-A, 2-D |

2.5. The following terms are used to describe the parts of certain plants listed in (A) to (D). Match them.

- |                |                                   |              |              |
|----------------|-----------------------------------|--------------|--------------|
| (1) Hypanthium | (A) Prunus communis               |              |              |
| (2) Rhytidoma  | (B) Cinnamon bark                 |              |              |
|                | (C) Roots of Rauwolfia serpentine |              |              |
|                | (D) Eugenia caryophyllus          |              |              |
| (a) 1-D, 2-B   | (b) 1-A, 2-B                      | (c) 1-C, 2-A | (d) 1-A, 2-D |

2.6. The chief active constituents of some umbrelliferous fruits are listed in (A) to (D). Match them with the correct source.

- |                                   |              |              |              |
|-----------------------------------|--------------|--------------|--------------|
| (1) <i>Foeniculum capillaceum</i> | (A) Anethol  |              |              |
| (2) <i>Anethum graveolens</i>     | (B) Carvone  |              |              |
|                                   | (C) Khellin  |              |              |
|                                   | (D) Linalol  |              |              |
| (a) 1-B, 2-D                      | (b) 1-A, 2-B | (c) 1-C, 2-A | (d) 1-A, 2-B |



2.7. Some substances used in tablet coating process are given. Match them with their correct use mentioned in (A) to (D).

- |                                     |                  |              |              |
|-------------------------------------|------------------|--------------|--------------|
| (1) Shellac                         | (A) Polishing    |              |              |
| (2) Hydroxy propyl methyl cellulose | (B) Seal coating |              |              |
|                                     | (C) Film former  |              |              |
|                                     | (D) Sub-coating  |              |              |
| (a) 1-B, 2-C                        | (b) 1-A, 2-B     | (c) 1-C, 2-A | (d) 1-A, 2-D |

2.8. Some materials used in the manufacture of pharmaceutical dosage forms are given. Match them with correct use mentioned in (A) to (D).

- |                      |  |              |              |
|----------------------|--|--------------|--------------|
| (1) Sorbitol         | (A) Preservative for capsules            |              |              |
| (2) Titanium dioxide | (B) Plasticizer in soft gelatin capsules |              |              |
|                      | (C) Lubricant for tablets                |              |              |
|                      | (D) Opacifier for gelatin mass           |              |              |
| (a) 1-B, 2-D         | (b) 1-A, 2-B                             | (c) 1-C, 2-A | (d) 1-A, 2-D |

2.9. Given below are the aerosol systems. Match them with their correct propellants given in (A) to (D).

- |                             |                                  |
|-----------------------------|----------------------------------|
| (1) Aerosol for oral use    | (A) Propane                      |
| (2) Aerosol for topical use | (B) Oxygen                       |
|                             | (C) Methane                      |
|                             | (D) Trichloro-monofluoro methane |
| (a) 1-B, 2-D                | (b) 1-D, 2-A                     |
| (c) 1-C, 2-A                | (d) 1-A, 2-D                     |

2.10. Some of the applications for immobilized enzyme systems are given below. Match with the process listed in (A) to (D).

- |                          |   |
|--------------------------|---|
| (1) Amino cyclase        | (A) N-oxidation of drugs containing Hydrazine |
| (2) Flavoprotein oxidase | (B) Resolution of DL-amino acid               |
|                          | (C) D-amino acid production                   |
|                          | (D) Nucleotide production from RNA            |
| (a) 1-B, 2-D             | (b) 1-D, 2-B                                  |
| (c) 1-C, 2-A             | (d) 1-A, 2-D                                  |

2.11. Systematic chemical names of the medicinal agents are given in (A) to (D). Match them.

- |                    |  |
|--------------------|--|
| (1) Indomethacin   | (A) 13 $\beta$ -methyl-17 $\beta$ hydroxyl -18, 19 dinor-17 $\alpha$ -Pregn-4-en-20 yn-3-one |
| (2) Levonorgestrol | (B) 13 $\beta$ -methyl-17 $\alpha$ hydroxyl-18 nor-17- $\alpha$ -Pregn-4-en-20 yn-3- one     |
|                    | (C) 1-(2-chloro benzyl)-5-ethoxy-2-methyl indolyl-3-yl, acetic acid                          |
|                    | (D) 1-(4 chloro benzoyl)-5-methoxy 2-methyl indol-3-yl, acetic acid                          |

- (a) 1-D, 2-A      (b) 1-A, 2-B      (c) 1-C, 2-A      (d) 1-A, 2-D

2.12. Storage conditions as per I.P. for different preparations are given. Match them with the correct temperature prescribed.

- |              |   |
|--------------|---|
| (1) Cold     | (A) Between 20°C and 8°C                  |
| (2) Warm     | (B) Below 20°C                            |
|              | (C) Any temperature between 30°C and 40°C |
|              | (D) Above 40°C                            |
| (a) 1-B, 2-C | (b) 1-A, 2-B                              |

2.13. The wave lengths of two different regions of the electromagnetic spectrum are given from (A) to (D). Match them.

- |                         |                               |
|-------------------------|-------------------------------|
| (1) Finger print region | (A) 2.5 to 8.0 $\mu\text{m}$  |
| (2) Visible region      | (B) 8.0 to 15.0 $\mu\text{m}$ |
|                         | (C) 0.2 to 0.35 $\mu\text{m}$ |
|                         | (D) 0.4 to 0.8 $\mu\text{m}$  |
| (a) 1-B, 2-D            | (b) 1-A, 2-B                  |
| (c) 1-C, 2-A            | (d) 1-A, 2-D                  |

2.14. Match the correct applications mentioned in (A) - (D) with the two equations.

- |                      |                       |
|----------------------|-----------------------|
| (1) Nernst equation  | (A) Potential         |
| (2) Ilkovic equation | (B) Migration current |
|                      | (C) Diffusion current |
|                      | (D) Conductance       |
| (a) 1-B, 2-D         | (b) 1-A, 2-B          |
| (c) 1-A, 2-C         | (d) 1-A, 2-D          |

2.15. Certain drug combinations are given below. Match them with the correct drug interaction given in (A) to (D).

- |                                  |  |
|----------------------------------|--|
| (1) Phenobarbitone and Digitoxin | (A) Induction of Hepatic Microsomal enzyme under digitalization            |
| (2) Aspirin and Methotrexate     | (B) Potentiation of the activity of Digitalis                              |
|                                  | (C) Less absorption of Methotrexate  |
|                                  | (D) Displacement of Protein Binding site-increase toxicity of Methotrexate |
| (a) 1-B, 2-D                     | (b) 1-A, 2-B   |
| (c) 1-C, 2-A                     | (d) 1-A, 2-D   |

2.16. Mechanism of action of drugs listed below are given (a) to (D). Match them.

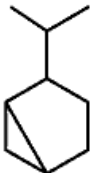
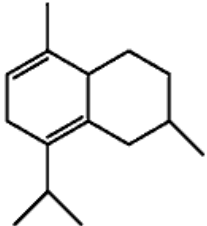
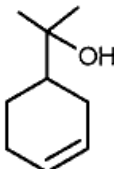
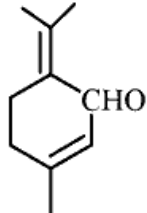
- |                           |   |
|---------------------------|---|
| (1) $\alpha$ -Methyl Dopa | (A) Multiple sites including $\alpha_2$ agonism |
| (2) Minoxidil             | (B) Catecholamine release                       |
|                           | (C) Sympathetic neuronal block                  |
|                           | (D) Non-selective vasodilation                  |



2.22. Two types of detectors are given below. Match them with the instrument given in (A) to (D).

- |                               |                          |
|-------------------------------|--------------------------|
| (1) Flame ionization detector | (A) IR Spectrophotometer |
| (2) Golay pneumatic detector  | (B) UV Spectrophotometer |
|                               | (C) Flame photometer     |
|                               | (D) Gas chromatograph    |
| (a) 1-D, 2-A                  | (b) 1-A, 2-B             |
| (c) 1-C, 2-A                  | (d) 1-A, 2-D             |

2.23. Appropriate structural formulae for Monocyclic monoterpene and Bicyclic monoterpene are given in (A) to (D). Match them.

- |                            |  |  |
|----------------------------|--|--|
| (1) Monocyclic monoterpene | (A)   | (B)   |
| (2) Bicyclic monoterpene   | (C)  | (D)  |
| (a) 1-B, 2-D               | (b) 1-A, 2-B   |  |
| (c) 1-C, 2-A               | (d) 1-A, 2-D   |  |

2.24. Two methods of sterilization are given for the materials listed from (A) to (D). Match them correctly.

- |                          |                           |
|--------------------------|---------------------------|
| (1) Dry heat             | (A) Rooms                 |
| (2) $\gamma$ - radiation | (B) Plastic syringes      |
|                          | (C) Takum powder          |
|                          | (d) Intravenous admixture |
| (a) 1-B, 2-D             | (b) 1-A, 2-B              |
| (c) 1-C, 2-B             | (d) 1-A, 2-D              |

2.25. Listed are some of the microscopical characters of bark powder obtained from the plants mentioned in (A) to (D). Match them.

- |   |                                      |              |              |
|---|--------------------------------------|--------------|--------------|
| (1) Narrow slender lignified phloem fibres occur singly or tangential rows of 2-5, Lignified, colourless narrow sub rectangular parenchyma with small starch grains. Less amount of cork. | (A) <i>Cinchona succirubra</i>       |              |              |
| (2) Wider phloem fibres, Larger-Starch grains<br>Longer fibres abundant cork  | (B) <i>Cinnamomum zeylanicum</i>     |              |              |
|   | (C) <i>Cinnamomum cassia</i>         |              |              |
|   | (D) <i>Holarrhena antidysentrica</i> |              |              |
| (a) 1-C, 2-D  | (b) 1-A, 2-B                         | (c) 1-C, 2-A | (d) 1-A, 2-D |

## SECTION - B

*This section consists of 20 (TWENTY) questions of 5 (FIVE) marks each. Attempt ANY 15 (FIFTEEN) questions. Answers must be given in the answer book provided. Answer for each question must start on a fresh page and must appear at one place only.*

3. Draw the structures of Anthraquinone, Oxanthrone, Anthranol Anthrone and Dianthrone.
4. Starting from m-chloroaniline, draw a scheme for the preparations of chlorothiazide and then to hydrochlorothiazide. Give the structural formulae of all reactants, reagents and products.
5. Write complete equations for the following reaction:
  - (a) [1-(4 hydroxy phenyl)-2-amino propanol] + 1-phenoxy-2-propyl bromide  $\rightarrow$
  - (b) What is the common name of the medicinal agent formed?
  - (c) To which pharmacological category it can be included
6. (a) Complete the following synthesis by writing the full equation:
 
$$\text{Ethyl-}\alpha\text{-hydroxy-}\alpha\text{-methyl Propionate} + \text{Urea} \xrightarrow{\text{C}_2\text{H}_5\text{ONa}} (2) \dots \xrightarrow{(\text{CH}_3\text{O})_2\text{SO}_2} \dots (3) \dots$$
  - (b) Streptomycin acts as a triacidic base - which groups are responsible for this.
7. Draw the structural formulae of the products obtained at 1,2, 3, 4 and 5.
 
$$\text{Phthalic anhydride} \xrightarrow{\text{Zn}} (1) \dots \xrightarrow[\text{H}_2\text{O}]{\text{Cl}_2} (2) \dots \xrightarrow{\text{H}_2\text{N}\cdot\text{NH}_2\cdot\text{H}_2\text{O}} (3) \dots \xrightarrow{\text{POCl}_3} (4) \dots$$

$$\xrightarrow{\text{H}_2\text{N}\cdot\text{NH}_2\cdot\text{H}_2\text{O}} (5) \dots$$
8. (a) What is cell constant? How is it determined?  
 (b) Give the reason for the following:
  - (i) In conductometric titration the titrant should be at least ten times as concentrated as the solution being titrated. <http://www.xamstudy.com>
  - (ii) Temperature control is important in conductometric titrations.
9. (a) Define [Answer each in one or two sentences only]
 

(a) Palisade ratio	(b) Stomatal number
(c) Stomatal index	(d) Vein islet number
(e) Vein islet termination number	
10. (a) Name the types of Stomata present in the following medicinal plants:
 

(i) <i>Digitalis purpurea</i> leaves	(ii) <i>Datura stramonium</i> leaves
(iii) <i>Cassia acutifolia</i> leaves	(iv) <i>Mentha piperita</i>

  - (b) Give the murexide test for detecting purine derivatives.





21. In the microbiological assay of Bacitracin I.P, mention:
- (i) Method adopted
  - (ii) Organism used
  - (iii) pH of the media
  - (iv) Incubation time
  - (v) Incubation temperature
22. (a) Give three methods of record the IR spectra of solids.  
 (b) Name two ways (phases) by which partition chromatography can be conducted.

**End of paper**

**ANSWER KEY GATE 1999**

**Section - A(R1)**

1.1	d	1.2	a	1.3	c	1.4	a
1.5	a	1.6	b	1.7	c	1.8	a
1.9	a	1.10	b	1.11	c	1.12	b
1.13	a	1.14	c	1.15	d	1.16	d
1.17	a	1.18	b	1.19	c	1.20	b
1.21	b	1.22	a	1.23	c	1.24	b
1.25	a						

**Section - A(R2)**

2.1	a	2.2	c	2.3	a	2.4	b
2.5	a	2.6	d	2.7	a	2.8	a
2.9	b	2.10	b	2.11	a	2.12	a
2.13	a	2.14	c	2.15	d	2.16	d
2.17	b	2.18	a	2.19	b	2.20	c
2.21	d	2.22	a	2.23	c	2.24	c
2.25	a						

# GPAT QUESTION PAPER 1998 WITH ANSWER KEY

## PHARMACEUTICAL SCIENCE

Time : 3 hours

Maximum Marks : 200

Read the following instruction carefully.

1. Write all the answer in the answer book.
2. This question paper consists of **TWO SECTIONS : A and B.**
3. **Section A** has Seven questions. Answer ALL questions in this section.
4. Answer Question No. 1 and 2 in the specific columns provided in the answer book.
5. **SECTION B** has Twenty questions. Answer any **TEN** questions. Strike off the answer which are not to be evaluated; else only the first ten answers will be considered.
6. Answer to **Section B** should start on a fresh page and should not be mixed with answer to **Section A.**
7. Answer to questions and answers to parts of a question should appear together and should not be separated.
8. In all questions of 5 marks. write, clearly the important steps in your answer. These steps carry partial credit.
9. There will be no negative marking.
10. Read specific instructions given if any, in the individual section.

### SECTION - I

- R1.** (1) Answer all questions in this section.  
(2) Answer question No.1 and 2 in the specific columns provide in the answer book.
- 1.1. The opium alkaloids in *Papaver somniferum* is present as one of the following. Identify.
- |                             |                             |
|-----------------------------|-----------------------------|
| (a) Free alkaloids          | (b) As salts of citric acid |
| (c) As salt of meconic acid | (d) None of these           |
- 1.2. In expressing vitamin A activity one of the following is true. Identify.
- |   |
|---|
| (a) One RE represents the biological activity in 1 $\mu$ g of all trans retinol     |
| (b) One RE represents the biological activity of 30 mg of all trans retinol         |
| (c) One RE represents the biological activity of 0.334 $\mu$ g of all trans retinol |
| (d) None of the above   |
- 1.3. Which of the antineoplastic agent is metabolised by xanthine oxidase?
- |                      |                   |
|----------------------|-------------------|
| (a) 6-Mercaptopurine | (b) Vincristine   |
| (c) Chlorambucil     | (d) 6-Thioguanine |

1.5. The energy of a photon is given by the relationship  $E = hv$ , where

- (a) E is energy of photon in kilo-calories
- (b) E is energy of photon in cycles/sec
- (c) E is the energy of photon in joules
- (d) E is the energy of photon in ergs

1.6. Gas chromatographic technique can be used for

- (a) Qualitative analysis only
- (b) Quantitative analysis only
- (c) Both
- (d) None of these

1.7. Reference compound widely used in NMR spectroscopy for proton spectra in non-aqueous medium is:

- (a) Silane
- (b) Tetramethyl Silane
- (c) Dpph
- (d) Peroxylamide Di Sulphonate

1.8. Liposomes are

- (a) Uni or multilayered vesicles of phospholipids
- (b) Type of enzymes
- (c) Fibrinopeptides
- (d) Red blood cells

1.9. The gonadal hormones like Estrogens, Androgens and Progestins bind with

- (a) Receptors located in the cytoplasm
- (b) Receptors located in the nucleus of the cell
- (c) Receptors located in the contractile vacuoles
- (d) None of the above

1.10 A highly sensitive semi quantitative method of detecting microbial antigens in biological fluid is:

- (a) Counter immune electrophoresis
- (b) Nitroblue tetrazolium dye assay
- (c) The Coomb's test
- (d) Radio-immune electrophoresis

1.11 Polyene antibiotics such as Amphotericin - B are most likely to

- (a) Inhibit bacterial DNA synthesis
- (b) Bind to prokaryotic ribosomes
- (c) Act as antimetabolites
- (d) React with sterols in the membrane

1.12 Among the following statements one of them is most appropriate for  $\gamma$  - Interferon. Identify.

- (a) They are virus specific substances and not host specific, naturally occurring glycol-proteins.
- (b) They are not virus specific substances, however, they are naturally occurring glycol-proteins.
- (c) They are not virus specific substances, however they are not host specific either. They are naturally occurring glycol-proteins.
- (d) They are virus specific and host specific naturally occurring glycoproteins.

1.13 The tear secretion contains an antibacterial enzyme known as

- (a) Zymase
- (b) Diastase
- (c) Lysozyme
- (d) Lipase

1.14 A list of ACE inhibition is given below. One of them is not a Prodrug. Identify.

- (a) Benzepiril
- (b) Captopril
- (c) Quinapril
- (d) Ramipril

1.15 Which one of the following is not a pharmacological effect of MORPHINE?

- (a) Constriction of the pupil
- (b) C.N.S. depression
- (c) Diarrhoea
- (d) Respiratory

1.16 Half life equation for First order reaction is:

- (a)  $\frac{t}{2} = \frac{a}{2K}$
- (b)  $\frac{t}{2} = \frac{0.693}{K}$
- (c)  $\frac{t}{2} = \frac{1}{aK}$
- (d)  $\frac{t}{2} = \frac{3}{2} \frac{1}{a^2K}$

1.17 Which one of the following is true for alkaloidal bases?

- (a) Water solubility and organic solvent insolubility.
- (b) Water insolubility and organic solvent insolubility.
- (c) Water solubility and organic solvent solubility
- (d) Water insolubility and organic solvent solubility

1.18 The conductivity of the solution of an electrolysis is:

- (a) Non temperature dependent
- (b) Temperature dependent
- (c) Pressure dependent
- (d) None of these

1.19. One of the materials listed below is most commonly used in film coating of tablets. Identify.

- (a) Hydroxypropyl Methyl Cellulose
- (b) Acacia
- (c) Simple Syrup
- (d) Bees Wax

1.20. Lamination is:

- (a) Separation of a tablet into two or more distinct layers
- (b) Partial and complete separation of the top and bottom crowns of a tablet from the main body of the tablet <http://www.xamstudy.com>
- (c) Process of sub-coating of tablets
- (d) None of the above

1.21. Among the four OPIOIDS given below one of them is equipotent on  $\mu$ ,  $\delta$ ,  $k_1$  and  $k_3$  receptor types. Identify.

- (a) Fentanyl
- (b) Methadone
- (c) Morphine
- (d) Etorphine

1.22. An amperometric titration which one of the following is kept constant?

- (a) Current
- (b) Resistance
- (c) Voltage Applied
- (d) Conductance

1.23. Disposable syringes are made up of

- (a) Polypropylene
- (b) Transparent Polystyrene
- (c) Glass
- (d) Poly Tetra Chloro Ethylene

1.24. Typhoid vaccine IP is a sterile suspension or a freeze dried solid prepared from

- (a) *Salmonella Typhi* Murium
- (b) *Salmonella Para Typhi*
- (c) *Salmonella Typhi*
- (d) *Salmonella Enteritidis*

1.25 In the microbiological assay of bacitracin  $\alpha$  IP the test organism used is

- (a) *Staphylococcus Aureus*
- (b) *Staphylococcus Epidermidis*
- (c) *Micrococcus Luteus*
- (d) *Bacillus Pumilus*

1.26. In the general formula R-X-C-N : X= Nitrogen, or Carbon, R = Different groups. This formula represents

- (a) Antitussive
- (b) Antipyretics
- (c) Analgesics
- (d) Antihistamines

1.27. The biological source of cinnamon bark is:

- (a) Dried inner bark of the shoot of coppiced trees of *Cinnomomum zeylanicum* Family – Lauraceae
- (b) Dried inner bark of the shoot of coppiced trees of *Cinnomomum indicum* Family – Lauraceae
- (c) Dried wood bark of *Cinnomomum Camphora* Family – Lauraceae
- (d) Dried inner bark of the shoot of coppiced trees of *Cinnomomum loureirii* Family – Lauraceae



1.28. Identify the correct Geneva name for CORTISONE.

- (a) 4 - Pregnene 17 $\alpha$ , 21 - diol - 3, 11, 20 - trione
- (b) 3 - Pregnene 17 $\alpha$ , 21 - diol - 3, 11, 20 - trione
- (c) 4 - Pregnene 11 $\beta$ , 17 $\alpha$ , 21 triol - 3, 11, 20 - dione
- (d) 4 - Pregnene 12 $\beta$ , 17 $\alpha$ , 21 - triol - 3, 20 - dione

1.29. Identify one of the carbonic anhydrase inhibitors that inhibit only luminal carbonic anhydrase enzyme?

- (a) Methazolamide
- (b) Acetazolamide
- (c) Dichlorphenamide
- (d) Benzolamide

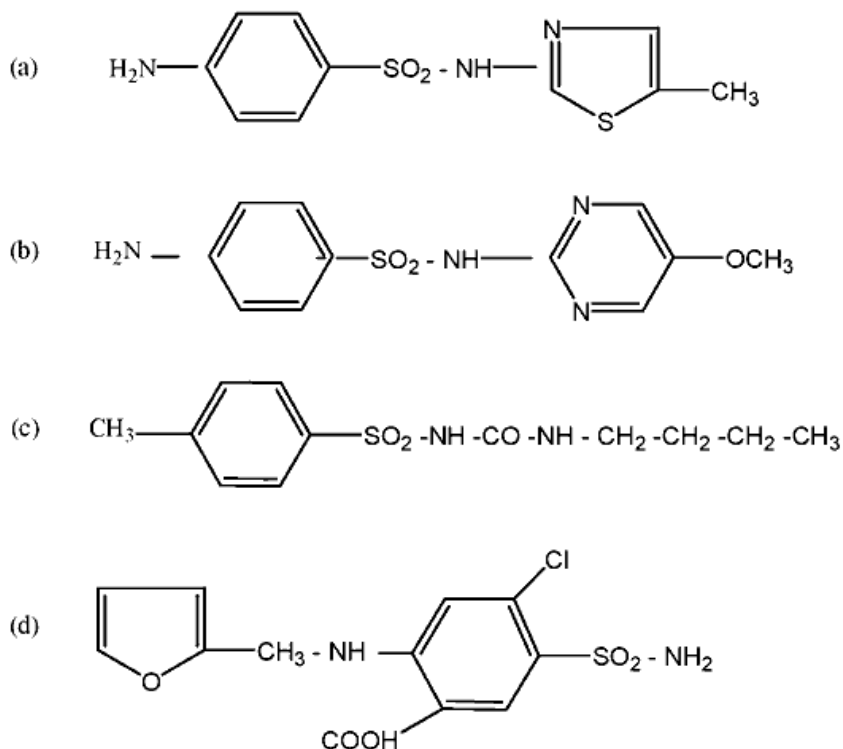
1.30. Testosterone is rapidly converted to one of the following metabolic products in many tissues, which is the active androgen?

- (a) 5- $\beta$ -Dihydro Testosterone
- (b) 5-OH-Testosterone
- (c) 5- $\alpha$ -Dihydro Testosterone
- (d) 5 $\alpha$ , 6 $\beta$ -OH-Testosterone

1.31. One of the following drugs is an alkylating agent. Identify.

- (a) Cyclophosphamide
- (b) Methotrexate
- (c) Allopurinol
- (d) Rifampicin

1.32. Listed below are structures of sulphonamides. Which one of them is used as an anti-diabetic drug?



1.33. Four sets of intermediates are listed below. Choose the correct set for the synthesis of BUPIVACAINE IP.

- (a)  $\alpha$  -Picolinic Acid Chloride with 2, 6-Diethyl Aniline.
- (b)  $\beta$  -Picolinic Acid Chloride with 2, 6-Diethyl Aniline.
- (c)  $\alpha$  -Picolinic Acid Chloride with Aniline Hydrochloride.
- (d)  $\alpha$  -Picolinic Acid Chloride with 2, 6-Di Methyl Aniline.

1.34. Among the immunizing agents listed below one of them is orally administered. Identify.

- (a) Tetanus Toxoid (b) Rabies Vaccine  
(c) Poliomyelitis Vaccine (d) Mumps Virus Vaccine

1.35. In vitro dissolution rate studies on drug product are useful in bioavailability evaluations if they are correlated with

- (a) Disintegration rate  
(b) In-vivo studies in at least three species of animals  
(c) The chemical stability of the drug  
(d) In-vivo studies in human

## SECTION - II

2. In the following sub-questions match each of the items 1 and 2 on the left with an appropriate item on the right [A, B, C, D] and write in the specific space provided in the answer book.

2.1 The mechanism of action of antiviral drugs is given. Match with closely associated drugs given in (A) to (D).

- (1) Inhibit an early step in viral replication viral uni-coating (A) Amantadine  
(2) Irreversible inactivation of DNA Polymerase (B) Methisazone  
(C) Rifampin  
(D) Acyclovir

- (a) 1-A, 2-C (b) 1-B, 2-C (c) 1-A, 2-D (d) 1-B, 2-D

2.2. Given below are the etiologic agents. Match with common name of the infection listed in (A) to (D):

- (1) Enterobius vermicularis (A) Tape worm  
(2) Taenia saginata (B) Pin worm  
(C) Round worm  
(D) Hook worm

- (a) 1-C, 2-A (b) 1-B, 2-C (c) 1-A, 2-D (d) 1-B, 2-D

2.3. The substance mentioned below elicit the therapeutic effect given in (A) to (D):

- (1) Hepatitis B. Immuno globulin antibodies (A) Induce active long term immunity in host cells  
(2) Tetanus Toxoid (B) Induce functional differentiation  
(C) Provide transfer of passive immunity  
(D) Provide short term non-specific bactericidal effect

- (a) 1-A, 2-C (b) 1-C, 2-A (c) 1-A, 2-D (d) 1-B, 2-D

2.4. The following glycosides of *Digitalis Purpurea* give on hydrolysis the genus and sugars listed in (A) to (D). Match them.

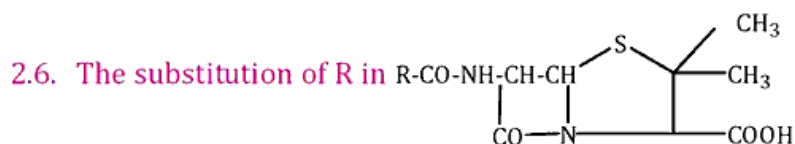
- |                          |  |
|--------------------------|--|
| (1) Purpurea Glycoside-A | (A) 1, 3, 5 - 11 $\alpha$ 19-hexahydroxy cardenolide + Glucose + Digitoxose            |
| (2) Purpurea Glycoside-B | (B) 3 $\beta$ , 14 $\beta$ - dihydroxy cardenolide + Glucose + Digitoxose              |
|                          | (C) 3 $\beta$ , 14 $\beta$ , 16 $\beta$ - trihydroxycardenolide + Glucose + Digitoxose |
|                          | (D) 3 $\beta$ , 12 $\beta$ , 14 $\beta$ - trihydroxycardenolide + Glucose + Digitoxose |

- |              |              |
|--------------|--------------|
| (a) 1-A, 2-C | (b) 1-B, 2-C |
| (c) 1-A, 2-D | (d) 1-B, 2-D |

2.5. Listed are some important antibiotics (A) to (D). match them.

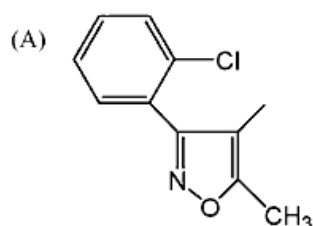
- |                  |                                      |
|------------------|--------------------------------------|
| (1) Bacitracin   | (A) From several amino acids         |
| (2) Erythromycin | (B) From single amino acids          |
|                  | (C) From acetate or propionate units |
|                  | (D) From sugars                      |

- |              |              |
|--------------|--------------|
| (a) 1-A, 2-C | (b) 1-B, 2-C |
| (c) 1-A, 2-D | (d) 1-B, 2-D |

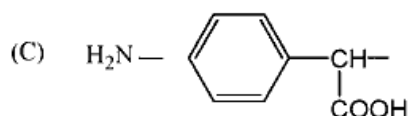
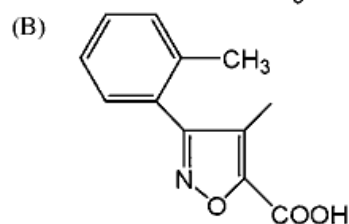


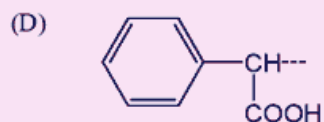
is listed in A to D for the following antibiotics. Match Them:

(1) CLOXACILLIN



(2) CARBENICILLIN





- (a) 1-A, 2-C                      (b) 1-B, 2-C                      (c) 1-A, 2-D                      (d) 1-B, 2-D

2.7. Some of the vitamins listed below are associated with co-enzyme given in (A) to (D). Match them.

- |                    |                |
|--------------------|----------------|
| (1) Nicotinic Acid | (A) Coenzyme A |
| (2) Riboflavin     | (B) Coenzyme I |
|                    | (C) TPP        |
|                    | (D) FAD        |

- (a) 1-A, 2-C                      (b) 1-B, 2-C                      (c) 1-A, 2-D                      (d) 1-B, 2-D

2.8. Listed are some tablets additives. Match them with their correct use given in (A) to (D).

- |             |               |
|-------------|---------------|
| (1) Acacia  | (A) Binder    |
| (2) Lactose | (B) Glidant   |
|             | (C) Diluent   |
|             | (D) Lubricant |

- (a) 1-A, 2-C                      (b) 1-B, 2-C                      (c) 1-A, 2-D                      (d) 1-B, 2-D

2.9. The compounds listed are assayed by method given (A) to (D). Match them.

- |                                  |                           |
|----------------------------------|---------------------------|
| (1) Pyridoxine Hydrochloride I.P | (A) Colorimetry           |
| (2) Ranitidine Hydrochloride     | (B) H P L C               |
|                                  | (C) Fluorimetry           |
|                                  | (D) Non aqueous titration |

- (a) 1-A, 2-C                      (b) 1-B, 2-C                      (c) 1-A, 2-D                      (d) 1-D, 2-B

2.10. The following techniques are associated with the support materials used in the column which are given in (A) to (D). Match them.

- |                                   |  |
|-----------------------------------|--|
| (1) Size exclusion chromatography | (A) Octadecyl silane chemically bounded to Porous silica |
| (2) H P L C                       | (B) Cellulose acetate                                    |
|                                   | (C) Diatomaceous support                                 |
|                                   | (D) Agarose F.C.   |

- (a) 1-B, 2-A                      (b) 1-B, 2-C                      (c) 1-A, 2-D                      (d) 1-B, 2-D

2.11. For the following potentiometric titrations indicator electrode used is given from (A) to (D). Match them.

- |                   |                               |
|-------------------|-------------------------------|
| (1) Acid base     | (A) Silver electrode          |
| (2) Complexometry | (B) Glass electrode           |
|                   | (C) Platinum electrode        |
|                   | (D) Mercury-Mercury electrode |

- (a) 1-A, 2-C                      (b) 1-B, 2-C                      (c) 1-A, 2-D                      (d) 1-B, 2-D

2.12. Following ring systems are present in the alkaloids listed (A) to (D). Match them.

- |                  |                 |              |              |
|------------------|-----------------|--------------|--------------|
| (1) Imidazole    | (A) PELLETERINE |              |              |
| (2) Isoquinoline | (B) Nicotine    |              |              |
|                  | (C) Papaverine  |              |              |
|                  | (D) Pilocarpine |              |              |
| (a) 1-D, 2-C     | (b) 1-B, 2-C    | (c) 1-A, 2-D | (d) 1-B, 2-D |

2.13. Following constituents are present in drugs listed in (A) to (D). Match them.

- |                |                         |              |              |
|----------------|-------------------------|--------------|--------------|
| (1) D-Linalool | (A) Opium               |              |              |
| (2) Panaxadiol | (B) Coriandrum sativium |              |              |
|                | (C) Ginseng             |              |              |
|                | (D) Brahmi              |              |              |
| (a) 1-A, 2-C   | (b) 1-B, 2-C            | (c) 1-A, 2-D | (d) 1-B, 2-D |

2.14. Systematic name of the following biologically important purines are given in (A) to (D). Match them correctly.

- |              |                                       |              |              |
|--------------|---------------------------------------|--------------|--------------|
| (1) Adenine  | (A) 2-amino-6-oxo purine              |              |              |
| (2) Guanine  | (B) 6-amino purine                    |              |              |
|              | (C) 1, 3, 7-dimethyl 6-hydroxy purine |              |              |
|              | (D) 6-hydroxy purine                  |              |              |
| (a) 1-D, 2-A | (b) 1-B, 2-C                          | (c) 1-A, 2-D | (d) 1-B, 2-D |

2.15. The drugs mentioned below are synthesized from intermediates listed in (A) to (D). Match them.

- |                 |   |              |              |
|-----------------|---|--------------|--------------|
| (1) Meprobamate | (A) 2-chloro-5-amino benzophenone and glycine         |              |              |
| (2) Diazepam    | (B) 2-amino-5-chloro-benzophenone and ethyl glycinate |              |              |
|                 | (C) 2-ethyl benzaldehyde and formaldehyde             |              |              |
|                 | (D) 2-methyl valeraldehyde and formaldehyde           |              |              |
| (a) 1-A, 2-C    | (b) 1-B, 2-C  | (c) 1-A, 2-D | (d) 1-D, 2-B |

2.16. Some of the drugs listed below from (A) to (D) are having specific mechanism of action. Match them.

- |   |                 |              |              |
|---|-----------------|--------------|--------------|
| (1) Interferes with the renin-angiotensin system  | (A) Hydralazine |              |              |
| (2) Directly relaxes arteriolar smooth muscles and thus decreases peripheral resistance | (B) Methyl Dopa |              |              |
|   | (C) Enalapril   |              |              |
|   | (D) Clonidine   |              |              |
| (a) 1-C, 2-A  | (b) 1-B, 2-C    | (c) 1-A, 2-D | (d) 1-B, 2-D |

2.17. Given below from (A) to (D) are application forms for the specific purpose listed as per (D) and (C) Act. Match them.

- |  |                   |              |              |
|--|-------------------|--------------|--------------|
| (1) Manufacture of cosmetics                           | (A) Form No. 31   |              |              |
| (2) Retail sale of schedule C and C <sub>1</sub> drugs | (B) Form NO. 20 C |              |              |
|  | (C) Form No. 20   |              |              |
|  | (D) Form No. 21   |              |              |
| (a) 1-A, 2-C   | (b) 1-B, 2-C      | (c) 1-A, 2-D | (d) 1-B, 2-D |



2.18. For many drugs in the I.P. exact solubility limits are not listed. Instead, descriptive terminology is employed.

Match the numbered solubility limits with the correct lettered solubility expression (gm/ml).

(1) Very soluble

(A) Less than 1

(2) Sparingly soluble

(B) From 1 to 10

(C) From 30 to 100

(D) From 100 to 1000

(a) 1-A, 2-C

(b) 1-B, 2-C

(c) 1-A, 2-D

(d) 1-B, 2-D

2.19. It is often desirable to formulate a dosage form so that its pH is approximately equivalent to that of the area of which it is administered. Match them.

(1) Blood

(A) pH 7.4

(2) Skin

(B) pH 6.4

(C) pH 5.5

(D) pH 6.8

(a) 1-A, 2-C

(b) 1-B, 2-C

(c) 1-A, 2-D

(d) 1-B, 2-D

2.20. The following microscopical characteristic is associated with the drugs mentioned in (A) to (D). Match them.

(1) Rubiaceous type of stomata (Paracytic)

(A) Atropa belladonna leaves

(2) Ranunculaceous type of stomata

(B) Cassia acutifolia leaves

(C) Cassia auriculata leaves

(D) Digitalis purpurea leaves

(a) 1-D, 2-B

(b) 1-B, 2-C

(c) 1-A, 2-D

(d) 1-B, 2-D

3. Give the five steps involved in the absorption of Transdermal dosage forms.

4. (A) Give the structural formula of the important phenolic constituent of clove oil.

(B) Give its name.

(C) What happens when a transverse section of the clove bud is treated with strong potassium hydroxide solution and examined under microscope?

(D) What are [answer in one sentence each]

(i) Mother clove

(ii) Blown clove

5. (A) Three types of electrons are involved in the absorption of energy in the UV region. What are they?

(B) In fluorimetry how the emitted radiation is separated from incident radiation.

(C) Why IR radiations cannot bring about electronic changes?

6. Show how you would convert to the following? Choose any other reagents if need be. Answer by giving equations only.

(A) Pyridine to Diodone I.P.

(B) 2-Amino Benzophenone and Ethyl Glycinate to Nitrazepam

(C) Methyl Acetoacetate and 2-Nitro-Benzaldehyde to Nifedipine.

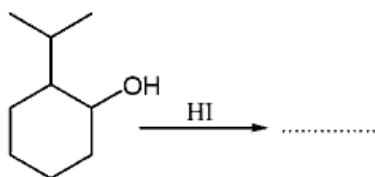
7. (A) Draw the structure of Allopurinol  
 (B) How does it act? (answer in one sentence)  
 (C) What is its interaction with Probenecid? (Answer in 2 sentences)  
 (D) What is its major clinical use? (Answer in 2 sentences)

**PART - B**

**Answer any TEN questions.**

8. Compound A with molecular formula  $C_{18}H_{22}O_2$  gave  
 (A) Chrysene on zinc dust distillation  
 (B) Oxime on treatment with  $NH_2 - NH_2$ .  
 (C) Methyl ether with  $CH_3I$ .  
 (D) On catalytic hydrogenation it is converted to  $C_{18}H_{30}O_2$ , a dihydroxy derivative.  
 (E) It undergoes a coupling reaction with benzene diazonium chloride.  
 What inferences you can draw from reaction - (A) to (E). Answer each in one sentence only.

9. (A) Mention the difference between the optical activity of Limonene and Dipentene.  
 (B) Show how Limonene is converted to Carvone.



- (C) Complete the following reaction:
10. (A) List four basic principles of HPLC.  
 (B) Name the technique used to handle solids as a thin paste in IR-spectrophotometry.
11. (A) What is the source of Belladonna Herb. I.P.?  
 (B) Give the microscopical characteristics of Belladonna leaf under the following headings. Answer each in one or two sentence only.  
 (i) Eipdermal cells  
 (ii) Stomata  
 (iii) Cakium oxalate crystals  
 (iv) Trichomes
12. Calculate the concentration of Dextrose required to make a 0.24% solution of sodium chloride iso osmotic with blood plasma. Molecular weights of NaCl = 58.5 and Dextrose -180.
13. Mention five advantages of Membrane filter method over other methods of sterilization.

14. Name the specific type of antagonism for the following combination:
- Dimercaprol and Mercury
  - Acetyl Choline and Epinephrine
  - Morphine and Naloxone
  - Nor Adrenaline and Phenoxy Benzamine
  - Adrenaline and Diazoxide
15. Write equation only for the chemical reactions involved in the following assays:
- Diphenhydramine Hydrochloride. I.P.
  - Benzocaine. I.P.
  - Ascorbic Acid I.P.
  - Di-iodo Hydroxy Quinoline. I.P.
16. (A) What is half wave potential?  
 (B) Give its application  
 (C) Oxygen dissolved in the solution for polarographic analysis produces two waves in a polarogram. Write the chemical reactions involved in the production of these waves in acid solution.
17. (A) What is Streptokinase. I.P.?  
 (B) Mention its important action.  
 (C) What are Zymogens?
18. (A) Tetracycline hydrochloride shows three acidity constants in aqueous solutions. Which particular functional groups are responsible for this? <http://www.xamstudy.com>  
 (B) "Salt of Phenoxy Methyl Penicillin with N.N'- bis-(dihydroabietyl)-ethylene diamine-provides very long acting liquid oral dosage form" - Give reason in one sentence only.  
 (C) Which group is Penicillin is responsible in determining the extent to which it is plasma protein bound?
19. Mention the nature and name of primary metabolites and the resulting change in the activity profile of the following drugs:
- Procaine
  - Imipramine
  - Enalapril
  - Chlorpromazine
  - 6-Mercaptopurine
20. (A) Metabolism of Lidocaine in the liver produces products A, B and C in a stepwise manner. Draw the structure of Lidocaine and the metabolic products A, B and C.  
 (B) The anti-inflammatory effect of NSAID's are explained on the basis of one important observation. Mention in one sentence.
21. (A) Give the structural formula of a Diuretic which contains a Pyrazine ring.  
 (B) It has a pK of 8.7. Which group is responsible for this?  
 (C) Why the above compound is very poorly and erratically absorbed from the G.I. tract?  
 (D) What happens when Benzhydryl bromide is treated with 4-hydroxy-1-methyl piperidine? [give equation only]  
 (E) Indicate the pharmacological category of the compound obtained in (D).



## ANSWER KEY GATE 1998

### Section - I

1.1	c	1.2	c	1.3	a	1.4	b
1.5	a	1.6	a	1.7	b	1.8	a
1.9	a	1.10	d	1.11	d	1.12	a
1.13	c	1.14	c	1.15	c	1.16	b
1.17	d	1.18	b	1.19	a	1.20	a
1.21	d	1.22	c	1.23	b	1.24	c
1.25	c	1.26	d	1.27	a	1.28	a
1.29	d	1.30	b	1.31	a	1.32	c
1.33	d	1.34	c	1.35	d		

### Section - II

2.1	c	2.2	a	2.3	b	2.4	b
2.5	c	2.6	c	2.7	c	2.8	a
2.9	d	2.10	a	2.11	d	2.12	a
2.13	b	2.14	a	2.15	d	2.16	a
2.17	c	2.18	a	2.19	a	2.20	a



# GPAT QUESTION PAPER 1997 WITH ANSWER KEY

## PHARMACEUTICAL SCIENCES

Time : 3 hours

Maximum Marks : 200

Read the following instructions carefully

1. Write all the answer in the answer book.
2. This question paper consist of TWO SECTION : A and B.
3. **Section A** has **Seven** questions. Answer ALL questions in this section.
4. **Section B** has Twenty questions. Answer any **TEN questions**. Strike off the answers which are not to be evaluated; else only the first ten answer will be considered.
5. Answer to **Section B** should start on a fresh page and should not be mixed with answers to **Section A**.
6. Answer to questions and answers to parts of a question should appear together and should not be separated.
7. In all questions of 5 marks, write clearly the important steps in your answer. These steps carry partial credit.
8. There will be no negative marking.
9. Read specific instruction given if any, in the individual section.

### SECTION - I

#### CHOOSE THE CORRECT ANSWER

1. For each question given below, four alternatives are provided, out of which only one is correct. Write the correct answer on the answer script by writing (a), (b), (c) or (d) against the respective sub-questions number.
  - 1.1 The first hydrolytic product of STREPTOMYCIN with methanolic hydrochloric acid is given below. Identify the correct one.
    - (a) Streptidine + Streptose + N-methyl glucosamine
    - (b) Streptidine + methyl strepto-biosaminide dimethyl acetal
    - (c) Streptamine + Streptose + N-methyl glucosamine
    - (d) Streptamine + Stentose dimethyl acetal + N-methyl glucosamine
  - 1.2 One of the following drugs interferes with cellular metabolism, especially the synthesis of Mycolic acid. Identify.

(a) Chloramphenicol	(b) Pyrazinamide
(c) Isonicotinic acid hydrazide	(d) Nicotinamide

1.3 A synthetic sweetening agent which is approximately 200 times sweeter than sucrose and has no after taste is:

- (a) Saccharin (b) Aspartame  
(c) Cyclamate (d) Sorbitol

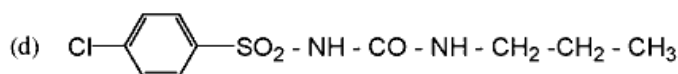
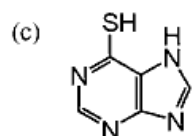
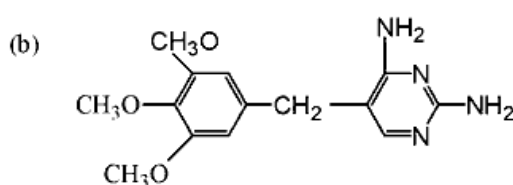
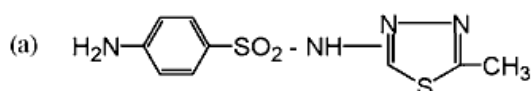
1.4 In capsules ROTOSORT is used for

- (a) Filling Powder into capsules (b) Filling liquids into capsules  
(c) Filling pellets into capsules (d) Sorting the filled capsules

1.5 Shellac is used for the purpose of coating of tablets as

- (a) Polishing agent (b) Film coating agent  
(c) Enteric coating agent (d) Sub-Coating agent for sugar coating

1.6 Listed below are structures of some drugs. One of them prevents the incorporation of PABA into Folic acid. Identify



1.7 In Quantitative T.L.C. radioactive material can be studied by

- (a) Visual comparison (b) Densitometer  
(c) Gravimetry (d) Geiger counter

1.8 One of the following ingredients which improves the flow property of granules is:

- (a) Glidant (b) Emollient (c) Lubricant (d) Surfactant

1.9 The wavelength source in N.M.R. spectrometer is

- (a) Goniometer (b) Radiofrequency oscillator  
(c) High voltage generator (d) Klystron oscillator

1.10 One of the following materials is used for the preparation of master grating. Identify

- (a) Glass (b) Iron (c) Aluminium (d) Teflon

1.11 Benzathine penicillin is

- (a) An equimolecular composition of Amoxicillin + N.N dibenzyl ethylene diamine  
(b) A molecular complexation of Benzyl penicillin+ N.N dibenzyl ethylene diamine  
(c) A molecular complexation of Cloxacillin + ethylene diamine  
(d) Equimolecular proportion of Amoxicillin + ethylene diamine

1.12 Schick test is performed to ascertain susceptibility to

- (a) Tetanus (b) Diphtheria (c) Mumps (d) Syphilis

1.13 Which of the following commonly available large volume dextrose solution for intravenous use is isotonic?

- (a) 2.5% W/V
- (b) 5.0% W/V
- (c) 10% W/V
- (d) 20% W/V

1.14 The term bioavailability refers to the

- (a) Relationship between the physical and chemical properties of a drug and the systemic absorption of the drug
- (b) Measurement of the rate and amount of therapeutically active drug that reaches the systemic circulation
- (c) Movement of drug into the body tissues over time
- (d) Dissolution of a drug in the gastrointestinal tract

1.15 Among the propellants used in aerosols one of the following is used for topical pharmaceutical aerosols.

- (a) Trichloro monofluoro methane
- (b) Dichloro difluoro methane
- (c) Dichloro tetra fluoro ethane
- (d) Propane

1.16 The principal structural component of the cell wall in bacteria is made up of

- (a) Simple protein
- (b) Peptidoglycan polymer
- (c) Complex polysaccharides
- (d) Glycoprotein

1.17 Which of the following has the highest degree of ionization in an aqueous solution?

- (a) Aspirin pKa = 3.5
- (b) Indomethacin pKa = 4.5
- (c) Warfarin pKa = 5.1
- (d) Ibuprofen pKa = 5.2

1.18 Tetracyclines are avoided during pregnancy because

- (a) It is teratogenic
- (b) It may affect the bone growth of foetus
- (c) It causes discolouration of mothers teeth
- (d) It May cause abortion

1.19. The Xenobiotics that does not cause nephrotoxicity is

- (a) Streptozocin
- (b) Cisplatin
- (c) Gentamycin
- (d) Isoniazid

1.20. Which of the following function of OPIOID receptors?

- (a) Decrease Nor adrenaline release
- (b) Decrease Dopamine release
- (c) Decrease Serotonin release
- (d) Decrease Acetyl choline release

1.21. Assume that a typical type of Cancer is susceptible to an individual drug. Listed below are some therapeutic combination of anti-cancer drugs which are rationale except one. Identify.

- (a) Thiotepa and Prednisone
- (b) Cyclophosphamide and 6-Mercaptopurine
- (c) Doxorubicin and Methotrexate
- (d) Chlorambucil and Melphalan

1.22. One of the following emissions from the decay of Radio nuclides is commonly used in sterilization. Identify

- (a) Gamma
- (b) X-ray
- (c) Alpha
- (d) Positron

1.23. Clinically available anticancer agents have one of the underlying mechanism of action, they act by

- (a) Improving body defense mechanism
- (b) Inhibition of cell wall synthesis
- (c) Receptor site blockade of cancer cell content
- (d) Cell Growth inhibitor

1.24. Listed below are some of the common Radio nuclides used in Nuclear Pharmacy which one is generator produced?

- (a)  $^{201}\text{Tl}$                       (b)  $^{67}\text{Ga}$                       (c)  $^{133}\text{Xe}$                       (d)  $^{99\text{m}}\text{Tc}$

1.25. Smallpox Vaccine contains

- (a) Living Virus Vaccinia                      (b) Living culture of B.C.G.  
(c) Attenuated staphylococcus                      (d) Living Virus of Hepatitis

1.26. The solution strength of  $\text{Ca}^{++}$  in terms of mg/L for a Calcium injection which contains 5m Eq. Calcium ( $\text{Ca}^{++}$ ) per 100 ml is given below. Identify the correct one. [At 40 wt -  $\text{Ca}^{++} = 40$ ].

- (a) 150                      (b) 500                      (c) 750                      (d) 1000

1.27. Listed below are some of the drug intermediates. Choose the correct one for the synthesis of Procainamide.

- (a) p-nitro benzyl chloride and Diethyl amino ethylamine  
(b) p-nitro benzyl chloride and ethyl amino ethylamine  
(c) p-nitro cinnamoyl chloride and Diethyl amino ethylamine  
(d) p-nitro benzene and Diethyl amino ethylamine

1.28. Choose the correct name for Digitoxigenin. <http://www.xamstudy.com>

- (a)  $3\beta$ ,  $14\beta$ ,  $16\beta$  trihydroxy cardenolide  
(b)  $3\beta$ ,  $12\beta$ ,  $14\beta$  trihydroxy cardenolide  
(c)  $3\beta$ ,  $14\beta$  dihydroxy cardenolide  
(d)  $1, 3, 5, 11\alpha, 14, 19\beta$  -hexahydroxy cardenolide

1.29. 2, 6-dimethyl aniline and chloro acetyl chloride are the starting compounds for the synthesis of one of the following drugs. Choose the correct one.

- (a) Lidocaine                      (b) Prilocaine                      (c) Bupivacaine                      (d) Cinchocaine

1.30. Choose the correct Geneva name for TRANYL CYPROMINE.

- (a) (-) trans-2-Phenyl Cyclopropylamine                      (b) (+) trans-2-Phenyl Cyclopropylamine  
(c)  $\pm$  cis-2-Phenyl Cyclopropylamine                      (d)  $\pm$  trans-2-Phenyl Cyclopropylamine

1.31. In take of which of the following should be avoided by a patient taking oral anticoagulant?

- (a) Cyanocobalamin                      (b) Thiamine                      (c) Menadione                      (d) Tocopherol

1.32. Ellipsoidal schizolysigenous oil glands are important diagnostic of

- (a) Ergot                      (b) Ginseng                      (c) Cinnamon                      (d) Clove

1.33. Catecholamines act by

- (a) Decrease the amount of glucose released into the blood  
(b) Increase the utilization of glucose by muscle  
(c) Increase the amount of glucose released into the blood  
(d) Decrease the amount of glucose in the muscle.

1.34. Hyoscyamine an alkaloid obtained from Atropa belladonna

- (a) Readily racemises to atropine with ethanolic alkali. Atropine is ( $\pm$ ) Hyoscyamine  
(b) Readily disintegrates into atropine with acid solution. Atropine is (-) Hyoscyamine  
(c) Readily rearranges into atropine with acid solution. Atropine is (+) Hyoscyamine  
(d) Readily racemise to atropine with ethanolic alkali. Atropine.

1.35. Identify the correct molecule which controls the biosynthesis of proteins in living organisms

- (a) DNA                                      (b) RNA                                      (c) Purines                                      (d) Pyrimidines

**SECTION - II**

**MATCH THE FOLLOWING**

**2. In the following sub questions match each of the items 1, 2, 3 and 4 on the left with an appropriate item on the right and indicate the answer.**

2.1 Listed below are substances which are assayed by methods mentioned in (A) to (F). Match them.

- |                                   |                                       |
|-----------------------------------|---------------------------------------|
| (1) Ascorbic Acid Tablets I.P.    | (A) Fluorimetry                       |
| (2) Thiamine Hydrochloride I.P.   | (B) Spectrophotometry                 |
| (3) Calcium Pantothenate I.P.     | (C) Ceric ammonium sulphate oxidation |
| (4) Pyridoxine Hydrochloride I.P. | (D) Complexometry                     |
| (E) Non-aqueous                   | (F) Gravimetry                        |
| (a) 1-C, 2-D, 3-A, 4-E            | (b) 1-A, 2-C, 3-D, 4-E                |
| (c) 1-C, 2-E, 3-E, 4-B            | (d) 1-A, 2-B, 3-C, 4-F                |

2.2 The diagnostic features of crude drugs are given in 1-4. Their descriptions are given in (A) to (F). Match them.

- |                        |  |
|------------------------|--|
| (1) Trichome           | (A) Two similar cells placed with their long axis parallel and having smaller intercellular space. |
| (2) Cicatrix           | (B) Epidermal cells which do not have any definite function  |
| (3) Stomata            | (C) An elongated tubular outgrowth of an epidermal cell  |
| (4) Mesophyll          | (D) Trichomes having fallen or been rubbed off leaving a scar                                      |
|                        | (E) The whole of the parenchymatous ground tissue between two epidermises                          |
|                        | (F) Flat and has one or more rows of Palisade cells.   |
| (a) 1-C, 2-D, 3-A, 4-E | (b) 1-A, 2-C, 3-D, 4-E   |
| (c) 1-A, 2-C, 3-E, 4-D | (d) 1-A, 2-B, 3-C, 4-F   |

2.3 Some types of drugs are listed below, the specific examples are given in (A) to (F). Match them.

- |                          |                        |
|--------------------------|------------------------|
| (1) Anti folate          | (A) Vinblastine        |
| (2) Purine analogues     | (B) Thioguanine        |
| (3) Pyrimidine analogues | (C) 5-Fluorouracil     |
| (4) Antimitotic          | (D) Methotrexate       |
|                          | (E) Actinomycin        |
|                          | (F) Cytarabine         |
| (a) 1-D, 2-B, 3-C, 4-A   | (b) 1-A, 2-C, 3-D, 4-E |
| (c) 1-A, 2-C, 3-E, 4-D   | (d) 1-A, 2-B, 3-C, 4-F |



2.4 Heterocyclic system (1-4) and the natural products in which they are present is given in (A) to (F). Match them.

- |                        |                        |
|------------------------|------------------------|
| (1) Imidazole          | (A) Reserpine          |
| (2) B Carboline        | (B) Pilocarpine        |
| (3) Hetrosteroidal     | (C) Conessine          |
| (4) Isoquinoline       | (D) Ergotamine         |
|                        | (E) Papaverine         |
|                        | (F) Scopolamine        |
| (a) 1-C, 2-D, 3-A, 4-E | (b) 1-B, 2-A, 3-C, 4-E |
| (c) 1-A, 2-C, 3-E, 4-D | (d) 1-A, 2-B, 3-C, 4-F |

2.5. Starting materials used for the synthesis of the following drugs are given (A) to (F). Match them.

- |                              |   |
|------------------------------|---|
| (1) Mepyramine Maleate       | (A) Azocine and Chloromethyl cyanide                  |
| (2) Guanethidine Sulphate    | (B) 10-11 Dihydro-5-H. dibenz.[b-f] azepine           |
| (3) Isoxsuprine              | (C) 5-Oxo 10-11 dihydro 5-H dibenz [a-d] cycloheptene |
| (4) Imipramine Hydrochloride | (D) 4-hydroxy nor-ephedrine                           |
|                              | (E) Benzaldehyde and 2-chlopro pyridine               |
|                              | (F) 4-methyl benzaldehyde and 2-amino pyridine        |
| (a) 1-C, 2-D, 3-A, 4-E       | (b) 1-A, 2-C, 3-D, 4-E                                |
| (c) 1-F, 2-A, 3-D, 4-B       | (d) 1-A, 2-B, 3-C, 4-F                                |

2.6. Listed below are some tests carried out to identify the constituents given in (A) to (F). Match them correctly.

- |                        |                        |
|------------------------|------------------------|
| (1) Benedict's test    | (A) Bile salt          |
| (2) Hay's test         | (B) Calcium            |
| (3) Gimelin's test     | (C) Bile pigments      |
| (4) Salkowski test     | (D) Urea               |
|                        | (E) Ketone bodies      |
|                        | (F) Glucose            |
| (a) 1-F, 2-A, 3-C, 4-B | (b) 1-A, 2-C, 3-D, 4-E |
| (c) 1-A, 2-C, 3-E, 4-D | (d) 1-A, 2-B, 3-C, 4-F |

2.7. Antibiotics and their biochemical origins are given below. Match them.

- |                        |                           |
|------------------------|---------------------------|
| (1) Cycloserine        | (A) Two amino acid units  |
| (2) Cephalosporin      | (B) Single amino acid     |
| (3) Neomycin           | (C) Sugars                |
| (4) Erythromycin       | (D) Polypeptides          |
|                        | (E) Acetate or Propionate |
|                        | (F) Polycyclic units      |
| (a) 1-C, 2-D, 3-A, 4-E | (b) 1-B, 2-F, 3-C, 4-E    |
| (c) 1-A, 2-C, 3-E, 4-D | (d) 1-A, 2-B, 3-C, 4-F    |

2.8. Match the following relationship correctly.

- |                         |   |
|-------------------------|---|
| (1) Hypokalemia         | (A) Biotransformation prior to eliciting pharmacological response |
| (2) Spironolactone      | (B) Competitive antagonist of Aldosterone                         |
| (3) Rhodopsin in Retina | (C) Reduction of Serum K <sup>+</sup> level                       |
| (4) Prodrug             | (D) Vitamin A   |
|                         | (E) Biotin  |
|                         | (F) Competitive antagonist of cortisone                           |
| (a) 1-C, 2-D, 3-A, 4-E  | (b) 1-A, 2-C, 3-D, 4-E  |
| (c) 1-A, 2-C, 3-E, 4-D  | (d) 1-C, 2-B, 3-A, 4-A  |

2.9. In parenteral products, listed below are some ingredients. Their main functions are given in (A) to (F). Match them.

- |                        |                              |
|------------------------|------------------------------|
| (1) Thiomersal         | (A) Chelating agent          |
| (2) Ascorbic Acid      | (B) Buffer                   |
| (3) EDTA-salt          | (C) Anti-oxidant             |
| (4) Sodium Chloride    | (D) Anti microbial agent     |
|                        | (E) Vehicle                  |
|                        | (F) Tonicity adjusting agent |
| (a) 1-C, 2-D, 3-A, 4-E | (b) 1-A, 2-C, 3-D, 4-E       |
| (c) 1-D, 2-C, 3-A, 4-F | (d) 1-A, 2-B, 3-C, 4-F       |

2.10. Size, shape and Mode of arrangements is typical of certain Micro-organisms. Match them correctly.

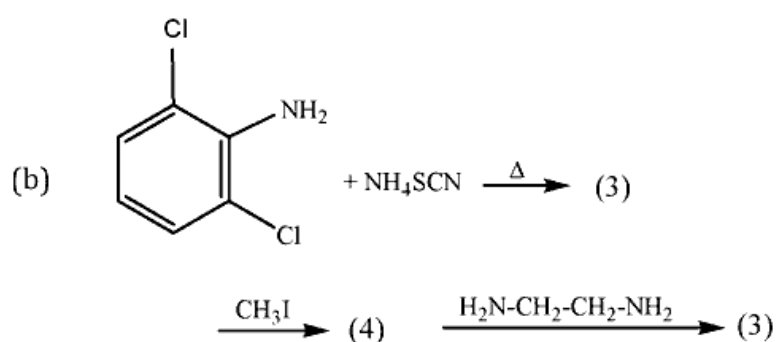
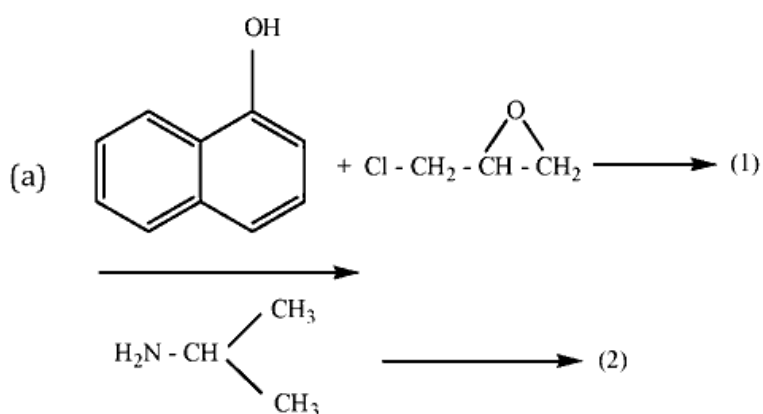
- |                          |  |
|--------------------------|--|
| (1) Streptococci         | (A) Comma and S shaped form                      |
| (2) Sarcina              | (B) Gram positive arranged in chains             |
| (3) Bacillus Anthracis   | (C) Multiples of eight                           |
| (4) Vibrios and Spirilla | (D) Large bacilli, rectangular and gram positive |
|                          | (E) Gram negative cocci                          |
|                          | (F) Rod shaped-Acid fast                         |
| (a) 1-B, 2-C, 3-F, 4-A   | (b) 1-A, 2-C, 3-D, 4-E                           |
| (c) 1-A, 2-C, 3-E, 4-D   | (d) 1-A, 2-B, 3-C, 4-F                           |

3. Give the names of the equipments used for the following:

- (A) To determine the Flash point in aerosols.
- (B) To determine the particle size distribution in aerosols.
- (C) To determine the Hardness of the tablets
- (D) To determine the particle size in a suspension
- (E) To measure the volume of particles in powders

4. (i) Mention 2 gaseous materials used for sterilization.  
(ii) Name a filter used for sterilization  
(iii) Name the method used for sterilization of plastic syringes.  
(iv) Name an equipment which can give limited aseptic area.

5. (A) Give four important side effects of MAO inhibitors.  
 (B) Name a drug which is a presynaptic receptor stimulant
6. (A) Define the following terms:  
 (i) Molar absorptivity  
 (ii) Frequency  
 (iii) Equivalent conductance  
 (B) Give only the equations for the reactions involved in the assay (IP-1985) of I.N.H.
7. Complete the following reactions by inserting the appropriate products:



### PART - B

**Answer any TEN questions.**

**(50 Marks)**

8. Define mottling. Give three reasons for mottling.
9. (a) Name the causative organisms of the following infections:  
 (i) Intestinal and extraintestinal amoebiasis  
 (ii) Schistosomiasis  
 (iii) Filariasis
- (b) Name a Macrolide antibiotic containing a lactone ring and one or more deoxy sugars which inhibits protein synthesis.
- (c) A derivative of TETRACYCLINE which has greater acid and alkaline stability and slower rate of excretion. It produces higher and more prolonged blood levels. Name it

10. Give one typical identification test each for
- |                             |                               |
|-----------------------------|-------------------------------|
| (a) Eugenol in clove oil    | (b) Cardenolides of Digitalis |
| (c) Alkaloids of Belladonna | (d) Alkaloids of Ergot        |
| (e) Glycosides of Senna     |                               |
11. Laboratory report of the blood analysis of a patient showed RBC count = 440000/cu mm. Hb content 11.2 gm/100 ml. Calculate the % age of Haemoglobin, % of Red cell and colour index. Comment on the condition of the patient. Normal value. RBC count = 500000/cu mm Hb content = 14.8 gm/100 ml.
12. Complete the following equations showing the structure of reactants and products:
- Pyrazine-2-Carboxylic acid is treated with  $\text{CH}_3\text{OH}$  and the resulting compound is treated with ammonia.
  - 5-Chloro salicylic acid is treated with 2-chloro-4-nitro aniline in presence of  $\text{PCl}_3$ .
  - 2-methyl-5-nitro imidazole is treated with 2-chloro ethanol, resulting compound is benzoylated.
13. Categorize the following drugs pharmacologically and draw the heterocyclic system present in them:
- |                  |                   |
|------------------|-------------------|
| (i) Imipramine   | (ii) Diazepam     |
| (iii) Cimetidine | (iv) Dipyridamole |
| (v) Thiotepa     |                   |
14. (a) Name four specific tests in the investigation of a suspected case of AIDS.  
 (b) Name the organism which is used in the microbiological assay of GENTAMICIN.
15. (a) Calculate the half life for a drug formulation which is most stable at pH 2.5 at which pH, the rate constant is  $5 \times 10^{-7} \text{ s}^{-1}$  at  $25^\circ\text{C}$ . The drug obeys first order kinetics.  
 (b) Give the Henderson-Hasselbalch equation for a weak base.  
 (c) Define the term area under the curve.
16. (a) The UV spectrum of Benzaldehyde contains different absorption bands. What are the electronic transition taking place to form these bands? Name them. <http://www.xamstudy.com>  
 (b) Define auxochrome. Give two examples.
17. Outline the synthesis of CAFFEINE from Dimethyl urea and ethyl cyanoacetate. Give complete steps showing the reactants and products.
18. Give a specimen label of GENTAMICIN INJECTION [I.P.1985] as per D and C act.
19. Show how you would convert the following. Choose any other reagents if need be. Give equations.
- 2,4-dichloro benzoic acid to FUROSEMIDE
  - 4-chloro benzyl cyanide and 2-chloropyridine to an antihistaminic
  - Benzhydryl bromide to DIPHENDYDRAMINE
20. Write the reaction sequence catalyzed by the enzymes for the transfer of acyl Co-A across inner mitochondrial membrane and degradation of fatty acids.

21. (a) Give an equation and show how it can be used to measure the solubility of a sparingly soluble salt by conductometry.  
 (b) Give three important requirements to prepare a normal Hydrogen electrode.
22. Name the metabolic reaction and give the structure of the major metabolite formed from the following medicinal agents:  
 (a) Chlorpromazine (b) 6-mercatopurine  
 (c) Meperidine (d) Sulphamethoxazole  
 (e) Nicotinamide
23. Write the characteristic I.R. absorption bands from the following functional groups:  
 (a)  $>C=O$  group in aldehydes (b) Free-OH group  
 (c) Primary amino group (d) C-Cl-stretching  
 (e)  $C-NO_2$  Aromatic
24. Write in one or two sentences the mechanism of action of the following:  
 (a) Isosorbide mononitrate (b) Sulphamethoxazole and Trimethoprim  
 (c) Cisplatin (d) Chloramphenicol
25. Following Phytoconstituents are present in specific part of a crude drug. Give the botanical name and the part in which they are present.  
 (a) Morphine (b) Eugenol  
 (c) Deserpidine (d) Dihydroxy Anthracene derivatives  
 (e) Ergotoxine
26. Give the drug interactions for the following combination-answer in 2 sentences each.  
 (a) Acetazolamide and Quinidine (b) Methyl Dopa and Chlorothiazide  
 (c) Amphotericin-B and Digitalis glycosides (d) Ascorbic Acid and PAS  
 (e) Haloperidol and Rifampicin
27. Name and draw the structural formulae of a  
 (a) Vitamin which participates in the metabolic reaction as coenzyme-A  
 (b) Water soluble vitamin which is derived from sugar  
 (c) Vitamin which contains Pteridine ring system and is used as an antianemic factor  
 (d) Vitamin which as coenzyme takes part in the decarboxylation of  $\alpha$ -keto acid  
 (e) Vitamin which forms part of  $NAD^+$  and NADH.

***End of paper***



## ANSWER KEY GPAT 1997

### Section -I

1.1	a	1.11	b	1.21	a	1.31	d
1.2	c	1.12	b	1.22	a	1.32	d
1.3	b	1.13	b	1.23	d	1.33	c
1.4	d	1.14	b	1.24	d	1.34	a
1.5	d	1.15	d	1.25	a	1.35	b
1.6	a	1.16	b	1.26	d		
1.7	d	1.17	a	1.27	a		
1.8	a	1.18	b	1.28	c		
1.9	b	1.19	d	1.29	a		
1.10	c	1.20	c	1.30	d		

### Section -II

2.1	c	2.2	a	2.3	a	2.4	b
2.5	c	2.6	a	2.7	b	2.8	d
2.9	c	2.10	a				

# GPAT QUESTION PAPER 1996 WITH ANSWER KEY

## PHARMACEUTICAL SCIENCE

### XL : Life science

Time : 3 hours

Maximum Marks : 150

Read the following instruction carefully.

1. Write all the answer in the answer book.
2. This question paper contains five sections listed below.

Section Code	Section
M	Chemistry
N	Biochemistry
P	Life Science
Q	Microbiology
R	Pharmacy

3. Answer three Sections only. Section M is compulsory. Choose two others from the Remaining Sections.
4. Answer all questions in a section. Each section carries 50 marks.
5. Write SECTION CODES of the selected sections in the boxes provided on the cover page of the answer book.
6. ANSWER TO DIFFERENT SECTIONS SHOULD NOT BE MIXED WITH EACH OTHER.
7. Answer to question and answer to different parts of a question should appear together.
8. In all questions of 5 or more marks write clearly the important step in your answer. These steps carry partial credit.
9. Read the specific instructions given, if any, in the individual sections.
10. There will be no negative marking.

#### NOTE:

**In the year 1996, for the first time Pharmacy was including under the board heading of life science consisting of Chemistry, Biochemistry, Life science, Microbiology and Pharmacy section. According to the new rules, a student had to opt for two subjects (with Chemistry as a compulsory Subject) apart from his specialization subject. Since, this rule was abolished from the subsequence years therefore we are including the question paper of Pharmacy section only for the year 1996 as the other sections has no relevance for future preparations.**

#### SECTION - R1

#### PHARMACY

- R1.** For each question given below four answers are provided, out of which only one is correct. Write the correct answer on the answer book by writing A, B, C or D against the corresponding subquestion number in the answer book.

1.1. Clonidine hydrochloride – IP is

- (a) Monoamine oxidase inhibitor which contains in imidazoline ring system.
- (b) Arterial venous vasodilator which contains in imidazoline ring system.
- (c) Monoamine oxidase inhibitor which contains in Pyrimidine ring system.
- (d) Monoamine oxidase inhibitor which contains in Phthalazine ring system.

1.2. Borntrager's test is performed for identification of

- (a) Digitoxin
- (b) Reserpine
- (c) Digoxin
- (d) Dianthrone of rhein

1.3. The electrode system employed in potentiometric titrations of acids by Non-aqueous method in basic solvents is

- (a) Glass – Calomel electrodes
- (b) Antimony – Glass electrodes
- (c) Glass – Antimony electrodes
- (d) Antimony Calomel electrodes

1.4. The drug NALOXONE

- (a) Produces morphine like activity
- (b) Produces respiratory depression
- (c) Induces constipation
- (d) Precipitates withdrawal symptoms in morphine

1.5. Phenyl alanine, Ornithine and methionine are involved in the biogenesis of :

- (a) Lysergic acid
- (b) Reserpine
- (c) L-Hyosyamine
- (d) Papaverine

1.6. The area under the serum concentration time-curve represents the

- (a) Biologic half life of the drug
- (b) Amount of drug is cleared by the kidneys
- (c) Amount of drug absorbed
- (d) Amount of drug excreted in the urine

1.7. An interference filter consist of

- (a) An iron plate coated with selenium
- (b) A layer of silver deposited on glass coated with  $MgF_2$
- (c) A Tungsten plated coated with silver oxide
- (d) A solid sheet of glass coloured by pigment <http://www.xamstudy.com>

1.8. Which of the following is the first process that must occur before a drug can become available for absorption from a tablet dosage form?

- (a) Dissolution of the drug in the G I, fluids
- (b) Dissolution of the drug in the epithelium
- (c) Ionisation of the drug
- (d) Disintegration of the tablet

1.9. Propranolol

- (a) Reduces myocardial oxygen consumption
- (b)  $\beta - 1$  receptor selective blocker
- (c) Has intrinsic sympathomimetics activity
- (d) Is a hypotensive agent in patients with normal blood pressure

1.10. 2-bis (2 chlorethyl) amino pro hydro 1, 3, 2 oxazaphosphorinan is an

- (a) Anti-metabolite
- (b) Alkylating agent
- (c) Anti-tubercular agent
- (d) Anti-arrhythmic drug

1.11. A moiety of a molecule responsible for selective absorption of radiation in a specific range is called as

- (a) Auxochrome
- (b) Catalyst
- (c) Anti-tubercular agent
- (d) Anti-arrhythmic drug

1.12. Chlordiazepoxide is synthesized from

- (a) m-Chloroaniline and Benzyl chloride
- (b) p-Chloroaniline and Benzyl chloride
- (c) p-Chloroaniline and Benzedrine
- (d) p-Nitroaniline and Benzyl chloride

1.13. Tablets are placed into a coating chamber and hot air is introduced through the bottom of the chamber. Coating solution is applied through an atomizing nozzle from the upper end of the chamber. This technique is called:

- (a) Sealing before sugar coating
- (b) Coating by air suspension
- (c) Spray-pan coating
- (d) Chamber coating

## SECTION - R2

R2. In the following three questions match each the items 1, 2, 3 and 4 on the left, with an appropriate item on the right and indicate the answer as for example.

2.1. Match the following terms with Phytoconstituents mentioned below:

- (1) OPIUM
  - (2) ERGOMETRINE
  - (3) SCOPOLAMINE
  - (4) GINSENOSES
- (A) Tropane alkaloids
  - (B) Cardiac glycosides
  - (C) Latex of poppy capsules
  - (D) Oxytocic effect
  - (E) Adaptogenic and tonic
  - (F) Cyanogenetic aglycone
- (a) 1-C, 2-D, 3-A, 4-E
  - (b) 1-A, 2-C, 3-D, 4-E
  - (c) 1-A, 2-C, 3-E, 4-D
  - (d) 1-A, 2-B, 3-C, 4-F

2.2. Formation of hard gelatin may necessitate the additives listed 1 to 4, their functions are given in A to F.

Match them

- (1) Diluents
  - (2) Protectives
  - (3) Glidants
  - (4) Antidusting
- (A) For preventing absorption of moisture by hygroscopic substance
  - (B) For increasing the bulk
  - (C) To prevent cross contamination
  - (D) For regulating the flow
  - (E) For avoiding weight variation
  - (F) For Bacterial resistant
- (a) 1-C, 2-D, 3-A, 4-E
  - (b) 1-A, 2-C, 3-D, 4-E
  - (c) 1-A, 2-C, 3-E, 4-F
  - (d) 1-B, 2-A, 3-D, 4-C

2.3. For the drugs listed 1 to 4, mechanism of action is indicated from A to F. Match them.

- |                     |   |
|---------------------|---|
| (1) VINCRISTINE     | (A) Macrocyclic antibiotic which inhibits DNA dependent RNA polymerase                                  |
| (2) STREPTOMYCIN    | (B) An antibiotic containing nitro group which binds to 50 S ribosomal subunit                          |
| (3) CHLORAMPHENICOL | (C) A dimeric indole alkaloid which binds to tubulin, a class of protein that forms the mitotic spindle |
| (4) RIFAMPICIN      | (D) An aminoglycoside antibiotic, capable of binding To 30 ribosomal subunit                            |
|                     | (E) A quinoline alkaloid which inhibits the growth of Plasmodium vivax                                  |
|                     | (F) A naphthancene antibiotic which inhibits cell wall synthesis  |
- (a) 1-C, 2-D, 3-B, 4-A                      (b) 1-A, 2-C, 3-D, 4-E  
(c) 1-A, 2-C, 3-E, 4-D                      (d) 1-A, 2-B, 3-C, 4-F

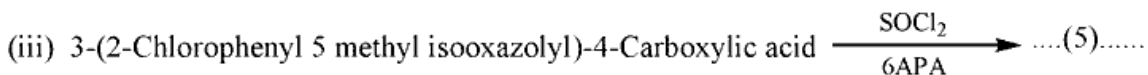
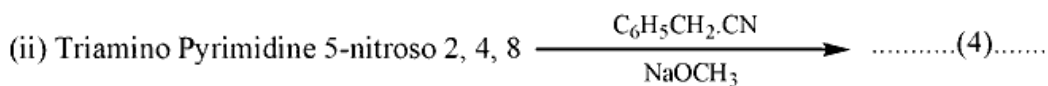
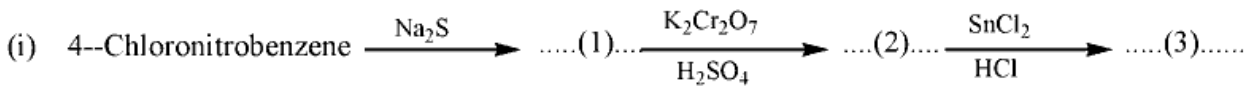
R3. Name the crude drug associated with the following diagnostically important histological character.

- (1) Stratified cork
- (2) Non-lignified warty trichomes
- (3) Pseudoparenchyma
- (4) Ellipsoidal schizolysigenous oil glands
- (5) Clothing and glandular hairs

R4.

- (i) Excited triplet state is more stable than the excited singlet state-why?
- (ii) There are three important reactions involved in the assay of folic acid I. P. Write the equations.

R5. Complete the following reactions by giving the structural formulae of the products 1, 2, 3, 4 and 5.



R6. (i) The Coacervation technique of microencapsulation consists of three steps. Mention them in one sentence each. <http://www.xamstudy.com>

(ii) Give the full form of HEPA-filter.

(iii) Define Ocusert System



- R7.** (i) Compare the principal pharmacological effects of I<sub>A</sub>, I<sub>B</sub> and I<sub>C</sub> anti-arrhythmic drugs. Answer in one or two sentences only.
- (ii) Define:
- (a) First pass effect
- (b) Open one compartment model

**End of paper**

**ANSWER KEY GPAT 1996**

**Section - R1**

1.1	b	1.2	d	1.3	a	1.4	a
1.5	c	1.6	c	1.7	b	1.8	d
1.9	a	1.10	b	1.11	c	1.12	b
1.13	b						

**Section - R2**

2.1	a	2.2	d	2.3	c
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# GPAT QUESTION PAPER 1995 WITH ANSWER KEY

## PHARMACEUTICAL SCIENCE

Time : 3 hours

Maximum Marks : 200

Read the following instruction carefully.

1. Write all the answer in the answer-book.
2. This question paper consists of two sections : A and B.
3. Section A has NINE question. Answer all questions in this section.
4. Section B has TWENTY question. Answer any TEN questions from this section. Strike off the answer which are not to be evaluated; else only the first ten answers will be considered. Answers to this section should start on a fresh page and should not be mixed with answers to Section A.
5. Answers to questions and answers to the parts of a questions should appear together in the same sequence in which they appear in the question paper.
6. In all question of 5 marks. write clearly the important steps in your answer, These steps carry partial credit.
7. There will be no negative marking.

### SECTION - I

**R1.** For each question given below four answers are provided, out of which only one is correct. Write the correct answer on the answer book by writing A, B, C or D against the corresponding subquestion.

1.1. One of the drug is excreted primarily by renal tubular sections. Identify.

- |                  |                   |
|------------------|-------------------|
| (a) Gentamycin   | (b) Kanamycin     |
| (c) Tetracycline | (d) Carbenicillin |

1.2. Identify one of the cancer chemotherapeutic agent which is an antimetabolite?

- |                      |                      |
|----------------------|----------------------|
| (a) Flurouracil      | (b) Nitrogen mustard |
| (c) Cyclophosphanide | (d) Chlorambucil     |

1.3. Agents useful in the treatment of bronchial asthma usually

- (a) Block both alpha and beta adrenergic receptors
- (b) Stimulate alpha receptors but block beta receptors
- (c) Stimulate beta receptors but block alpha receptors
- (d) Stimulate alpha and/or beta receptors

1.4. The antiarrhythmic drug Quinidine is:

- |                                    |                                 |
|------------------------------------|---------------------------------|
| (a) (+) Stereoisomer of Quinine    | (b) (-) Stereoisomer of Quinine |
| (c) (+) Racemic mixture of Quinine | (d) None of the above           |

- 1.5. Beta-Carboline ring system is present in
- (a) Emetine alkaloid (b) Cortisone acetate  
(c) Deserpidine molecule (d) Atropine alkaloid
- 1.6. Licence for wholesale of drugs specified in schedule C and C<sub>1</sub> are issued in form
- (a) 20 A (b) 20 B (c) 21 B (d) 22 A
- 1.7. The principal constituents Anethole (50-60%) and Fenchone (18-20%) are present in the volatile oil obtained from
- (a) Fruits of *Ammi visnaga*-Linn (b) Fruits of *Foeniculum capillaceum* G (F. vulgare)  
(c) Fruits of *Carum carvi*-Linn (d) Fruits of *Anethoum graveolens*-Linn
- 1.8. Caffeine on oxidation with KClO<sub>3</sub> /HCl gives :-
- (a) Trimethylalloxan and urea (b) Methylalloxan and dimethyl urea  
(c) Dimethylalloxan and methyl urea (d) None of the above
- 1.9. One of the following types of adverse drug reactions is not believed to be dose related phenomena
- (a) Side effects and toxic reactions (b) Toxic reactions and hypersensitivity  
(c) Side effects and hypersensitivity (d) Hypersensitivity and idiosyncrasy
- 1.10. Green bones are used for the preparation of a gelatin of the type
- (a) A (b) B (c) C (d) A and B
- 1.11. In capsules, ROTOFIL is used for filling:
- (a) Powders (b) Pellets (c) Liquids (d) Corrosive liquids
- 1.12. Gelatin and glycerin are used for the preparation of lamellae in a specified ratio. Identify the correct ratio
- (a) 1 : 1 (b) 5 : 1 (c) 9 : 1 (d) 10 : 1
- 1.13. The Shick test is used to determine susceptibility to
- (a) Measles (b) Diphtheria (c) Polio (d) Typhoid
- 1.14. One of the following general characteristics is not true for alkaloids?
- (a) Nitrogen in the heterocyclic nucleus (b) Good solubility in organic solvents  
(c) pK<sub>a</sub> less than 7 (d) Exhibit optical activity
- 1.15. Silver/Silver chloride electrode consists of
- (a) Metallic silver coated with a layer of silver chloride  
(b) Polished platinum wire coated with silver chloride  
(c) Silver wire dipped in a saturated solution of silver chloride  
(d) Two electrodes one of silver and other of silver chloride
- 1.16. In gel permeation chromatography molecules are separated on the basis of their
- (a) Chemical nature (b) Size and shape  
(c) Adsorptive properties (d) Partition coefficient
- 1.17. According to Pauli exclusion principle, spins of two electrons in the same orbital are
- (a) Parallel to one another (b) Perpendicular to one another  
(c) Opposite to one another (d) Supporting one another

1.18. Vaccines and toxoids are precipitated and absorbed on to aluminium hydroxide or other suitable media.

This process results in a dosage form that in comparison to fluid forms

- (a) More effective orally
- (b) Absorbed slowly
- (c) Stability is increased
- (d) Irritation is lost

1.19. In order to produce characteristic pharmacological action, a drug must always

- (a) Reach high blood vessels
- (b) Absorbed from GIT readily
- (c) Achieve adequate concentration at the site of action
- (d) Excrete unchanged in urine.

1.20. The Wurster process can be used to

- (a) Coat tablets
- (b) Determine the disintegration time
- (c) Gas sterilize parenteral solutions
- (d) Automatic filling of capsules

## SECTION - II

### FILL IN THE BLANKS

#### Model Question

- 2.1. In multistation process, the portions of the head that hold the upper and lower punches are called the upper and lower \_\_\_\_\_ (1) \_\_\_\_\_ respectively.
- 2.2. In tablet disintegration test, the wire mesh of the tube at its lowest point is at least \_\_\_\_\_ (2) \_\_\_\_\_ mm above the bottom of the beaker.
- 2.3. Roller compactor is used in large scale \_\_\_\_\_ (3) \_\_\_\_\_ granulation.
- 2.4. Chemical name of Propellant 114 is \_\_\_\_\_ (4) \_\_\_\_\_.
- 2.5. In non-aqueous injection, Sesame oil and \_\_\_\_\_ (5) \_\_\_\_\_ oil are used as solvents.
- 2.6. 1-(p-chlorobenzoyl) 5-methoxy-2-methyl indole-3-acetic acid is commonly known as \_\_\_\_\_ (6) \_\_\_\_\_.
- 2.7. Rubidium chloride injection (contains Rb-86) is used to determine \_\_\_\_\_ (7) \_\_\_\_\_ blood flow.
- 2.8. Benzil on treatment with urea gives \_\_\_\_\_ (8) \_\_\_\_\_ which is an anticonvulsant.
- 2.9. Why Phenyl Malonamide on condensation with Formamide gives \_\_\_\_\_ (9) \_\_\_\_\_.
- 2.10. In the outer part of the \_\_\_\_\_ (10) \_\_\_\_\_ numerous ovoid Schizo-lysigenous oil glands are present in clove bud.
- 2.11. The brown seed of Nutmeg is surrounded by a crimson reticulate \_\_\_\_\_ (11) \_\_\_\_\_ which is stripped off and dried to form mace.
- 2.12. Terbutaline sulphate is a \_\_\_\_\_ (12) \_\_\_\_\_ agonist.
- 2.13. Salicylates and other anti-inflammatory drugs irreversibly inactivate the enzyme \_\_\_\_\_ (13) \_\_\_\_\_ responsible for the conversion of arachidonic acid to prostaglandin.
- 2.14. The temperature above which cloudiness suddenly appears for non-ionic surfactant in solution is known as \_\_\_\_\_ (14) \_\_\_\_\_.

- 2.15. Dragendorff's reagent used in testing alkaloids is chemically \_\_\_\_\_ (15) \_\_\_\_\_.
- 2.16. IR absorption spectra of aldehydes, ketones, carboxylic acids and their derivatives contain one absorption peak common due to \_\_\_\_\_ (16) \_\_\_\_\_.
- 2.17. When the molecular weight of a substance is unknown, the intensity of absorption is expressed as \_\_\_\_\_ (17) \_\_\_\_\_.
- 2.18. The frequency of rotating magnetic field and the frequency of the processing molecules become equal, they are said to be in \_\_\_\_\_ (18) \_\_\_\_\_.
- 2.19. A rod of silicon carbide 6-8 mm in diameter and 50 mm in length heated to a temperature of 1300°C gives \_\_\_\_\_ (19) \_\_\_\_\_ radiation. <http://www.xamstudy.com>
- 2.20. Osmotic pellets are extensively used as \_\_\_\_\_ (20) \_\_\_\_\_.

## PART - B

### STATE WHETHER THE FOLLOWINGS ARE TRUE OR FALSE

- 3.1. The chloro group in Chlorotetracycline is in the 8<sup>th</sup> position.
- 3.2. Ethacrynic acid is a high ceiling (loop) diuretic which inhibits electrolytic re-absorption in the thick ascending limb of the loop of Henle
- 3.3. Pharmaceutical Pectin differs from commercial Pectin because it does not contain sugar or organic acid.
- 3.4. Antihistamines stimulate the metabolism of endogenous histamine
- 3.5. Vitamin K appears to be compatible with mineral supplement such as Calcium and Iron.
- 3.6. Hepatic clearance is the sum of hepatic metabolic clearance and the biliary clearance.
- 3.7. The efficiency of a tumbling mixer is highly dependent on the speed of rotation.
- 3.8. Liquid glucose is obtained by complete hydrolysis of starch.
- 3.9. Ethylene oxide sterilization is suitable for rubber closures.
- 3.10. Samples can be handled in the form of solid, liquid or gas in mass spectrometry.
- 3.11. A photo cathode operates on the principle that electrons are emitted from certain material in direct proportion to the number of light quanta striking on the surface of the material
- 3.12. Purine occurs free in nature.
- 3.13. A guard column is used in HPLC to saturate the mobile phase with the stationary phase.
- 3.14. Balsams are resinous mixtures that contain large proportions of Benzoic acid, Cinnamic acid, Salicylic acid or esters of these acids.
- 3.15. The State Pharmacy Council is established by the State Drugs Controller.



#### 4. MATCH THE FOLLOWING :

4.1. Match the following descriptions given in (A) to (F) with the products mentioned below:

- |                |  |
|----------------|--|
| (1) Agar       | (A) Chief carbohydrate from <i>macrocystis pyrifera</i>                |
| (2) Carageenan | (B) Dried exudates from <i>Astragalus gummifera</i>                    |
| (3) Tragacanth | (C) Closely related hydrocolloids from <i>Chondrus crispus</i>         |
| (4) Algin      | (D) Hydrophilic collid from <i>Geledium cartilagenum</i>               |
|                | (E) Powdered endosperm of the seeds of <i>Cyamopsis tetragonolobus</i> |
|                | (F) Carbohydrates from the Rhizomes of <i>Zingiber sps.</i>            |
- (a) 1-D, 2-C, 3-B, 4-A  
(b) 1-A, 2-C, 3-D, 4-E  
(c) 1-A, 2-C, 3-E, 4-D  
(d) 1-A, 2-B, 3-C, 4-F

4.2. Listed are drugs 1 to 4. Their appropriate antihypertensive mechanisms are given in (A) to (F). Match them correctly.

- |               |   |
|---------------|---|
| (1) Pindalol  | (A) Vasodilator                                 |
| (2) Minoxidil | (B) Angiotensin converting enzyme inhibitor     |
| (3) Captopril | (C) Diuretic                                    |
| (4) Amiloride | (D) $\beta$ -blocker                            |
|               | (E) Centrally acting alpha adrenoceptor agonist |
|               | (F) Potassium induction                         |
- (a) 1-D, 2-B, 3-F, 4-A  
(b) 1-A, 2-C, 3-D, 4-E  
(c) 1-A, 2-C, 3-E, 4-D  
(d) 1-D, 2-A, 3-B, 4-C

4.3. Listed below are substances which are assayed by organisms mentioned in (A) to (E). Match them correctly.

- |                         |                           |
|-------------------------|---------------------------|
| (1) Crystal Violet I.P. | (A) Pasteurella pestis    |
| (2) Ampicillin I.P.     | (B) Bacillus cerus        |
| (3) Plague Vaccine I.P. | (C) Micrococcus luteus    |
| (4) Rifampicin I.P.     | (D) Staphylococcus aureus |
|                         | (E) Lactobacillus aureus  |
|                         | (F) Bacillus subtilis     |
- (a) 1-D, 2-C, 3-A, 4-F  
(b) 1-A, 2-C, 3-D, 4-E  
(c) 1-A, 2-C, 3-E, 4-D  
(d) 1-A, 2-B, 3-C, 4-F

4.4. Important Psychoactive Phenothiazines listed below have the following side chains at position 10, which are given in (A) to (F). Match them correctly.

- |                      |  |
|----------------------|--|
| (1) Chlorpromazine   | (a) 3-[4-methyl Piperazine 1-yl] Propyl            |
| (2) Prochlorperazine | (B) 2-[1 methyl Piperid 2-yl] ethyl                |
| (3) Thioridazine     | (C) 3-[4-(2 hydroxy ethyl) Piperazine 1-yl] propyl |



9. Write only the equations for the various steps involved in the assay of:
- (i) Ethosuximide I.P. (ii) Mephensin I.P.
10. Listed below are some important plant constituents. Give their chemical class and plant source.
- (i) Camphor (ii) Digitoxigenin  
 (iii) Hyoscine (iv) Xanthine  
 (v) Pilocarpine
11. What reaction/test you would perform to prove the following:
- (i) Nature and size of the ring of an alkaloid containing Pyridine nucleus  
 (ii) Steroidal ring in Cholesterol  
 (iii) Alpha, beta unsaturated lactone ring in Digitalis glycosides  
 (iv) 7-CH<sub>3</sub> group in caffeine molecule
12. Starting from the following, outline the synthesis of:
- (i) Mepyramine maleate from 4-Methoxy benzaldehyde  
 (ii) Cyproheptadine from 4-Chloro-1-methyl piperidine  
 Use any other reagent if needed.
13. Prepare a specimen label as per D and C act and rules for 0.5 mg BUSULPHAN tablets I.P. 10 × 10 Tablets - Dose 2 to 4 mg daily.
14. Draw the structures of the important metabolic products giving names of the transformation reaction.
- (i) Tolubutamide (ii) Phenobarbital  
 (iii) Chlorpromazine (iv) Imipramine  
 (v) Salicylic acid
15. Draw the heterocyclic system present in the following drugs:
- (i) Clonidine (ii) Cephalexin  
 (iii) Methaqualone (iv) Thiotepe  
 (v) Thiamine
16. Among the microscopical characteristics, the presence of different types of Calcium Oxalate crystals is an important diagnostic feature. Identify the correct type of Calcium Oxalate crystals present in the following drugs.
- (i) *Coca leaves* (ii) *Atropa belladonna leaves*  
 (iii) Mesophyls of *Urgineamaritima* (iv) *Daturastramonium leaves*  
 (v) *Ailanthus glandulosa*

17. Show the structural alteration in the compounds mentioned below and state what is the change in their activity?
- Introduction of F atom in the 5, position of URACIL
  - Introduction of a mercapto group in HYPOXANTHINE
  - Conversion of ISONIAZID to 2, 2 dimethyl hydrazide
  - Preparation of a heterocyclic analog of NICOTINAMIDE
  - One of the H atoms of the amino group of epinephrine is substituted by  $\text{CH}_3\text{CHCH}_3$
18. Suggest specific mechanism of action of the following. Answer should be in one sentence only.
- Erythromycin
  - Rifampin
  - Oxacillin
  - Nystatin
  - Cyclophosphamide
19. (i) Give the structural formulae of two stereoisomeric estradiols. Which is more potent?
- (ii) What do you infer from the following observation? Answer in one sentence. In the lycopodium method for the determination of total length of fibres in a sample of Cinnamon bark powder gave 27 to 40 to 50 m per gm of air dried powder.
- (iii) Two different Senna leaf samples A and B gave the following values. Include the sample to the appropriate variety of Senna.
- |                                   | <b>A</b>           | <b>B</b>           |
|-----------------------------------|--------------------|--------------------|
| Stomatal index<br>(both surfaces) | 17.1 to 18.7 to 20 | 11.4 to 12.2 to 13 |
| Vein islet number                 | 19 to 23           | 25 to 30           |
20. Give reasons for the following:
- A supporting electrolyte is added to a polarographic cell during analysis.
  - Conductivity of a solution is temperature dependent
  - In the assay of alkali metal salts of Carboxylic acid. Platinum crucibles are used and not porcelain crucibles.
  - Gas Chromatographic technique for pesticides, halogenated anesthetics etc., use an electron capture detector.
  - Flavones on boiling with KOH and treating with  $\text{FeCl}_3$  gives a violet colour.
21. (i) In aerosol technology, certain specialized equipments are used to identify the factors mentioned below. Name them.
- To determine the particle size
  - To determine the flash point
  - To identify the propellant
- (ii) A powder has volume of  $75 \text{ cm}^3$  and a bulk volume of  $125 \text{ cm}^3$ . Calculate its percentage porosity.

22. (i) The following Pharmaceutical aids have distinct disadvantages in their use. Name them in one or two sentences for each.
- (a) Parabens
  - (b) Cocoa butter
  - (c) Polyamide
- (ii) 10 ml ampoule of Potassium Chloride injection is available with labeled strength of 22.5 mEq/ml. But actual requirement is **175 ml** of 1 mEq/ml. How will you reconstitute?
23. Explain the following words and mention their significance in not more than two sentences for each.
- (i) Caramalisation
  - (ii) Phase inversion temperature
  - (iii) Solid fat index
  - (iv) Ferrule
  - (v) Case hardening
24. Give the principal function of the following equipments used in Pharmaceutical industry.
- (i) Pohlman whistle
  - (ii) Pycnometer
  - (iii) Monsanto tester
  - (iv) Breaking tester
  - (v) Oscillating granulator
25. During the manufacturing of the tablets, the following defects were noticed. Give reasons for these defects in one sentence for each.
- (i) Rat holing
  - (ii) Blistering
  - (iii) Hazing
  - (iv) Picking
  - (v) Double impression
26. Assign the main structural features of the compound  $C_8H_8O$  from the following IR absorption data:  $1450\text{ cm}^{-1}$ ,  $1265\text{ cm}^{-1}$ ,  $750\text{ cm}^{-1}$ ,  $1360\text{ cm}^{-1}$  and  $1680\text{ cm}^{-1}$ .
27. A Pharmaceutical formulation contains Zn, Mg and Cu ions. Suggest a suitable method to determine them without separation. <http://www.xamstudy.com>
28. What will be the adverse reactions, if the following drugs are administered together:
- (i) Rifampin and oral contraceptive
  - (ii) Tolbutamide and Sulphonamide
  - (iii) Levodopa and Vitamin B
  - (iv) Chloramphenicol and Phenobarbitone
  - (v) Erythromycin and Carbamazepine
29. Give answers in one or two sentences only.
- (i) Nalaxone is N-allyl derivative of Oxymorphone. How does it exert its action?
  - (ii) What is positive inotropic effect?
  - (iii) How does Verapamil, Nifedipine etc. act as a Calcium channel blocker?
  - (iv) How does Vinca alkaloids exert anticancer effects?
  - (v) What way the sulphonyl urea s exert their hypoglycemic effect?

**End of paper**



## ANSWER KEY GPAT 1995

### Section - I

1.1	a	1.2	a	1.3	d	1.4	a
1.5	c	1.6	c	1.7	b	1.8	c
1.9	d	1.10	b	1.11	b	1.12	a
1.13	b	1.14	c	1.15	a	1.16	b
1.17	c	1.18	b	1.19	c	1.20	a

### Section - IV

4.1	a	4.2	d	4.3	a	4.4	b
4.5	a						

# GPAT QUESTION PAPER 1994 WITH ANSWER KEY

## PHARMACEUTICAL SCIENCES

Time : 3 hours

Maximum Marks : 150

### PART - A

- N.B.**
- (1) There are 2 Section in this part.
  - (2) Answer all questions in both Section 1 and 2.
  - (3) Answer should be given in serial order in the answer book.
  - (4) Do not skip questions while writing the answers.
  - (5) Write the question number and show your answer by writing the alphabet (Against) in capital letters.
  - (6) In section 1 each question carries 1 mark.
  - (7) In section 3 each question carries 2 marks.
  - (8) A model is shown at the beginning of each section in part A.
  - (9) Answer to the question in this must be written in the first 3 (three) pages of the answer books only.

### SECTION - I

#### CHOOSE THE CORRECT ANSWER

#### Multiple choice Questions

- 1.1 Natural camphor is:
- An optically inactive aldehyde obtained from *cinnamomum camphora*
  - A white dextrorotatory ketone obtained from the wood of *cinnamomum camphora*
  - A white optically inactive ketone obtained form the bark of *cinnamomum camphora*
  - A white volatile aldehyde obtained from the bark of *cinnamomum camphora*
- 1.2 Ingredients used for capsulation in soft capsule should flow by gravity at a temperature Not exceeding
- |          |          |          |          |
|----------|----------|----------|----------|
| (a) 35°C | (b) 30°C | (c) 25°C | (d) 20°C |
|----------|----------|----------|----------|
- 1.3 The region of the electromagnetic spectrum below 200 nm is known as
- |                                |                      |
|--------------------------------|----------------------|
| (a) Vacuum ultra violet region | (b) Far uv region    |
| (c) Low uv region              | (d) Microwave region |
- 1.4 O/W micro emulsion containing hydrophilic surfactant produces
- |                          |                            |
|--------------------------|----------------------------|
| (a) Translucent emulsion | (b) Transparent emulsion   |
| (c) Milky white emulsion | (d) Intense white emulsion |

- 1.5 Which of the following steroids shows predominant mineralo corticoid action?
- (a) Hydrocortisone (b) Spironolactone  
(c) Dexamethasone (d) Fludrocortisone
- 1.6 The factors affecting diffusion current in polarography can be denoted by
- (a) Nernst equation (b) Ilkovic equation  
(c) Lambert's law (d) Mark-Houwink equation
- 1.7 Rotosort is an equipment used
- (a) To separate unfilled capsules  
(b) To fix the cap and body of the capsules after filling  
(c) To separate the improper tablets  
(d) To adjust the required compression for the tablets
- 1.8 As per G.M.P. permitted limit of slid contents in water for injection is:
- (a) 100 ppm (b) 1.0 ppm (c) 0.1 ppm (d) 10.0 ppm
- 1.9 Nujol is
- (a) Hexachlorobutadiene (b) Mineral oil  
(c) Perfluorokerosene (d) Flurolube
- 1.10 Which of the following is a microsomal enzyme inducer?
- (a) Indomethacin (b) Clofibrate (c) Tolbutamide (d) Glutethamide
- 1.11 Fiducial limit is a term used in
- (a) Microbiological assay (b) Biologically assay  
(c) Chemical assay (d) Instrumental methods of assay
- 1.12 Phenothiazines are metabolized
- (a) In the hepatic microsomal system by hydroxylation followed by conjugation with glucuronic acid  
(b) In the liver by oxidation  
(c) In the hepatic microsomal system by reduction  
(d) In the hepatic microsomal system by oxidation followed by conjugation with glycine.
- 1.13 Benzodiazepines potentiate
- (a) The binding of protein to nervous tissue (b) The binding of GABA to liver  
(c) The binding of GABA to receptors (d) The binding of GABA to carbohydrates
- 1.14 Benzalkonium chloride is a germicidal surfactant which is rendered inactive in the presence of
- (a) Organic acid (b) Cationic surfactants (c) Soaps (d) Inorganic salts
- 1.15 Enkephalins are
- (a) Exogenous compounds useful in Analgesia  
(b) Endogenous ligands which are pentapeptides that are localized in some nerve endings.  
(c) Endogenous ligands which are tripeptides that are present in nervous tissue  
(d) Endogenous ligands which are tetrapeptides that are present in cardiovascular tissue.

1.16 Benorylate is a Prodrug, chemically it is polymeric condensation product of

- (a) Aluminium oxide and aspirin (b) An acetyl salicylic ester of phenol  
(c) An acetyl salicylic ester of paracetamol (d) An acetyl salicylic ester of  $\beta$ -naphthol

1.17 Listed below are some of the common vehicles, which one is most appropriate for the intravenous admixture of ampicillin 500 mg/50 ml?

- (a) 5% Dextrose injection  
(b) 5% Dextrose and 0.9% Sodium Chloride solution  
(c) 2.5% Dextrose and 0.45% Sodium Chloride injection  
(d) 0.9% Sodium Chloride injection

1.18 Acetonides are prepared to improve the bioavailability of certain drugs. Which of the following is available as acetonide?

- (a) Clonidine (b) Prednisolone (c) Pyrimethamine (d) Trametinolone

1.19. Which one of the following indicators is used in Complexometric Titration?

- (a) Crystal Violet (b) Murexide (c) Eosin (d) Methyl Orange

1.20. Betamethasone is:

- (a)  $9\alpha$  Fluro 11  $\beta$ , 17  $\alpha$ , 21 trihydroxy 16  $\beta$  methyl pregna-1, 4 diene 3, 20 dione  
(b)  $9\alpha$  Fluro 12  $\beta$ , 13  $\alpha$ , 21 trihydroxy 17  $\beta$  methyl pregna-1, 4 diene 3, 20 dione  
(c)  $9\alpha$  Fluro 11  $\beta$ , 17  $\alpha$ , 21 trihydroxy 16  $\beta$  methyl estra-1, 4 diene 3, 20 dione  
(d)  $9\alpha$  Fluro 11  $\beta$ , 17  $\alpha$ , dihydroxy 16  $\beta$  methyl pregna-1, 4 diene 3, 20 dione

## SECTION - II

### 2. FILL IN THE BLANKS

- (A) The anti-inflammatory agent sulindac has the closest structural similarity to \_\_\_\_\_.
- (B) A long polypeptide which possesses potent analgesic activity and found in the Pituitary and hypothalamus is \_\_\_\_\_.
- (C) Aminophylline I.P. contains Theophylline and \_\_\_\_\_.
- (D) Radiopharmaceuticals are filled up in suitable containers in a protected \_\_\_\_\_ laminar flow cabinet.
- (E) Efficiency of a filter used for sterilization is determined by its \_\_\_\_\_.
- (F) The finger print region in IR spectrum ranges from \_\_\_\_\_  $\text{cm}^{-1}$ .
- (G) \_\_\_\_\_ is the ideal micro-encapsulation process for thermostable ingredients
- (H) Spinning of a nucleus perpendicular to the applied field is known as \_\_\_\_\_.
- (I) The test organism for the microbiological assay of chloramphenicol IP is \_\_\_\_\_.
- (J) Spiranolactone is a competitive antagonist of \_\_\_\_\_.
- (K) Cokchicine is an alkaloid obtained from \_\_\_\_\_.

- (L) A typical auxin of plant, which is found in growing tissue is \_\_\_\_\_.
- (M) The largest peak in the mass spectrum is known as \_\_\_\_\_.
- (N) Procainamide when given intravenously can cause a drop in blood pressure probably from \_\_\_\_\_.
- (O) The most important property of Digitalis glycosides is their positive \_\_\_\_\_.
- (P) In non-aqueous titration of amine halides, the halide ion is removed by the addition of \_\_\_\_.
- (Q) Milk of Magnesia is a preparation containing between 7 and 8.5% of \_\_\_\_\_.
- (R) Light-liquid paraffin IP and Liquid paraffin IP is differentiated by their \_\_\_\_\_.
- (S) Papain is a \_\_\_\_\_ enzyme.
- (T) The systematic name of \_\_\_\_\_ is L-threo-2,3,4,5,6-penta hydroxy-2-hexenoic acid-4-lactone.

### SECTION - III

3. State whether the following are TRUE or FALSE. If the statements are FALSE, correct them . Give reasons and justify the statements in one or two sentences only.

- (A) Quinidine is often given intra-muscularly
- (B) Micropore cellulose membrane filters are disposed after use by burning.
- (C) The glass electrode used in potentiometry should not be used in aqueous media.
- (D) Lidocaine can be given by continuous intravenous infusion.
- (E) Acetazolamide is a sulfonamide type drug used as anti-bacterial.
- (F) Liquids containing water above 5% and low molecular weight water soluble organic compounds are not encapsulated in soft gelatin capsules. <http://www.xamstudy.com>
- (G) Neutral molecules produced in the fragmentation cannot be detected in the mass spectrometer.
- (H) Stable and metastable polymorphs are only included in the preparation of chloramphenicol suspension.
- (I) Dimethyl sulphoxide is used as permeation inhibitor in transdermal preparations.
- (J) The main oxidation product of  $\beta$  carotene is 2 molecular portion of geronic acid hence it shows the presence of a ionone ring structure.
- (K) Thymol and menthol gives a violet colour reaction with neutral ferric chloride solution.
- (L) Dry mixtures are the common pediatric dosage forms, because of their extended half life.
- (M) The reversible oxidation and reduction system of Ascorbic acid accounts for its biologic function.
- (N) Digitalis leaves, after collection should be dried as rapidly as possible at a temperature of about 60°C.
- (O) The process of gel filtration involves separation of materials on the basis of particle size.



## SECTION - IV

### MATCH THE FOLLOWING

4.1 The biological indicators mentioned below are used for specific type of sterilization listed (A) to (E).

Match them.

- |  |                              |
|--|------------------------------|
| (1) <i>Bacillus subtilis</i>           | (A) Ionising radiaton        |
| (2) <i>Bacillus stearothermophilus</i> | (B) Dry heat st erilization  |
| (3) <i>Bacillus pumulis</i>            | (C) Filtration               |
| (4) <i>Pseudomonas diminuta</i>        | (D) Moist heat sterilization |
|  | (E) Gaseous sterlization     |
| (a) 1-B, 2-A, 3-C, 4-D                 | (b) 1-B, 2-D, 3-A, 4-C       |
| (c) 1-E, 2-A, 3-B, 4-C                 | (d) 1-B, 2-C, 3-E, 4-A       |

4.2 Following are some of the starting materials for the synthesis of compounds listed from (A) to (E). Match them correctly.

- |   |                         |
|---|-------------------------|
| (1) $\gamma$ - Picoline                       | (A) Diethyl Carbamazine |
| (2) 4-Nitro 2-Amino Toluene                   | (B) Isoniazid           |
| (3) Piperazine and Diethyl Carbamoyl Chloride | (C) Chlorpromazine      |
| (4) 2-Chloro Phenothiazine                    | (D) Diltiazem           |
|   | (E) P.A.S.              |
| (a) 1-B, 2-A, 3-C, 4-D                        | (b) 1-A, 2-B, 3-D, 4-C  |
| (c) 1-B, 2-A, 3-A, 4-C                        | (d) 1-B, 2-C, 3-E, 4-A  |

4.3 Microscopical characters (A) to (E) are associated with the plant drugs listed below. Match them.

- |                                 |                                      |
|---------------------------------|--------------------------------------|
| (1) <i>Elettaria cardamomum</i> | (A) Rhytidomes                       |
| (2) <i>Quillaia saponaria</i>   | (B) Clothing and glandular trichomes |
| (3) <i>Digitalis purpurea</i>   | (C) Thin membraneous arillus         |
| (4) <i>Atropa belladonna</i>    | (D) Stomata of the anisocytic type   |
|                                 | (E) Concave midrib                   |
| (a) 1-C, 2-A, 3-B, 4-D          | (b) 1-A, 2-B, 3-D, 4-C               |
| (c) 1-E, 2-A, 3-B, 4-C          | (d) 1-B, 2-C, 3-E, 4-A               |

4.4 The equipment listed (A) to (E) are used for the identification of the properties of aerosol mentioned below. Match them.

- |                                   |                            |
|-----------------------------------|----------------------------|
| (1) Particle size determination   | (A) Pycnometer             |
| (2) Identification of propellants | (B) Rotational viscometer  |
| (3) Stability of foam             | (C) Tag open cup apparatus |
| (4) Flash point                   | (D) Infrared spectroscopy  |
|                                   | (E) Cascade impactor       |
| (a) 1-B, 2-A, 3-C, 4-D            | (b) 1-A, 2-B, 3-D, 4-C     |
| (c) 1-E, 2-D, 3-B, 4-C            | (d) 1-B, 2-C, 3-E, 4-A     |

4.5 Match the terms mentioned from (A) to (E) with the corresponding spectroscopic methods.

- |                        |                            |
|------------------------|----------------------------|
| (1) IR                 | (A) Antibonding orbital    |
| (2) Mass Spectra       | (B) Stretching and bending |
| (3) NMR                | (C) Metastable ion         |
| (4) UV                 | (D) Chemical shift         |
|                        | (E) Depolarisation         |
| (a) 1-B, 2-A, 3-C, 4-D | (b) 1-A, 2-B, 3-D, 4-C     |
| (c) 1-E, 2-A, 3-B, 4-C | (d) 1-B, 2-C, 3-D, 4-A     |

4.6 Pharmacological activity of certain well known plant drugs are listed (A) to (E). Match them.

- |                        |                             |
|------------------------|-----------------------------|
| (1) Papaverine         | (A) Weak analeptic          |
| (2) Camphor            | (B) Vasodilator             |
| (3) Veratrum alkaloids | (C) Antineoplastic          |
| (4) Vincristine        | (D) Central vasoconstrictor |
|                        | (E) Anxiolytic              |
| (a) 1-B, 2-A, 3-C, 4-D | (b) 1-B, 2-A, 3-B, 4-C      |
| (c) 1-E, 2-A, 3-B, 4-C | (d) 1-B, 2-C, 3-E, 4-A      |

4.7 Given below are some of the common reactions. Their definitions are listed (A) to (E). Match them.

- |                        |  |
|------------------------|--|
| (1) Saponification     | (A) Reaction of acids and bases to form salt and water                       |
| (2) Esterification     | (B) Reaction of an oil with an alkali to form soap and glycerol              |
| (3) Neutralisation     | (C) Reaction in which hydrogen atoms are added to double bonds               |
| (4) Hydrolysis         | (D) Reaction in which hydroxyl group is replaced by alkoxy group             |
|                        | (E) Reaction of salt or ester with water to form acids and bases or alcohol. |
| (a) 1-B, 2-D, 3-A, 4-E | (b) 1-A, 2-B, 3-D, 4-C   |
| (c) 1-E, 2-A, 3-B, 4-C | (d) 1-B, 2-C, 3-E, 4-A   |

4.8 Listed below are some of important drugs. Classify them as per the relevant Schedules of Drugs and Cosmetics Act

- |                            |                        |
|----------------------------|------------------------|
| (1) Chlorpropamide         | (A) Schedule G         |
| (2) Detamethasone benzoate | (B) Schedule M         |
| (3) Amaranth               | (C) Schedule H         |
| (4) Dexamphetamine         | (D) Schedule Q         |
|                            | (E) Schedule X         |
| (a) 1-B, 2-A, 3-C, 4-D     | (b) 1-A, 2-B, 3-D, 4-C |
| (c) 1-E, 2-A, 3-B, 4-C     | (d) 1-A, 2-C, 3-D, 4-E |

4.9 Match the coatings given below with their corresponding techniques listed (A) to (E).

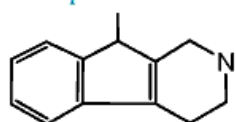
- |                         |  |
|-------------------------|--|
| (1) Compression coating | (A) Air in the coating pan is replaced with nitrogen |
|-------------------------|--|

- |                           |   |
|---------------------------|---|
| (2) Dip Coating           | (B) Application of coating to conductive substrates |
| (3) Electrostatic Coating | (C) Acid insoluble coating                          |
| (4) Vacuum Film coating   | (D) A tablet within a tablet                        |
|                           | (E) Repeated coating and drying                     |
| (a) 1-E, 2-E, 3-B, 4-A    | (b) 1-A, 2-B, 3-D, 4-C                              |
| (c) 1-E, 2-A, 3-B, 4-C    | (d) 1-B, 2-C, 3-E, 4-A                              |

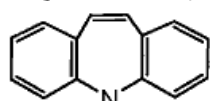
4.10 The most appropriate pharmacological actions of the following drugs are listed in (A) to (E). Match them.

- |                        |                                     |
|------------------------|-------------------------------------|
| (1) Verapamil          | (A) Calcium channel blocker         |
| (2) Propranolol        | (B) Coronary vasodilator            |
| (3) Dipyridamole       | (C) $\beta$ -Adrenergic blocker     |
| (4) Hydralazine        | (D) Arteriolar vasodilator          |
|                        | (E) Arterial and venous vasodilator |
| (a) 1-B, 2-A, 3-C, 4-D | (b) 1-A, 2-C, 3-B, 4-D              |
| (c) 1-E, 2-A, 3-B, 4-C | (d) 1-B, 2-C, 3-E, 4-A              |

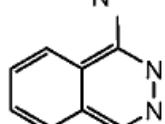
5. Following ring structures are present in well known drugs or their pharmacological category is indicated. Complete the structure by introducing the relevant groups and their common name?



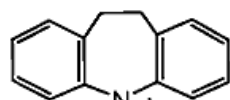
an antihistaminic



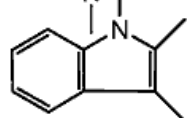
Analegestic specific in trigeminal neuralgia



Antihypertensive



Antidepressant



Antiinflammatory Analgesic

6. Give the names of five important factors which protect the chemical stability of medicaments in parenterals.

7. Give reasons for the following:

- Temperature programming gives the best result in gas chromatography.
- The detectors used in U.V. and visible region cannot be used in longer wave length.
- In polarographic analysis expelling dissolved oxygen by passing of inert gas is done before the actual measurement.
- Phenol and anisole fluorescence at pH 7, but at pH 12 Phenol does not show fluorescence.
- Buffered solution is always used in E.D.T.A. titrations.

8. Draw inferences for the following:
- Microscopic examination of powdered digitalis leaves showed small leaf parts with densely covered large wooly hairs.
  - Two different samples of squill . One gives reddish purple colour with iodine and another pale yellow colour.
  - A transverse section of Belladonna root sample showed number of concentric cambia, Parenchyma showed acicular calcium oxalate crystals.
  - To an alkaloidal salt solution in water bromine water and dilute ammonia solution are added - a bright green colour is produced.
  - An alkaloid when treated with p-dimethyl amino benzaldehyde reagent in presence of  $H_2SO_4$  and traces of Ferric chloride gives blue violet colour.
9. Give the mechanism of action of the following drugs. Answer each in not more than two sentences.
- Nifedipine
  - Hexamethonium
  - Interferons
  - Pyrantel pamoate
  - Erythromycin

### PART - B

10. Draw the heterocyclic system present in the drugs listed below and name them:
- |                    |                  |               |
|--------------------|------------------|---------------|
| (A) Nitrofurantoin | (B) Cloxacillin  | (C) Primidone |
| (D) Mebendazole    | (E) Methotrexate |               |
11. Give reasons for the following:
- Using opaquent-extenders in film-coating of tablets.
  - Elevation of storage temperature in Accelerated stability studies.
  - Grossing in syrup coating
  - Application of Stoke's law in emulsion preparation
12. Mention 5 important factors for selection of Fluid Bed Spray Granulator.
13. (A) Draw the configurational, boat and chair structures of:
- $3\alpha$  Hydroxy tropane
  - $3\beta$  Hydroxy tropane
  - 6, 7 $\beta$  Epoxy- $3\alpha$ -hydroxy tropane
- (B) Adult dose of a drug is 150 mg/kg and the drug is available as tablets of 2 mg strength. Calculate the requirement for a boy aged 14 years, weighing 35 kg.
14. (A) When was Pharmacy Act passed?
- (B) Define the following as per Pharmacy Act.
- Central Register
  - First Register
  - Education Regulation
  - Schedule F

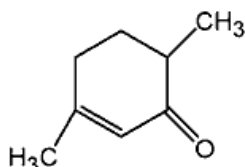
15. Give the names and chemical nature of the principal constituents present in the volatile of

- (A) *Coriandrum sativum* (B) *Carum carvi*  
(C) *Pimpinella anisum* (D) *Myristica fragrans*  
(E) *Anethum graveolens*

16. (A) Define:

- (i) Chromophore  
(ii) Equivalent Conductance

(B) What is  $\lambda_{\max}$ ? How  $\lambda_{\max}$  in the following structure is calculated?



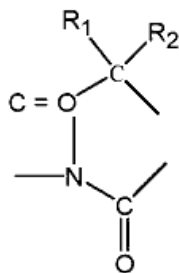
17. (A) Name 4 important additives used in the formulation of hard gelatin capsule.

(B) What peak plasma concentration might be obtained by administering 60 mg of a drug ( $V_d = 0.4$  l/kg) to a boy weighing 40 kg.

18. The MAO inhibitors form stable complexes with monoamine oxidase, irreversibly inactivating it and thereby preventing the oxidative deamination of biogenic amines. Name 5 of these biogenic amines.

19. Give the principle, with relevant equations of the reactions involved and the method of assay of Amylobarbitone IP. <http://www.xamstudy.com>

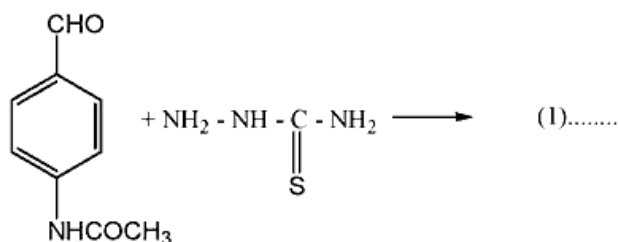
20. Anti convulsants containing the ureide structure is depicted by the common formula given below. Different classes of these compounds have different groups which are missing in the structure, enter them and give their names.



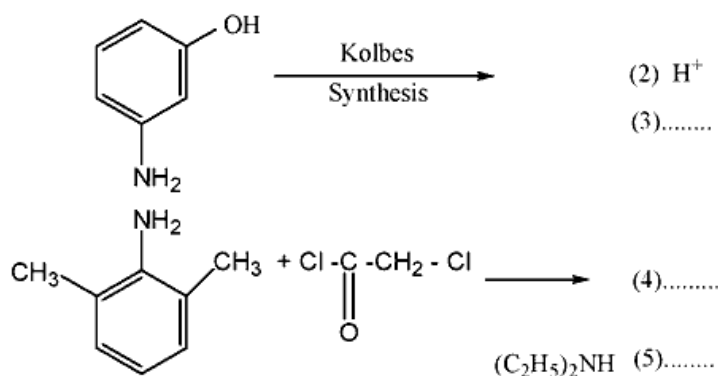
21. Show the structural alternation in the compounds mentioned, state what improvement in their activity is resulted.

- (i) Introduction of ethinyl group at  $C_{17}$  in Estradiol.  
(ii) Attachment of tertiary amino group to the 4<sup>th</sup> carbon of the butyrophenone.  
(iii) Introduction of 3, 5 dimethoxy-4-ethoxy carbohydroxy group at  $C_{18}$  in Reserpine.  
(iv) Introduction of chloro group at 7 position of 1:3 dihydro-1- methyl, 5, phenyl 2H, 1-4 benzodiazepine 2-one.

22. Complete the following reactions given the name and structural formula of the final product.







23. Give the mechanism of action of osmotic diuretics.

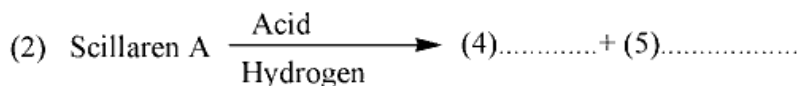
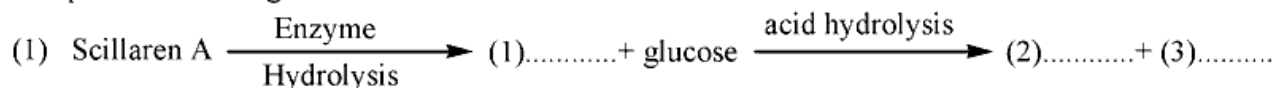
24. What happens when? Give complete equations.

- (i) Succinaldehyde, methylamine and acetone are condensed at room temperature.
- (ii) Chloramphenicol (?) is hydrolyzed, the resulting product is oxidized with periodate.

25. Starting from the following, outline the synthesis of:

- (i) Bephenium hydroxyl naphthoate from 1-Chloro-2-phenoxy ethane.
- (ii) trimethoprim from trimethoxy benzaldehyde and 3 ethoxy-propionitrile.

26. Complete the following reaction:



27. Draw the structural formula for the following:

- (i) Methyl 11, 17 $\alpha$  dimethoxy 18 $\beta$  (3, 4, 5 trimethoxy benzoyloxy) 3  $\beta$ , 20 $\alpha$  – Yohimbane - 16  $\beta$  carboxylate.
- (ii) 3, 7 dihydro-1, 3, 7 trimethyl purine 2, 6 dione
- (iii) 4-Chloro-N-fufuryl-5-sulphamoyl anthranilic acid
- (iv) 11 $\beta$ , 17 $\alpha$ , 21 trihydroxypregna-14-diene-3, 20-dione.
- (v) N-(5-methyl isoxazol-3-yl) Sulphanilamide.

28. List the important parts of a UV double beam spectrophotometer and mention their Functions

29. Show how the following drugs are transformed. Name their metabolic product:

- |                      |                         |           |
|----------------------|-------------------------|-----------|
| (i) Meprobamate      | (ii) Salicylic acid     | (iii) INH |
| (iv) Nor-epinephrine | (v) Glyceryl trinitrate |           |

**End of paper**

## ANSWER KEY GATE 1994

### Section - I

1.1	b	1.2	a	1.3	b	1.4	b
1.5	d	1.6	b	1.7	a	1.8	d
1.9	b	1.10	d	1.11	a	1.12	a
1.13	c	1.14	c	1.15	b	1.16	c
1.17	d	1.18	d	1.19	b	1.20	a

### Section - IV

4.1	b	4.2	c	4.3	a	4.4	c
4.5	d	4.6	b	4.7	a	4.8	d
4.9	a	4.10	b				

# GPAT QUESTION PAPER 1993 WITH ANSWER KEY

## PHARMACEUTICAL SCIENCES

Time : 3 hours

Maximum Marks : 200

### PART - A

- N.B.
- (1) *There are 2 Section in this part.*
  - (2) *Answer all question in both Section 1 and 2.*
  - (3) *Answer should be given in serial order in the answer book.*
  - (4) *Do not skip questions while writing the answers.*
  - (5) *Write the question number and show your answer by writing the alphabet (Against) in capital letters.*
  - (6) *In section 1 each question carries 1 mark.*
  - (7) *In section 3 each question carries 2 marks.*
  - (8) *A model is shown at the beginning of each section in part A.*
  - (9) *Answer to the question in this must be written in the first 3 (three) pages of the answer books only.*

### SECTION - I

#### CHOOSE THE CORRECT ANSWER

#### Multiple choice Questions

- 1.1 Triamcinolone is
- |   |  |
|---|--|
| (a) 9 $\alpha$ -Fluoro-16 $\alpha$ -hydroxyprednisolone | (b) 9 $\beta$ -Fluoro-16 $\alpha$ -hydroxyprednisolone |
| (c) 9 $\alpha$ -Fluoro-16 $\beta$ -hydroxyprednisolone  | (d) 9 $\alpha$ -Bromo-16 $\alpha$ -hydroxyprednisolone |
- 1.2 Surfactants are characterized by the presence of
- Water solubilising groups alone
  - Fat solubilizing groups alone
  - Water and fat solubilising groups in the same molecule
  - Groups with positive charge
- 1.3 Gamma-globulin is separated from serum by
- |                   |              |                    |                 |
|-------------------|--------------|--------------------|-----------------|
| (a) Agglutination | (b) Dialysis | (c) Centrifugation | (d) Salting out |
|-------------------|--------------|--------------------|-----------------|
- 1.4 The stationary phase in Thin-layer chromatograph is:
- |                               |                       |
|-------------------------------|-----------------------|
| (a) Liquid held between glass | (b) Silica gel        |
| (c) Glass Plate               | (d) None of the above |
- 1.5 Benzoyl peroxide is
- |                   |                  |                    |                   |
|-------------------|------------------|--------------------|-------------------|
| (a) An astringent | (b) An emollient | (c) A preservative | (d) A keratolytic |
|-------------------|------------------|--------------------|-------------------|

1.6 Water for injection differs from sterile distilled water as it is free from

- (a) Carbon dioxide      (b) Pyrogens      (c) Preservatives      (d) Antioxidant

1.7 The correct equivalent for  $-10^{\circ}\text{C}$  is:

- (a)  $-10^{\circ}\text{F}$       (b)  $+22^{\circ}\text{F}$       (c)  $-18^{\circ}\text{F}$       (d)  $+14^{\circ}\text{F}$

1.8 The active metabolite of anti-cancer cyclophosphamide is:

- (a) N - hydroxyl cyclophosphamide      (b) N - methyl cyclophosphamide  
(c) 4 - hydroxyl cyclophosphamide      (d) N - acetyl cyclophosphamide

1.9 Mebandazole, an anthelmintic drug, has one group at 5-position in the benzimidazole structure. It is

- (a)  $-\text{S}-\text{CH}_2-\text{CH}_2-\text{CH}_3$       (b)  $-\text{S}-\text{Ph}$   
(c)  $\text{Ph}-\text{SO}_2-$       (d)  $\text{Ph}-\text{CO}-$

1.10 Sedative action of barbiturates is due to substituents at  $\text{C}_5$ . It is due to .

- (a) High lipophilicity of groups at C position      (b) Electronic withdrawing effect  
(c) Steric effect      (d) Metal chelation

1.11 Monoamine oxidase (MAO) inhibitors have serious side effects and toxicities. The alternate drugs of choice are

- (a) Tricyclic antidepressants      (b) Hallucinogens  
(c) Amphetamines      (d) Xanthine alkaloids

1.12 Sterility test for the materials meant for surgical suture requires incubation for

- (a) 7 days      (b) 14 days      (c) 21 days      (d) 28 days

1.13 Silver-Silver chloride electrode consists of

- (a) Silver wire coated with calomel      (b) Silver wire coated with potassium chloride  
(c) Silver wire coated with silver chloride      (d) Platinum wire coated with silver chloride

1.14 Extinction  $E =$

- (a)  $\log(I_0/I_t)$       (b)  $\log T$       (c)  $I_t/I_0$       (d)  $I_0 10^{-ct}$

1.15 Senna leaf I.P. consists of

- (a) Dried leaflets of *Cassia acutifolia* and *Cassia angustifolia*  
(b) Dried leaflets of *Cassia indica*  
(c) Dried leaflets of *Cassia carpinifolia*  
(d) Dried leaflets of *Cassia carpinifolia* and *Cassia acutifolia*

1.16 Conformational isomerism is:

- (a) Cis-trans isomerism  
(b) Optical isomerism  
(c) Dextro-and levo-rotatory  
(d) Non-Identical spatial arrangement of atoms in molecules resulting from rotation about one or more simple bonds

1.17 According to pH partition theory, a weakly acidic drug will most likely be absorbed from the stomach because the drug which exist primarily in the

- (a) Un-ionised, more lipid soluble form
- (b) Ionised, more water soluble form
- (c) Form of weak acid and more soluble in acid media
- (d) Ionic form of the drug which facilitates diffusion

1.18 Blood flow through a capillary is described by one of the following equations. Choose the correct one.

- (a) Langmuir
- (b) Noyes Whitney
- (c) Hildebrand
- (d) Stokes

1.19. Ionic mobility is denoted by

- (a) cm/sec
- (b) Degree celcius/sec
- (c) mg/sec
- (d) None of the above

1.20. A mixture of hydrochloric acid and acetic acid can be titrated satisfactorily by

- (a) Potentiometry
- (b) Conductometry
- (c) Amphrometry
- (d) Spectrophotometry

## SECTION - II

### MATCH THE FOLLOWING

2.1 The drugs and their mechanism of action are listed below. Match them.

- |   |                        |
|---|------------------------|
| (1) $\text{Ca}^{2+}$ channel blockers     | (A) Terbutaline        |
| (2) $\beta_2$ - selective bronchodilators | (B) Diltiazim          |
| (3) 5-HT antagonist                       | (C) Ranitidine         |
| (4) $\text{H}_2$ - receptor antagonist    | (D) Cyproheptadine     |
|   | (E) Omeprazole         |
| (a) 1-B, 2-A, 3-D, 4-C                    | (b) 1-A, 2-D, 3-C, 4-B |
| (c) 1-B, 2-A, 3-D, 4-C                    | (d) 1-B, 2-A, 3-C, 4-D |

2.2. The injections mentioned below are usually sterilized by the process of (A) to (E). Match them.

- |                                      |   |
|--------------------------------------|---|
| (1) Hydrocortisone acetate injection | (A) Sterilization by dry heat                 |
| (2) Morphine injection               | (B) Sterilization by moist heat               |
| (3) Parakehyde injection             | (C) Sterilization by filtration               |
| (4) Phenol and Glycerine injection   | (D) Sterilization by heating with bactericide |
|                                      | (E) Asceptic operation                        |
| (a) 1-B, 2-A, 3-D, 4-C               | (b) 1-B, 2-A, 3-C, 4-D                        |
| (c) 1-E, 2-D, 3-C, 4-A               | (d) 1-A, 2-C, 3-B, 4-D                        |

2.3. The side chain structure for the following drugs are given from (A) to (E). Match them.

- |   |                    |
|---|--------------------|
| (A) $\text{—O—CH}_2\text{—CH(OH)—CH}_2\text{—NHCH(CH}_3)_2$ | (1) Primaquine     |
| (B) $\text{—CH}_2\text{—CH}_2\text{—CH}_2\text{—N(CH}_3)_2$ | (2) Chlorpromazine |





2.7. The following are the test animals or substances used for the biological assay of the preparations listed in (A) to (D). Match them.

- |                        |                                    |
|------------------------|------------------------------------|
| (1) Mice               | (A) Vasopressin                    |
| (2) Albino rats        | (B) Diphtheria antitoxin           |
| (3) Guinea pigs        | (C) Insulin                        |
| (4) Sheep plasma       | (D) Human antihaemophilic fraction |
| (a) 1-B, 2-A, 3-D, 4-C | (b) 1-D, 2-B, 3-D, 4-C             |
| (c) 1-B, 2-A, 3-C, 4-D | (d) 1-C, 2-A, 3-B, 4-D             |

2.8. The active form of the enantiomer for the following drugs are given in (A) to (E). Match them.

- |                        |                        |
|------------------------|------------------------|
| (1) Ibuprofen          | (A) S - isomer         |
| (2) Ephedrine          | (B) D - isomer         |
| (3) Propranolol        | (C) cis - isomer       |
| (4) Ethambutol         | (D) L - isomer         |
|                        | (E) R - isomer         |
| (a) 1-B, 2-E, 3-D, 4-C | (b) 1-A, 2-D, 3-E, 4-B |
| (c) 1-A, 2-B, 3-E, 4-D | (d) 1-A, 2-B, 3-E, 4-D |

2.9. The ingredients mentioned in (A) to (E) are used in various stages of sugar coating of tablets. Match them.

- |                        |                        |
|------------------------|------------------------|
| (1) Seal coating       | (A) Gelatin            |
| (2) Sub coating        | (B) Carnauba wax       |
| (3) Syrup coating      | (C) Methanol           |
| (4) Polishing          | (D) PEG 4000           |
|                        | (E) Cane sugar         |
| (a) 1-D, 2-A, 3-E, 4-B | (b) 1-A, 2-C, 3-E, 4-D |
| (c) 1-A, 2-B, 3-E, 4-C | (d) 1-A, 2-C, 3-E, 4-D |

2.10. The drugs a to e are used as diuretics. Match them to their classes.

- |                                |                           |
|--------------------------------|---------------------------|
| (1) Osmotic diuretic           | (A) Spironolactone        |
| (2) Loop diuretic              | (B) Isosorbide            |
| (3) Potassium sparing diuretic | (C) Merasaly Theophylline |
| (4) Organomercurial diuretic   | (D) Furosemide            |
|                                | (E) Probenecid            |
| (a) 1-B, 2-A, 3-D, 4-C         | (b) 1-B, 2-D, 3-A, 4-C    |
| (c) 1-C, 2-C, 3-A, 4-D         | (d) 1-A, 2-D, 3-C, 4-B    |

2.11. The following bacteria are classified based on their staining (A) to (E). Match them.

- |                                   |                            |
|-----------------------------------|----------------------------|
| (1) <i>Clostridium tetani</i>     | (A) Gram-positive cocci    |
| (2) <i>Escherichia coli</i>       | (B) Gram-positive bacilli  |
| (3) <i>Neisseria gonorrhoeae</i>  | (C) Gram-negative cocci    |
| (4) <i>Streptococcus pyogenes</i> | (D) Gram-negative bacilli  |
|                                   | (E) Gram-positive spirilla |

- (a) 1-B, 2-A, 3-D, 4-C  
 (b) 1-A, 2-D, 3-C, 4-B  
 (c) 1-D, 2-A, 3-C, 4-B  
 (d) 1-B, 2-D, 3-C, 4-A

2.12. The following prefixes are to identify the characteristics listed in (A) to (E). Match them.

- (1) Hetero (A) Neighbouring positions in the benzene ring  
 (2) Levo (B) Rotates the polarized light to the left  
 (3) Ortho (C) Several identical molecules linked together  
 (4) Poly (D) Not all the same atoms in the ring  
 (E) Water is removed from the compound
- (a) 1-B, 2-A, 3-D, 4-C (b) 1-A, 2-D, 3-B, 4-C  
 (c) 1-A, 2-C, 3-B, 4-D (d) 1-D, 2-B, 3-A, 4-C

2.13. The following Umbelliferous fruits are obtained from the plants mentioned in (A) to (E). Match them.

- (1) Anise seed (A) *Anethum graveolens*  
 (2) Caraway (B) *Foeniculum vulgare*  
 (3) Coriander (C) *Carum carvi*  
 (4) Dill (D) *Pimpinella anisum*  
 (E) *Coriandrum sativum*
- (a) 1-B, 2-E, 3-D, 4-C (b) 1-E, 2-B, 3-A, 4-D  
 (c) 1-D, 2-C, 3-E, 4-A (d) 1-A, 2-B, 3-E, 4-D

2.14. The drugs listed from 1 to 4 are having the antihypertensive mechanism listed in (A) to (E). Match them correctly.

- (1) Pindolol (A) Vasodilator  
 (2) Minoxidil (B) Centrally acting  $\alpha_2$ -adrenoreceptor agonist  
 (3) Captopril (C) Diuretic  
 (4) Amiloride (D) Beta-blocker  $\beta_3$   
 (E) Angiotensin converting enzyme inhibitor
- (a) 1-B, 2-C, 3-D, 4-E (b) 1-D, 2-A, 3-E, 4-C  
 (c) 1-C, 2-B, 3-E, 4-D (d) 1-E, 2-B, 3-C, 4-A

2.15. A drug is deemed to be as indicated in 1 to 4 and the corresponding definitions are given in (A) to (E). Match with the correct ones.

- (1) Misbranded drug (A) If it is marketed without prescription  
 (2) Adulterated drug (B) If it is imported under a name which belongs to another drug  
 (3) Spurious drug (C) If it is not labeled in the prescribed manner  
 (4) Drug of abuse (D) If it contains any harmful or toxic substance  
 (E) If it develops addiction
- (a) 1-B, 2-A, 3-D, 4-C (b) 1-C, 2-B, 3-E, 4-C  
 (c) 1-C, 2-D, 3-B, 4-E (d) 1-E, 2-B, 3-A, 4-C

### SECTION - III

#### FILL IN THE BLANKS

- (A) Synthetic camphor is optically .....1..... and is prepared from.....2.....whereas natural camphor is optically .....3..... and is obtained from.....4.....
- (B) Alkaloids of ergot exist in stereoisomeric pairs and they are derived from optically isomeric forms. They are known as .....5..... and .....6..... which differ only in configuration at the asymmetric carbon atom which carries \_\_\_\_\_ group.
- (C) In aseptic area the personnel are provided with uniforms made by .....8..... or by .....9.....
- (D) .....10..... is used as an .....11..... indicator in .....12..... titrations, because the fluorescence changes with .....13.....
- (E) Polypropylene glycol is usually included in topical formulations as a .....14..... and/or as a .....15.....
- (F) Transfer of most drugs across biologic membranes occurs by.....16..... diffusion region of .....17.....concentration to one of .....18..... concentration.
- (G) Biologic half-life of a drug that is eliminated by the first-order kinetics is mathematically represented by .....19..... <http://www.xamstudy.com>
- (H) In Quillaia bark, the dark patches often found on the outer surface are known as .....20.....

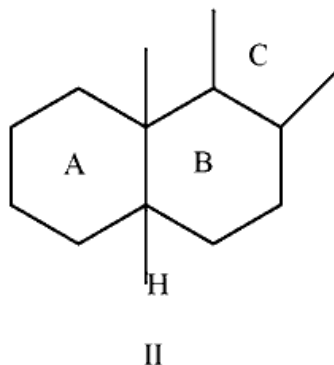
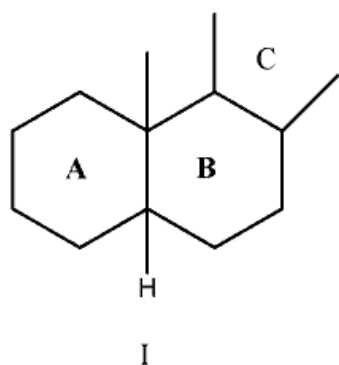
#### PART - B

4. (A) Complete the following reactions - Name the products 1 and 2 give the Hydrolysis structure of reactants and products.
- $$\text{Benzylcyanide} + \text{Di}[2 \text{ Chloroethylmethylamine}] \rightarrow 1 \xrightarrow[\text{esterify with ethyl alcohol}]{\text{Hydrolysis}} 2$$
- Complete with balanced equation
- (B) What happens when? Complete with balanced equation
- Tropine is treated with Mandelic acid
  - Estrone is treated with Potassium acetylide in liquid ammonia.
5. What inferences you draw from the following observations.
- A sample of cloves floats when they are placed in freshly boiled and cooled water.
  - A sample of cinnamon leaf oil gives intensive blue colour when an alcoholic solution is treated with ferric chloride, whereas the cinnamon bark gives a mild colour.
  - A sample of ginger is boiled with 2% KOH, when the pungency of the sample is lost.

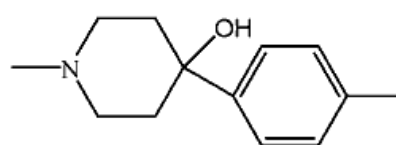
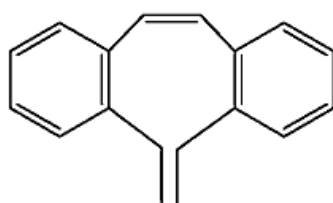
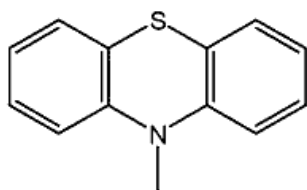
6. (A) Define in not more than 3 sentences
- (i) Multiple emulsion
  - (ii) Levigation
- (B) Important factors that affect absorption of a drug are
- (1) .....
  - (2) .....
  - (3) .....
  - (4) .....
  - (5) .....
  - (6) .....
7. (A) Tablets are evaluated by the following techniques. They are
- (1) .....
  - (2) .....
  - (3) .....
  - (4) .....
  - (5) .....
  - (6) .....
- (B) What are the functions of -
- (i) Protective/sorbents
  - (ii) Antidusting agents in the manufacture of capsules.
8. Give reasons for the following:
- (i) Mercuric acetate is added in the assay of ephedrine hydrochloride.
  - (ii) Acetic anhydride is added in the preparation of acetic perchloric acid and kept overnight.
  - (iii) Secondary filter is kept at right angles to the incident light in fluorimeter.
9. Give one test each to detect the presence of Karaya gum and Sterculia gum in Tragacanth I.P.
10. Given below are the systematic names of certain natural substances. Give their conventional names, sources and structural formulae.
- (i) Methyl-11, 17  $\alpha$ -dimethoxy, 18  $\beta$ -(3,4,5-trimethoxybenzoyloxy) 3  $\beta$ , 20  $\alpha$ -yohimbane, 16  $\beta$ -carboxylate
  - (ii) 1, 3-Dimethyl 2, 6-(1H, 3H)-purinedione
  - (iii) 4-Hydroxy-3-methoxybenzaldehyde
  - (iv) (1R,3r, 5S)-3-tropyloxytropanium sulphate
11. A compound of molecular formula  $C_6H_9NO$  exhibits spectral characteristics as follows
- I.R. (KBr) : 3200 , 1650, 2150, 1500, 1550,  $cm^{-1}$
- $UV_{max} = 280 \text{ nm.}$
- NMR ( $CDCl_3$ ) =  $\delta_{ppm}$  2.8 (s, 3H)
- =  $\delta_{ppm}$  5.8 (b, 1H)
- 6.8 – 7.6 (m, 5H)
- Mass =  $m^+/e$ , 135 (parent ion)
- What is the structural formula of the compound.



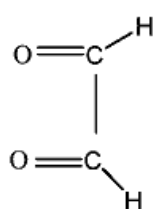
12. (A) Molecular weights of Cimetidine, Ranitidine and Famotidine are 252, 314 and 273. Oral bioavailabilities and elimination half-life in man are almost similar. Which of these drugs could be more acceptable and why?
- (B) What is the most essential structural feature, an antihistaminic should have?
- (C) Following representations in case of steroids are often used for denoting their stereochemistry. What does it indicate?



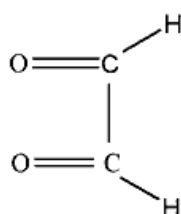
13. (A) Following ring structures are present in well known drugs. Complete the structural formulae by introducing the required groups



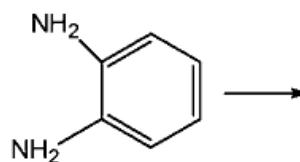
- (B) Complete the following synthesis



(i)



(ii)



14. (A) In aerosol technology, what is the significance for the following?
- Determination of the particle size
  - Discharge rate of aerosol valve
- (B) How much water is to be added to convert 50 ml of 1 in 2000 solution of atropine sulphate into 1 in 5000 solution?
15. In tablet manufacturing technology some of the problems faced are
- Soft tablets
  - Removal of air
  - Protected disintegration.
- How do the three problems occur? Mention how can they be corrected?

16. (A) Tetracycline undergoes ionization and exhibits three pka values at 3.3, 7.7 and 9.5. Write the structure and indicate the groups undergoing ionization?  
 (B) Omeprazole is an inhibitor of gastric acid secretion. Explain the mechanism of inhibition.
17. What are the two important tests carried out in the evaluation of chemical resistance of glass containers? Explain.
18. Briefly explain the mechanisms of action of the following drugs  
 (i) Nifedipine (ii) Atenolol  
 (iii) Diclofenac-Na
19. (A) How many 250 mg capsules of Ampicillin are required to provide 30mg/kg/day for a week for a man weighing 165 pounds.  
 (B) Natural group of purgative drugs showed the presence of anthraquinones and its reduced derivatives and compounds formed by the union of two anthrone molecules. They are  
 1 \_\_\_\_\_ 2 \_\_\_\_\_ 3 \_\_\_\_\_ 4 \_\_\_\_\_ Give their structural formulae.
20. (A) 1.59 gm of pure  $\text{Na}_2\text{CO}_3$  is neutralized by 50 ml of HCl solution. Find out the normality of the acid solution. [Na = 23, C = 12, O = 16] <http://www.xamstudy.com>  
 (B) As per the Pharmacopoea, the terms used in the description of powders are  
 1 \_\_\_\_\_ 2 \_\_\_\_\_ 3 \_\_\_\_\_ 4 \_\_\_\_\_ 5 \_\_\_\_\_
21. (A) Important methods of sterilization as per I.P are  
 1 \_\_\_\_\_ 2 \_\_\_\_\_ 3 \_\_\_\_\_ 4 \_\_\_\_\_ 5 \_\_\_\_\_ 6 \_\_\_\_\_.  
 (B) How many ml of an oil (specific gravity 0.975) is required to prepare 78 gms of spirit which is 15% w/w solution of the oil?

**End of paper**

**ANSWER KEY GATE 1993**

**Section -I**

1.1	a	1.2	c	1.3	b	1.4	b
1.5	d	1.6	b	1.7	d	1.8	c
1.9	d	1.10	a	1.11	a	1.12	a
1.13	c	1.14	a	1.15	a	1.16	d
1.17	a	1.18	a	1.19	a	1.20	a

**Section -II**

2.1	a	2.2	c	2.3	c	2.4	b
2.5	c	2.6	a	2.7	d	2.8	b
2.9	a	2.10	b	2.11	d	2.12	d
2.13	c	2.14	b	2.15	c		

# GPAT QUESTION PAPER 1992 WITH ANSWER KEY

## PY-PHARMACEUTICAL SCIENCES

Time : 3 hours

Maximum Marks : 200

- N. B.
- (1) This question paper contains two parts, A and B.
  - (2) Answer all questions from Part A.
  - (3) Answer any 20 questions from Part B.
  - (4) There will be no negative marking.

### PART - A

- N.B.
- (1) There are 2 Section in this part.
  - (2) Answer all question in both Section 1 and 2.
  - (3) Answer should be given in serial order in the answer book.
  - (4) Do not skip questions while writing the answers.
  - (5) Write the question number and show your answer by writing the alphabet (Against the No.) in capital letters.
  - (6) In section 1 each question carries 1 mark
  - (7) In section 2 each question carries 2 marks.
  - (8) A model is shown at the beginning of each section in part A.
  - (9) Answer to the question in this must be written in the first 3 (three) pages of the answer books only.

### SECTION - A

## CHOOSE THE CORRECT ANSWER

### Multiple choice Questions

- 1.1 Simethicone is a component of several antacid formulations. Chemically it is
- (a) Wax                                      (b) Fat                                      (c) Aldehyde                                      (d) Silicon
- 1.2 The pharmacy Council of India is constituted by the
- (a) Central Government                                      (b) State Government
- (c) Parliament                                      (d) Legislative Assembly
- 1.3 All of the following physicochemical constants are useful in predicting the solubility of a drug except
- (a) Dielectric constants                                      (b) pH of a solution
- (c)  $pK_a$  of the drug                                      (d) Valency

1.4 Sigma blade mixers are commonly used in

- (a) Wet granulation (b) Dry granulation  
(c) Powder mixing (d) Crude fibre mixing

1.5 The  $5\beta$  pregnane is said to have a

- (a) Trans-anti-trans-anti-trans backbone (b) Cis-anti-trans-anti-trans backbone  
(c) Cis-syn-trans-syn-trans backbone (d) Trans-anti-cis-anti-cis backbone

1.6 Many drugs are chiral. In a synthesis of chiral drug molecules in symmetric environment

- (a) Always one enantiomer is obtained  
(b) Always both enantiomers is obtained in equal amounts  
(c) Always both enantiomers is obtained in unequal amounts  
(d) None of the above

1.7 Poorly manufactured tablets may have small pinholes on the surface. This phenomenon is known as

- (a) Picking (b) Mottling (c) Leaching (d) Cracking

1.8 Ascorbic acid exists in nature

- (a) Only in the reduced form which has only biological activity  
(b) Only in the oxidized form which has only biological activity  
(c) In both reduced and the oxidized forms in the state of reversible equilibrium which has biological activity  
(d) None of the above

1.9 In the stable conformation of  $5\alpha$ -pregnane

- (a) Rings A, B, C are in boat conformation  
(b) Rings A and B are in boat while C in chair conformation  
(c) Ring A is in boat while B and C in chair conformation  
(d) All the three rings are in chair conformation

1.10 Among the following preparations, which one will be the most irritating to the eye?

- (a) Purified water (b) 0.7% NaCl solution  
(c) 0.9% NaCl solution (d) 1% NaCl solution

1.11 In case of hypothyroidism, the preferred thyroid preparation is

- (a) Levothyroxine (b) Dextrothyroxine  
(c) Leothyroxine (d) None of the above

1.12 D-Fructose on simple reduction gives

- (a) L-Fructose (b) Only Sorbitol  
(c) Mannitol (d) Mixture of Mannitol and Sorbitol

1.13 Lugol's solution contains 5% of iodine. How much of Lugol's solution is administered to a patient thrice daily to provide 60 mg of iodine daily?

- (a) 0.2 ml (b) 0.3 ml (c) 0.4 ml (d) 0.5 ml

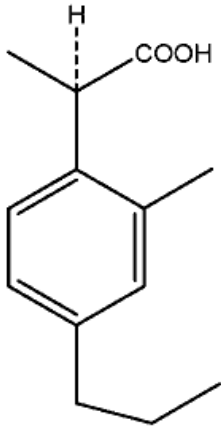
1.14 The anticoagulant Heparin is obtained from

- (a) Sheep's lung (b) Dog's kidney (c) Rabbit's heart (d) Rat's uterus

1.15 Which one of the following types of adverse drug reactions are not believed to be dose-related phenomenon?

- (a) Side effects and toxic reactions
- (b) Toxic reactions and hypersensitivity
- (c) Side effects and hypersensitivity
- (d) Hypersensitivity and idiosyncrasy

1.16 The structure of a drug having an asymmetric center is shown. Using the IUPAC system, the configuration will be



- (a) R
- (b) S
- (c)  $\alpha$
- (d)  $\beta$

1.17 Cryoscopic method is familiar in the calculations of isotonic solutions. This method is based on

- (a) Freezing point depression of the drug
- (b) Molecular concentration of the drug
- (c) pH of the drug
- (d) None of the above

1.18 One thousand nanogram equal to one

- (a) Centigram
- (b) Gram
- (c) Kilogram
- (d) Microgram

1.19. Biological role of thiamine is because of facile formation of

- (a) Thiamine hydrochloride
- (b) Thiamine pyrophosphate
- (c) Thiamine sulphate
- (d) None of the above

1.20. Infected blood products may produce serum hepatitis due to the presence of

- (a) Hepatitis A virus
- (b) Hepatitis B virus
- (c) Hepatitis C virus
- (d) None of the above

1.21. pH of a buffer system can be calculated by using

- (a) pH partition theory
- (b) Noyes-Whitney law
- (c) Henderson-Hasselbalch equation
- (d) None of the above

1.22. Osmolality measures the total number of particles dissolved in a ..... of water and depends on the electrolytic nature of the solute.

- (a) Kilogram
- (b) Kilolitre
- (c) Litre
- (d) Specified quantity

1.23. Ergot is the sclerotium of

- (a) Fungus *Claviceps purpurea*
- (b) Fungus *Claviceps notatum*
- (c) *Strychnos Mixpotatorm*
- (d) Fungus *Pencillium chrysogenum*

1.24. A highly sensitive semiquantitative method of detecting microbial antigen in biological fluid is done by

- (a) Radioimmuno electrophoresis
- (b) Counter immunoelectrophoresis
- (c) H.P.L.C
- (d) Freeze dried centrifugal method

1.25 The glass electrode used in pH measurements is

- (a) Metal-metaloxide electrode
- (b) A membrane electrode
- (c) Ion selective electrode
- (d) None of the above

1.26 In phenothiazine tranquillizing agents, replacement of C-2 hydrogen by chlorine

- (a) Decreases activity
- (b) Increases activity
- (c) Activity unaffected
- (d) Leads to decreased penetration into the CNS

1.27 The loading dose of a drug is based upon the

- (a) Time taken for complete elimination
- (b) Percentage of drug excreted unchanged in urine
- (c) Percentage of drug bound to plasma protein
- (d) Apparent volume of distribution and the desired drug concentration in plasma

1.28 Conformation of drugs is commonly determined by

- (a) NMR
- (b) NMI
- (c) Mass spectrometry
- (d) pH determination

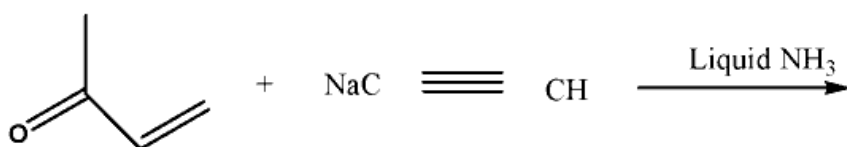
1.29 Aminophylline solutions on exposure to air may develop

- (a) Crystals of theophylline
- (b) Precipitate of aminophylline
- (c) Precipitate of ethylenediamine
- (d) Straw colour

1.30 The hypotensive effect of clonidine is due to its action on

- (a) Beta -adrenergic receptor
- (b) Alpha-adrenergic receptor
- (c) H<sub>2</sub> -receptor
- (d) H<sub>2</sub> receptor

1.31 A step in Vitamin A synthesis is The product obtained will be



The product obtained will be

- (a) 3-hydroxy-3-methyl-1-pentene-4-yne
- (b) hex-1-yn-5-one
- (c) 3-amino-3-methyl-1-pentene-4-yne
- (d) None of the above

1.32 Sodium nitroprusside is one of the most potent blood-pressure lowering drugs. Its use is limited because of

- (a) Its short duration of action
- (b) Very long duration of action
- (c) Ineffective of oral route
- (d) None of the above

1.33 Cocaine is a monoacid tertiary base which on treatment with hot dilute acids gives

- (a) Ecgonine, methyl alcohol and scopinic acid
- (b) Ecgonine, methyl alcohol and cinnamic acid
- (c) Ecgonine, methyl alcohol and benzoic acid
- (d) Ecgonine, ethyl alcohol and benzoic acid



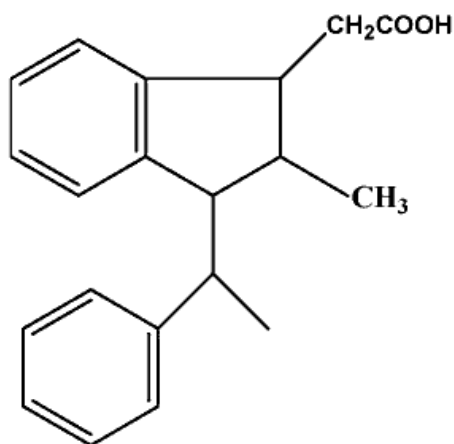
1.34 Use of Isoniazid is restricted due to

- (a) Ototoxicity
- (b) Hepatotoxicity
- (c) Neurotoxicity
- (d) Bone marrow depression

1.35 Diosgenin is

- (a) An alkaloid obtained from dioscorea
- (b) A carbohydrate obtained from dioscorea
- (c) A glycoside obtained from dioscorea
- (d) None of the above

1.36 The IUPAC nomenclature of the sulindac analogue



- (a) (Z)-5-Fluoro-2-methyl-1-phenylmethylene-1H-indene-3-acetic acid
- (b) (E)-5-Fluoro-2-methyl-1-phenylmethylene-1H-indene-3-acetic acid
- (c) 5-Fluoro-2-methyl-1-phenylmethylene-1H-indene-3-acetic acid
- (d) (R)-5-Fluoro-2-methyl-1-phenylmethylene-1H-indene-3-acetic acid

1.37 Bubble point test is done to determine

- (a) The surface tension of the liquid in capillary tubes
- (b) The viscosity of the liquid in ampoules <http://www.xamstudy.com>
- (c) The pH of a 1% solution
- (d) The volume of the solution stored in a specified container

1.38 The "Hemiacetal" form of aldosterone is between

- (a) C-11,  $\beta$ -hydroxyl and C-20 carbonyl
- (b) C-11,  $\beta$ -hydroxyl and C-21 hydroxy
- (c) C-11,  $\beta$ -hydroxy and C-18 carbonyl
- (d) C-21, hydroxyl and C-20 carbonyl

1.39 Surfactants are characterized by the presence of

- (a) Water solubilizing and fat solubilizing groups in the same molecule
- (b) Only negative charges
- (c) Only positive charges
- (d) None of the above

1.40 Acetous perchloric acid solution a common titrant in non-aqueous titrimetry is standardized by

- (a) Standard alcoholic KOH solution
- (b) N/10 Potassium permanganate
- (c) Potassium hydrogen phthalate solution in glacial acetic acid
- (d) Mercuric acetate in glacial acetic acid

**SECTION - B**

**MATCH THE FOLLOWING**

2.1 The antibiotics mentioned below are obtained from the organisms listed from A to E. match them.

- |                        |                                     |
|------------------------|-------------------------------------|
| (1) Neomycin           | (A) <i>Streptomyces fradiae</i>     |
| (2) Gentamycin         | (B) <i>Micromonospora purpurea</i>  |
| (3) Bacitracin         | (C) <i>Streptomyces tenebrarius</i> |
| (4) Tobramycin         | (D) <i>Bacillus subtilis</i>        |
|                        | (E) <i>Bacillus polymyxa</i>        |
| (a) 1-A, 2-C, 3-B, 4-D | (b) 1-B, 2-D, 3-C, 4-A              |
| (c) 1-A, 2-B, 3-D, 4-C | (d) 1-B, 2-E, 3-C, 4-A              |

2.2. Given below is a list of medicinal plants. Match them correctly with the list of constituents given in A to E.

- |                                      |                        |
|--------------------------------------|------------------------|
| (1) <i>Holarrhena ntidysenterica</i> | (A) Conessine          |
| (2) <i>Cymbopogan flexuous</i>       | (B) Citral             |
| (3) <i>Urginea indica</i>            | (C) Mucilage           |
| (4) <i>Linum usitatissimum</i>       | (D) Cocaine            |
|                                      | (E) Scillarenin        |
| (a) 1-A, 2-C, 3-B, 4-D               | (b) 1-A, 2-B, 3-E, 4-C |
| (c) 1-A, 2-B, 3-D, 4-C               | (d) 1-B, 2-E, 3-C, 4-A |

2.3. The following drugs are included under the schedules listed in A to E. match them.

- |                                     |                        |
|-------------------------------------|------------------------|
| (1) Meprobamate                     | (A) Schedule E         |
| (2) Poisonous drugs                 | (B) Schedule FF        |
| (3) Ophthalmic preparations         | (C) Schedule C and C   |
| (4) Biological and special products | (D) Schedule X         |
|                                     | (E) Schedule Q         |
| (a) 1-D, 2-A, 3-B, 4-C              | (b) 1-B, 2-D, 3-C, 4-A |
| (c) 1-A, 2-B, 3-D, 4-C              | (d) 1-B, 2-E, 3-C, 4-A |

2.4. Following drugs contain 2 hydroxyl groups each. Nature of these hydroxyl groups are indicated in A to E.

Match them correctly.

- |                        |                                    |
|------------------------|------------------------------------|
| (1) Morphine           | (A) Alcoholic but one 1 another 2  |
| (2) Chloramphenicol    | (B) Alcoholic and both 1           |
| (3) Apomorphine        | (C) Both phenolic                  |
| (4) Cortisone          | (D) One alcoholic and one phenolic |
|                        | (E) Alcoholic but 1 and another 3  |
| (a) 1-A, 2-C, 3-B, 4-D | (b) 1-D, 2-A, 3-C, 4-E             |
| (c) 1-A, 2-B, 3-D, 4-C | (d) 1-B, 2-E, 3-C, 4-A             |

2.5. The following drug molecules contain heterocyclic rings listed in A to E. match them correctly.

- |                        |                        |
|------------------------|------------------------|
| (1) Haloperidol        | (A) Pyrimidine         |
| (2) Sulphadiazine      | (B) Pyridine           |
| (3) Amiloride          | (C) Piperidine         |
| (4) Pheniramine        | (D) Pyrazine           |
|                        | (E) Pyridazine         |
| (a) 1-C, 2-A, 3-D, 4-B | (b) 1-B, 2-D, 3-C, 4-A |
| (c) 1-A, 2-B, 3-D, 4-C | (d) 1-B, 2-E, 3-C, 4-A |

2.6. Following drugs exhibit their action by enzyme inhibition. Enzymes are listed in A to E. Match them correctly.

- |                        |                         |
|------------------------|-------------------------|
| (1) Captopril          | (A) $\beta$ - lactamase |
| (2) Clavulanic acid    | (B) MAO                 |
| (3) Pargyline          | (C) Monooxygenase       |
| (4) Methazolamide      | (D) Carbonic anhydrase  |
|                        | (E) ACE                 |
| (a) 1-C, 2-A, 3-D, 4-B | (b) 1-E, 2-A, 3-B, 4-D  |
| (c) 1-A, 2-B, 3-D, 4-C | (d) 1-B, 2-E, 3-C, 4-A  |

2.7. Following preparations are assayed by biological techniques using the animal or its parts listed in A to E. match them correctly.

- |                        |                           |
|------------------------|---------------------------|
| (1) Cod liver oil      | (A) Sheep blood           |
| (2) Heparin injection  | (B) Rabbit                |
| (3) Oxytocin injection | (C) Rat                   |
| (4) Insulin injection  | (D) Anaesthetized chicken |
|                        | (E) Cat                   |
| (a) 1-D, 2-A, 3-C, 4-B | (b) 1-B, 2-D, 3-C, 4-A    |
| (c) 1-A, 2-B, 3-D, 4-C | (d) 1-B, 2-E, 3-C, 4-A    |

2.8. Following I.P. assays involve the principles listed in A to E. Match them.

- |                               |   |
|-------------------------------|---|
| (1) Sodium chloride injection | (A) Titration with N/10 iodine                          |
| (2) Trimethoprim              | (B) Oxidation involving 2 : 6 dichlorophenol indophenol |
| (3) Analgin tablets           | (C) Argentometry  |
| (4) Ascorbic acid             | (D) Non-aqueous   |
|                               | (E) Acidimetry  |

- (a) 1-C, 2-A, 3-D (b) 1-B, 2-D, 3-C  
 (c) 1-A, 2-B, 3-D (d) 1-B, 2-E, 3-C

2.9. Given below are some antihypertensive mechanisms. Drugs which are closely associated with these mechanisms of action are listed in A to E. Match them correctly?

- (1) Ganglion blocking (A) Methyl dopa  
 (2) Catecholamine depletor (B) Hydralazine  
 (3) False neurotransmitter (C) Reserpine  
 (4) Direct action on arterioles (D) Mecamylamine  
 (E) Veratrum alkaloids

- (a) 1-C, 2-A, 3-D, 4-B (b) 1-B, 2-D, 3-C, 4-A  
 (c) 1-A, 2-B, 3-D, 4-C (d) 1-D, 2-C, 3-A, 4-B

2.10. Listed are Vitamins. Their associations with certain coenzymes are well known. The names of coenzymes are given in A to E. match them correctly.

- (1) Thiamine (A) Co-carboxylase  
 (2) Riboflavin (B) Co-enzyme A  
 (3) Pantothenic acid (C) NAD  
 (4) Nicotinamide (D) FAD  
 (E) ATP

- (a) 1-A, 2-D, 3-B, 4-C (b) 1-B, 2-D, 3-C, 4-A  
 (c) 1-A, 2-B, 3-D, 4-C (d) 1-B, 2-E, 3-C, 4-A

2.11. Listed are some of the crude drugs which are tested for the active constituents by the tests mentioned in A to E. Match them correctly.

- (1) Cinchona Bark (A) Fluorescence test  
 (2) Nux vomica seeds (B) Keller Killiani  
 (3) Digitalis leaves (C) Borntrager's test  
 (4) Senna leaves (D) Mayer's test  
 (E) Sham's test

- (a) 1-A, 2-D, 3-B, 4-C (b) 1-B, 2-D, 3-C, 4-A  
 (c) 1-A, 2-B, 3-D, 4-C (d) 1-B, 2-E, 3-C, 4-A

2.12. Listed are some of the common volatile oils. Their active constituents are given in A to E. Match them correctly.

- (1) Peppermint oil (A) (+)-Limonene  
 (2) Turpentine oil (B) 1 : 8-Cineole  
 (3) Eucalyptus oil (C)  $\alpha$  Pinene  
 (4) Lemon oil (D) (-) Menthol  
 (E) (+) Methol

- (a) 1-C, 2-A, 3-D, 4-B (b) 1-D, 2-C, 3-B, 4-A  
 (c) 1-A, 2-B, 3-D, 4-C (d) 1-B, 2-E, 3-C, 4-A

2.13. Match the each pair with the type of a structural relationship they exhibit.

- |                                 |  |
|---------------------------------|--|
| (1) (R) and (S) Naproxen        | (A) Tautomers of one another   |
| (2) Dilactim and Monolactim     | (B) Diastereomers of one another form of Barbituric acid   |
| (3) Quinine and Quinidine       | (C) Non-superimposable mirror images of each other   |
| (4) Eclipsed and staggered form | (D) Superimposable mirror images of each other of phenothiazine about side chain carbon ocarbon bond |
- (a) 1-C, 2-A, 3-B, 4-E  
(b) 1-B, 2-D, 3-C, 4-A  
(c) 1-A, 2-B, 3-D, 4-C  
(d) 1-B, 2-E, 3-C, 4-A

2.14. Various polymers used in pharmacy are given. Match with the respective monomers A to E.

- |                   |                             |
|-------------------|-----------------------------|
| (1) Carbopol      | (A) Methacrylate ester      |
| (2) Eudragits     | (B) Ethylene                |
| (3) Polyethylene  | (C) Ethylene glycol         |
| (4) Polycarbonate | (D) (Bis-phenol + phosgene) |
- (a) 1-C, 2-A, 3-D, 4-B  
(b) 1-B, 2-D, 3-C, 4-A  
(c) 1-A, 2-B, 3-D, 4-C  
(d) 1-E, 2-A, 3-B, 4-D

2.15. Following are some naturally occurring substances. They are classified under different categories which are listed in A to E. match them correctly.

- |                    |                 |
|--------------------|-----------------|
| (1) Prostaglandins | (A) Opioids     |
| (2) Codeine        | (B) Eicosinoids |
| (3) Angiotensin II | (C) Corticoids  |
| (4) Strophanthidin | (D) Peptide     |
- (a) 1-C, 2-A, 3-D, 4-B  
(b) 1-B, 2-A, 3-D, 4-E  
(c) 1-A, 2-B, 3-D, 4-C  
(d) 1-B, 2-E, 3-C, 4-A

2.16. Following are some of the analytical instruments. Their important components are listed in A to E. Match them correctly.

- |                                      |                                |
|--------------------------------------|--------------------------------|
| (1) HPLC                             | (A) Monochromator              |
| (2) IR double beam spectrophotometer | (B) Dropping mercury electrode |
| (3) Karl-Fischer titrator            | (C) Isocratic pump             |
| (4) Polarograph                      | (D) Platinum electrode         |
- (a) 1-C, 2-A, 3-D, 4-B  
(b) 1-B, 2-D, 3-C, 4-A  
(c) 1-C, 2-A, 3-D, 4-B  
(d) 1-B, 2-E, 3-C, 4-A

2.17. The hard gelatin capsule sizes are mentioned in their number. Their approximate capacity are listed in A to E. Match their correct volume.

- |       |             |
|-------|-------------|
| (1) 0 | (A) 0.10 ml |
| (2) 1 | (B) 0.15 ml |
| (3) 3 | (C) 0.30 ml |

- (4) 5 (D) 0.55 ml  
 (E) 0.75 ml  
 (a) 1-C, 2-A, 3-D, 4-B (b) 1-B, 2-D, 3-C, 4-A  
 (c) 1-A, 2-B, 3-D, 4-C (d) 1-E, 2-D, 3-C, 4-B

2.18. Listed are some of the commonly used drugs. Their pharmacological actions are listed in A to E. match them.

- (1) Aspirin (A) Rises body temperature  
 (2) Acetaminophen (B) Non-analgesic anti-inflammatory  
 (3) Phenylbutazone (C) Non-anti-inflammatory analgesic  
 (4) Probenacid (D) Increases depth of respiration  
 (E) Increases fluid retention  
 (a) 1-C, 2-A, 3-D, 4-B (b) 1-B, 2-D, 3-C, 4-A  
 (c) 1-A, 2-B, 3-D, 4-C (d) 1-D, 2-C, 3-B, 4-E

2.19. Match the preservations/antioxidants listed in A to E for the preparations mentioned below.

- (1) Anaesthetic ether (A) Chloroform  
 (2) Formaldehyde (B) Ethylenediamine  
 (3) Injection of Adrenaline (C) Paraformaldehyde  
 (4) Injection of Aminophylline (D) Sodium bisulphate  
 (E) Alcohol  
 (a) 1-C, 2-A, 3-D, 4-B (b) 1-B, 2-D, 3-C, 4-A  
 (c) 1-E, 2-C, 3-D, 4-B (d) 1-B, 2-E, 3-C, 4-A

2.20. In communiton, certain type of materials listed in A to E are not suitable for the mills mentioned below. Match them.

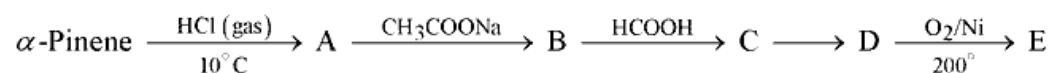
- (1) Cutter mill (A) Soft material  
 (2) Hammer mill (B) Adhesive material  
 (3) Revolving mill (C) Friable material  
 (4) Fluid energy mill (D) Liquifiable material  
 (E) Abrasive material  
 (a) 1-C, 2-A, 3-D, 4-B (b) 1-B, 2-D, 3-C, 4-A  
 (c) 1-E, 2-C, 3-D, 4-B (d) 1-B, 2-E, 3-C, 4-A

## PART - B

3. Define:

- (A) Co-solvency (B) Hydrotrophy (C) Eutectic mixtures

4. Complete the following reactions giving the structures





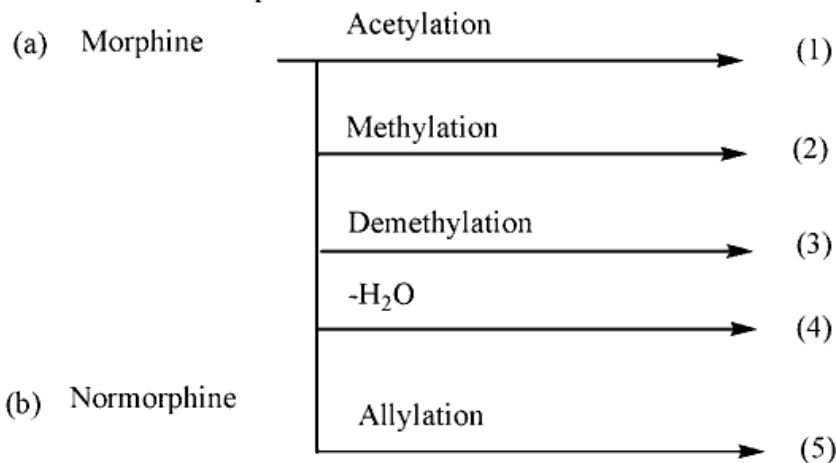
5. (A) Thiamin when treated with sodium sulphite solution saturated with  $\text{SO}_2$  at room temperature, decomposes quantitatively into 2 components. What are they? Give their structural formulae.
- (B) Riboflavin on exposure to light in sodium hydroxide solution forms an insoluble product. What is the product? Write equation. Why is it insoluble?
- (C) Caffeine  $\xrightarrow{\text{Cl}_2}$  A  $\xrightarrow[\text{NaOH}]{\text{CH}_3\text{OH}}$  B  $\xrightarrow[\text{Boil}]{\text{DiHCl}}$  C +  $\text{CH}_3\text{Cl}$   $\xrightarrow[\text{NaOH}]{\text{CH}_3\text{I}}$  D
6. (A) Name two common equipments used for testing the hardness of a tablet  
 (i) ..... (ii) .....
- (B) Give four factors which affect the hardness of a tablet.
- (C) Why friability test is performed? How is it performed?
7. Give four important tests to detect the emulsion types.
8. (A) List the names of three important semisynthetic hydrocolloids used in pharmacy.  
 (B) What is their chemical nature?  
 (C) Give three important uses of the above hydrocolloids.
9. (A) Diethyl malonate is treated with excess of n-propylbromide in presence of sodium ethoxide to give intermediate (A). The intermediate (A) on refluxing in dilute alkali gives anticonvulsant drug. Write the reactions and structures.
- (B) 2-Aminopyridine is reductively alkylated using 1 mol of p-methoxybenzaldehyde and reducing agent to give an intermediate (B), the intermediate (B) on treatment with 1 mol dimethylaminoethylbromide in presence of sodium amide gives an antihistaminic drug. Write the reactions and structures.
- (C) Arrange the nitrogens in the drug referred in  
 (d) Above in decreasing order of basicity.
10. (A) Give the graph [include correct scale and values] of cardiac action potential as recorded from a Purkinje fibre. Indicate the phases of depolarization and repolarisation (graph paper not to be used).
- (B) Expand the abbreviations and indicate how they are formed. <http://www.xamstudy.com>  
 (i) cAMP  
 (ii) GABA
11. Write the appropriate reagent(s) and the structures in the following transformations. Give the trivial name of the drug and the category it belongs.
- (i) p-Methoxyphenylhydrazine  $\xrightarrow[\text{heat, solvent}]{\text{ZnCl}_2}$  A +  $\text{NH}_3$  +  $\text{H}_2\text{O}$   
 +  
 Ethyl 4-oxopentanoate
- (ii) A + p-chlorobenzoylchloride  $\xrightarrow[\text{Pyridine}]{\text{Base}}$  B
- (iii) B  $\longrightarrow$  [Drug]  
 (contains -COOH)

Note: One step involves Fischer indolisation.

12. (A) Give synthesis of pyridoxine starting from 5-ethoxy-4-methyl isoxazole and cis butenediol protected with isobutaraldehyde.

(B) Name the key reaction

13. Give the names of products.



(c) Give the structural formula for Nalorphine

14. (A) What is Vitali's test? Which natural products are distinguished by this test?

(B) Give reasons for the following:

(i) Morphine is soluble in aqueous sodium hydroxide.

(ii) In the assay of alkaloids, the final residue is treated with little alcohol before it is finally dissolved in acid and titrated.

15. (A) Alkaloids of ergot exist in stereoisomeric pairs. Which are they? Whine one is pharmacologically active?

(B) The principal alkaloids of ipecacunha are:

(1) ..... (2) ..... (3) ..... (4) .....

(5).....

(B) Cephaeline  $\xrightarrow{\text{Methylene}}$

(6) .....

(D) *Catharanthus roseus* contains 2 alkaloids which are effective in the treatment of neoplastic Diseases, they are

(7) ..... (8) .....

16. (A) Give the procedure for IP assay for Nikethamide injection.

(B) Give the reactions involved in the above assay.

(C) To which category of drugs this compound belongs?

17. (A) Show the 5 $\beta$  -cis fusion and 5 $\alpha$  -trans fusion in case of steroid nucleus. What they are usually called?

(B) Name the different types of insulin preparations.

(C) Usual route of administration of insulin preparation is \_\_\_\_\_

(D) Since insulin is a \_\_\_\_\_ it cannot be given orally.

18. (A) Which are the substances defined as Narcotic drugs and Psychotropic substances under Narcotic drugs and Psychotropic Substances Act, 1985 and rules?  
 (B) What is the international name for small-pox vaccine?  
 (C) How much of sodium chloride is required to render 150 ml of a 2% solution of procaine hydrochloride isotonic with blood serum? [Freezing point depression of 1% procaine hydrochloride is  $-0.12^{\circ}\text{C}$  and 1% sodium chloride is  $-0.56^{\circ}\text{C}$ ].
19. What are the particulars to be recorded in analytical records for parenteral preparations as per the G.M.P. requirement under and C rules? List them correctly.
20. (a) An antibiotic isolated from *Streptomyces venezuelae* having an aromatic nitro group, on hydrolysis gives  
 (A) Dichloroacetic acid  
 (B) 2-amino-1-p-nitrophenyl-1 : 3-propanediol  
 (1) What is the structural formula of the antibiotic?  
 (2) How many asymmetric carbon atoms are present in B?  
 (3) What is the optical activity and configuration of the active form of the antibiotic?  
 (b) What are the important hydrolytic products of streptomycin? Give their names only.
21. (A) Explain what is  $E_{1\text{cm}}^{1\%}$   
 (B) What is Group frequency region and finger print region?  
 (C) What is retention volume?
22. (A) What processes are to be adopted in pharmaceutical industry for the  
 (i) separation of bacteria from the parenteral liquids  
 (ii) purification of colloids and enzymes  
 (iii) removal of particulate matter in the air?  
 (B) How much of 90% and 20% alcohols are required to produce 350 ml of 60% alcohol?
23. (A) Classify the surfactants with suitable example for each:  
 (B) LAL test is used as in-process control in parenteral preparations:  
 (i) What for is it used? (ii) How is the test performed?
24. How will you rectify the following defects in tablet manufacturing?  
 (i) Punch variation (ii) Hardness variation  
 (iii) Double impression (iv) Poor flow
25. (A) Name four foam systems used in aerosol technology.  
 (B) Name four parameters in the evaluation of foam stability.  
 (C) Explain the following words used in communiton in one sentence for each  
 (i) Open circuit milling  
 (ii) Closed circuit milling

26. (A) In the evaluation of soft capsules, the following terms are used. Explain them in one sentence for each.  
 (i) Soft spot                      (ii) Bloating                      (iii) Foreign capsule
- (B) A drug is used for synthesis purpose in the concentration of 8 mg/kg and it is available as 2 ml ampoules of 150 mg strength. how much of the drug is required for an adult male aged 32 years having a weight 45 kg with the body surface of 1.9 m<sup>2</sup> ?
27. (A) Synthesis of a steroid hormone is given below. Write all the structures. Give the reagents used in Oppenaur oxidation:
- (i) 3  $\beta$ -Acetoxypregna-5, 16-diene-20one  $\xrightarrow{H_2(Pd)}$  A
- (ii) (A)  $\xrightarrow[H_2O+C_2H_5OH]{NaOH}$  B  $\xrightarrow[Oxidation]{Oppenaur}$  [Hormone]
- (B) The above hormone shows two absorption bands in carbonyl region in its infrared spectrum. Write the approximate position of the band in wave numbers and indicate the corresponding chromophore.

**End of paper**

**ANSWER KEY GATE 1992**

**Section - A**

1.1	d	1.11	b	1.21	c	1.31	a
1.2	a	1.12	d	1.22	a	1.32	a
1.3	d	1.13	c	1.23	a	1.33	c
1.4	c	1.14	a	1.24	b	1.34	c
1.5	b	1.15	d	1.25	c	1.35	c
1.6	b	1.16	a	1.26	b	1.36	b
1.7	a	1.17	a	1.27	d	1.37	a
1.8	c	1.18	d	1.28	a	1.38	c
1.9	d	1.19	b	1.29	a	1.39	a
1.10	d	1.20	b	1.30	b	1.40	a

**Section - B**

2.1	c	2.6	b	2.11	a	2.16	c
2.2	b	2.7	d	2.12	b	2.17	d
2.3	a	2.8	a	2.13	a	2.18	d
2.4	b	2.9	d	2.14	d	2.19	c
2.5	a	2.10	a	2.15	b	2.20	c

# GPAT QUESTION PAPER 1991 WITH ANSWER KEY

## PY-PHARMACEUTICAL SCIENCES

Time : 3 hours

Maximum Marks : 200

### PART - A

(80 marks)

- N. B.**
- (1) There are 2 Section in this part
  - (2) Answer all question in both Section 1 and 2.
  - (3) Answer should be given in serial order in the answer book.
  - (4) Do not skip questions while writing the answers.
  - (5) Write the question number and show your answer by writing the alphabet (Against the No.) in capital letters.
  - (6) In section 1 each question carries 1 mark
  - (7) In section 2 each question carries 2 marks.
  - (8) A model is shown at the beginning of each section in part A.
  - (9) Answer to the question in this must be written in the first 3 (three) pages of the answer books only.

### SECTION - I

## CHOOSE THE CORRECT ANSWER

### Multiple choice Questions

#### 1.1 Cortisone is

- 4 - Pregnane-12  $\alpha$ , 21 diol- 3, 20- dione
- 4 - Pregnene-17  $\alpha$ , 21 diol- 3, 11, 20- trione
- 4 - Pregnene-16  $\alpha$ , 21 diol- 3, 11, 20- trione
- 4 - Pregnane-17  $\alpha$ , 21 diol- 3, 11, - dione

#### 1.2 Pregnenolone, an intermediate in synthesis of steroids, on oppeneur oxidation gives

- |                   |                                    |
|-------------------|------------------------------------|
| (a) Progesterone  | (b) 9 $\alpha$ - Flurocortisone    |
| (c) Triamcinolone | (d) $\alpha$ - Methyl Prednisolone |

#### 1.3 In congestive cardiac failure, digitalis glycosides are used because it increases

- |                         |   |
|-------------------------|---|
| (a) The heart rate      | (b) The force of myocardial contraction |
| (c) The venous pressure | (d) The cardiac filling pressure        |

#### 1.4 Shrinkage of gel by extrusion of lipids is called

- |               |               |                |                |
|---------------|---------------|----------------|----------------|
| (a) Syneresis | (b) Dilatancy | (c) Plasticity | (d) Ebullition |
|---------------|---------------|----------------|----------------|

- 1.5 The sweetening agent commonly used in chewable tablet formula is
- (a) Sucrose (b) Cyclamate Sodium  
(c) Saccharin Sodium (d) Mannitol
- 1.6 Carbamazepine is tricyclic antidepressant, It is classified as
- (a) Benzodiazepine (b) Arylalkanolamine  
(c) Iminostilbene (d) Benzimidazole
- 1.7 Sulfa drugs can be conveniently estimated using the reagent
- (a) 4,4-Dithiobis - (2-nitrobenzoic acid)  
(b) Tris-(hydroxyl methyl) amino methane sodium nitrate  
(c) N-(1-naphthyl) ethylene diamine  
(d) N-ethylmaleimide
- 1.8 Testosterone can be commercially synthesized from
- (a) Sarsapogenin (b) Mexogenin  
(c) Oubagenin (d) Halotensin
- 1.9 Ehrlich's reagent is
- (a) Bismuth iodide solution (b) p-dimethyl aniline solution in alcohol  
(c) p-dimethyl amino benzaldehyde solution (d) p-dimethyl aniline solution in alcohol
- 1.10 The neurotransmitter is released at the sympathetic nerve fiber is
- (a) Epinephrine (b) Nor-epinephrine  
(c) Acetylcholine (d) Physostigmine
- 1.11 The dose of the drug is 5 mg/kg body weight, How much the drug is required for the boy of 12 years who weigh 21 kg.
- (a) 0.5 mg (b) 1.0 mg (c) 1.5 mg (d) 2.0 mg
- 1.12 Rancidity of fat is due to
- (a) Oxidation (b) Saponification (c) Hydrolysis (d) Neutralization
- 1.13 Resolution of monochromator is the ability to distinguish
- (a) As a separate entities adjacent spectral features  
(b) Separation of different colours  
(c) Separation of UV light and Visible light  
(d) Dispersing characteristics
- 1.14 Important activity noticed in testosterone
- (a) Androgenic, Myotropic and Anabolic (b) Progestinal, Myotropic and Anabolic  
(c) Estrogenic, Myotropic and Anabolic (d) Androgenic, Optometric and Catabolic
- 1.15 Fruits which are derived from plants Umbeliferae are all of the type
- (a) Cremocarp (b) Pericarp  
(c) Epicarp (d) Mesocarp
- 1.16 Amygdalin on hydrolysis gives
- (a) Mandelonitrile + Benzaldehyde (b) Mandelonitrile + Benzaldehyde + Glucose  
(c) Mandelonitrile + Glucose (d) Mandelonitrile + Benzaldehyde + Rhamnose



1.17 Erythromycin is an antibiotic. It belongs to the class of

- (a) Beta-lactam
- (b) Aminoglycoside
- (c) Macrolide
- (d) Peptide

1.18 Vinblastin and Vincristine act by

- (a) Interfering with synthesis of transfer RNA
- (b) Inhibition of fragmentation of DNA
- (c) Binding to protein
- (d) Incorporating into folic acid metabolism

1.19 Water attack test is used to identify the alkalinity in

- (a) Type I glass
- (b) Type II glass
- (c) Type III glass
- (d) All the three types

1.20 Select the drug that will aggravates bronchial asthma

- (a) Amphetamine
- (b) Morphine
- (c) Propranolol
- (d) Tubocurarine

1.21 The presence of unpaired electron in metal ion complex meant for special analysis is called

- (a) Paramagnetic
- (b) Dimagnetic
- (c) Bimagnetic
- (d) Unimagnetic

1.22 The biological half-life of drug

- (a) It is a constant physical property of the drug
- (b) It is a constant chemical property of the drug
- (c) It may be increased in patients with impaired renal failure
- (d) It may be decreased in patients by giving the drug by rapid IV injection

1.23 The ilkovic equation in the polarographic measurements is given by

- (a)  $V = \pi r^4 (\Delta P / 8l) \cdot n$
- (b)  $i_d = 607ncD^{1/2}m^{2/3}t^{1/6}$
- (c)  $V = \frac{H^2 r^2}{2} \cdot \frac{e}{m}$
- (d)  $P_0 - P = P_0 (1 - e^{-abc})$

1.24 The vitamin which has deodorant property is

- (a) Vitamin A
- (b) Vitamin C
- (c) Vitamin D
- (d) Vitamin E

1.25 A type of flow in which viscosity increases when the substance agitated is

- (a) Plastic
- (b) Pseudoplastic
- (c) Dilatant
- (d) Thixotropy

1.26 Subcoating is given to the the tablets

- (a) To increase the bulk
- (b) To avoid deterioration due to microbial attack
- (c) To prevent the solubility of in acidic media
- (d) To avoid stickiness

1.27 Water resistance of glass container are tested by measuring

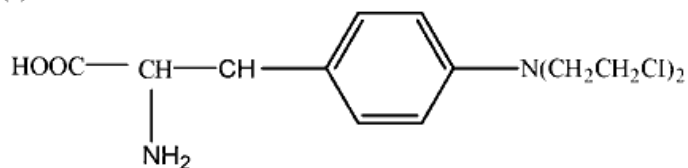
- (a) Amount of alkali released into water
- (b) Amount of acid released into water
- (c) Estimation of silicate level
- (d) Turbidity

1.28 The pH of pharmaceutical buffer system can be calculated by

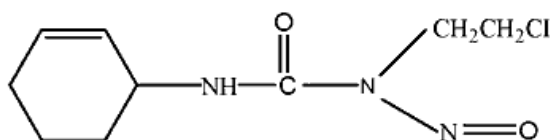
- (a) pH partition theory
- (b) Noyes whitney law
- (c) Henderson-Hasselbaltch equation
- (d) Michalis Menten Equations

1.29 Chlorambucil is an anti-cancer drug. Its structure is

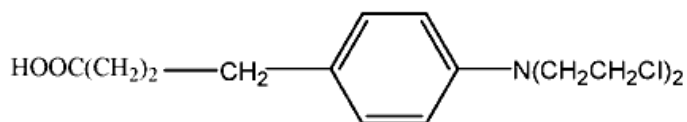
(a)



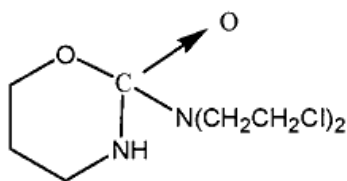
(b)



(c)



(d)



1.30 The stationary phase in TLC is

- |                  |   |
|------------------|---|
| (a) Adsorbent    | (b) Liquid held between glass plate and adsorbent |
| (c) Glass plates | (d) None of the above                             |

1.31 Digoxin:

- (a) Has Its action terminated by metabolism in the liver
- (b) Has A plasma  $t_{1/2}$  of 6 hours
- (c) Should be given half of its normal dose to hypothyroid patients <http://www.xamstudy.com>
- (d) Provide benefit in atrial fibrillation by increasing the force of contraction

1.32 The ingredients mentioned below are commonly used as the coating agents for film coating EXCEPT

- |                                 |                                     |
|---------------------------------|-------------------------------------|
| (a) Cellulose acetate phthalate | (b) Carnauba wax                    |
| (c) Hydroxy ethyl cellulose     | (d) Sodium carboxy methyl cellulose |

1.33 Morphine is the drug of choice for

- |                             |                    |
|-----------------------------|--------------------|
| (a) Urinary tract infection | (b) Colic pain     |
| (c) Bronchial asthma        | (d) Cardiac asthma |

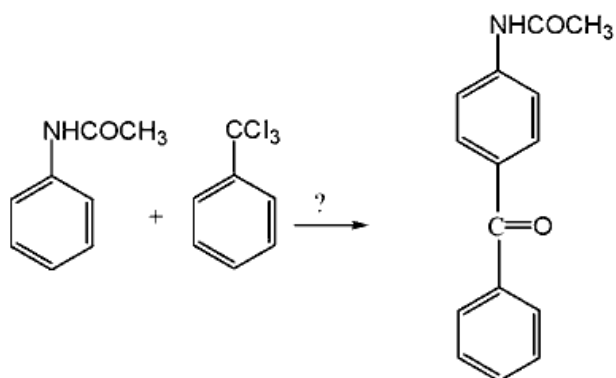
1.34 Drug used in treatment of bronchial asthma usually

- |  |  |
|--|--|
| (a) Block both $\alpha$ and $\beta$ adrenergic receptors     | (b) Stimulate $\alpha$ receptors but block $\beta$ receptor. |
| (c) Stimulate $\beta$ receptors but block $\alpha$ receptor. | (d) Stimulate $\alpha$ and or $\beta$ receptors              |

1.35 The formula for the preparation of ascorbic acid injection I.P. may include

- (a) Glacial acetic acid
- (b) Dilute hydrochloric acid
- (c) Propylene glycol
- (d) Sodium carbonate or sodium bicarbonate or sodium hydroxide in water

1.36 The chemical reaction shown below can be carried out using the reagent listed from A to D Indicate the correct one.



- (a)  $\text{CH}_3\text{HgBr}$
- (b)  $\text{CH}_3\text{Cl}$
- (c)  $\text{AlCl}_3$
- (d)  $\text{CH}_3\text{COONa}$

1.37 Lactose is the most widely used diluent in the tablet formulation. However it is not used in the formulation of one of the following

- (a) Pyrazinamide
- (b) Ibuprofen
- (c) Sulfacetamide
- (d) Isoniazide

1.38 The area under the serum concentration time curve of the drug represents:

- (a) The biological half life of the drug
- (b) The amount of drug in the original dosage form
- (c) The amount of drug absorbed
- (d) The amount of drug excreted in the urine

1.39 Vinca alkaloids are isolated from

- (a) *Catharanthus roseus* and contain indole and indoline moieties
- (b) *Rosco chromogens* and contain indole and indoline moieties
- (c) *Catharanthus roseus* and contain quinoline and quinoline moieties
- (d) *Catharanthus indicus* and contain indole and quinoline moieties

1.40 Aprotic solvent have

- (a) Acidic properties
- (b) Basic properties
- (c) Both acidic and basic properties
- (d) No acidic or basic properties

## SECTION - II

### MATCH THE FOLLOWING

2.1 The antibiotics and their adverse effect are mentioned below

- |                        |                        |
|------------------------|------------------------|
| 1. Chloramphenicol     | A. Hemolytic anaemia   |
| 2. Erythromycin        | B. Hepatotoxicity      |
| 3. Cephalosporins      | C. CNS toxicity        |
| 4. Streptomycin        | D. Nephrotoxicity      |
|                        | E. Ototoxicity         |
| (a) 1-E, 2-B, 3-C, 4-D | (b) 1-A, 2-B, 3-D, 4-E |
| (c) 1-A, 2-B, 3-E, 4-D | (d) 1-A, 2-E, 3-C, 4-D |

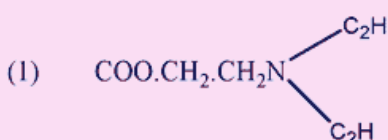
2.2 Permitted limit of ethylene oxide in various products are mentioned below. Match them.

- |                                |                        |
|--------------------------------|------------------------|
| 1. Ophthalmic preparations     | A. 5 ppm               |
| 2. Hard gelatin capsule shells | B. 10 ppm              |
| 3. Surgical material           | C. 15 ppm              |
| 4. Intra uterine devices       | D. 25 ppm              |
|                                | E. 35 ppm              |
| (a) 1-E, 2-B, 3-C, 4-A         | (b) 1-A, 2-B, 3-D, 4-E |
| (c) 1-A, 2-D, 3-C, 4-B         | (d) 1-A, 2-E, 3-C, 4-D |

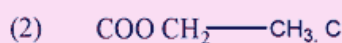
2.3 Expression of the following terms are given A to E. Match them correctly

- |                        |                         |
|------------------------|-------------------------|
| 1. Beer's Law          | A. $T = 1 / I_a$        |
| 2. Absorptivity        | B. $\log I_0 / I = abc$ |
| 3. Absorbance          | C. $a = bc$             |
|                        | D. $\log a = \ln bc$    |
| (a) 1-B, 2-D, 3-A, 4-C | (b) 1-A, 2-B, 3-D, 4-C  |
| (c) 1-A, 2-C, 3-B, 4-D | (d) 1-A, 2-D, 3-C, 4-B  |

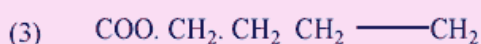
2.4 The side chain as given from 1 to 4 is present in local anesthetics listed A to E. match them correctly



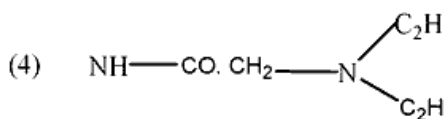
(A) Procaine



(B) Lidocaine



(C) Benzocaine



(a) 1-C, 2-B, 3-A, 4-D

(c) 1-A, 2-C, 3-D, 4-B

(D) Butcsin

(E) Dibucaine

(b) 1-A, 2-C, 3-D, 4-B

(d) 1-A, 2-B, 3-C, 4-D

2.5 Match the suitable test organism for assaying the antibiotics mentioned below

1. Doxycycline

2. Rifampicin

3. Streptomycin

4. Tetracycline

A. *Bacillus cereus*

B. *Bacillus pumilus*

C. *Streptomyces saprophyticus*

D. *Bacillus subtilis*

E. *Micrococcus luteus*

(a) 1-D, 2-A, 3-B, 4-C

(c) 1-A, 2-B, 3-C, 4-D

(b) 1-D, 2-D, 3-A, 4-B

(d) 1-A, 2-C, 3-D, 4-C

2.6 The region of spectrum for the following are given in term of wavelength (cm) in A to E. Match them correctly.

1. X- Rays

2. UV- Rays

3. Visible - Rays

4. Infrared- Rays

A.  $10^6 - 10^5$

B.  $10^5 - 10^4$

C.  $10^8 - 10^6$

D.  $10^4 - 10^2$

E.  $10^2 - 10$

(a) 1-D, 2-B, 3-A, 4-C

(c) 1-D, 2-B, 3-A, 4-D

(b) 1-A, 2-B, 3-D, 4-C

(d) 1-C, 2-A, 3-B, 4-D

2.7 The causative organism of the disease is given and the drug used for the treatment is indicated in A to E. Match them.

1. *E. Histolytica*

2. *P.falciparum*

3. *S. typhi*

4. *M. leprae*

A. Clofazimine

B. Chlorphenicol

C. Emetine

D. Methamine

E. Mebendazole

(a) 1-C, 2-D, 3-B, 4-A

(c) 1-C, 2-B, 3-A, 4-D

(b) 1-A, 2-B, 3-D, 4-C

(d) 1-B, 2-A, 3-D, 4-C

2.8 Match the correct mechanism of action for the diuretic agents mentioned below

1. Acetazolamide

2. Chlorthiazide

3. Spironolactone

A. Increases the serum  $\text{K}^+$  level

B. Competitively antagonizes aldosterone

C. Inhibit active  $\text{Na}^+$  secretion, decreasing  $\text{K}^+$  excretion in distal nephron

4. Triamterene
- (a) 1-E, 2-B, 3-C, 4-D  
(c) 1-D, 2-E, 3-B, 4-C
- D. Inhibit Carbonic anhydrase  
E. Inhibit electrolyte re-absorption in the distal portion of ascending limb of the loop of Henle.
- (b) 1-A, 2-B, 3-D, 4-E  
(d) 1-A, 2-E, 3-C, 4-D

2.9 The position -5 of barbituric acid analogues mentioned below have substituents as indicated in A to E. Match them properly to identify correct structure.

1. Phenobarbital  
2. Barbital  
3. Probarbital  
4. Pentobarbital
- A.  $-C_2H_5, -C_2H_5$   
B.  $-C_2H_5, -CH(CH_3)_2$   
C.  $-C_2H_5, -C_6H_5$   
D.  $-C_2H_5, -CH(CH_3)-CH_2-CH_2-CH_3$   
E.  $-CH_3, -C_6H_5$
- (a) 1-C, 2-B, 3-A, 4-D  
(c) 1-C, 2-B, 3-A, 4-D
- (b) 1-A, 2-B, 3-D, 4-C  
(d) 1-A, 2-D, 3-B, 4-C

2.10 The following drug can be prepared starting from the intermediate given in A to E. Match them

1. Atenolol  
2. Ibuprofen  
3. Haloperidol  
4. Isoniazide
- A. 4-OH phenylacetamide  
B.  $\gamma$ -picoline  
C. 4-NH<sub>2</sub> quinoline  
D. Isobutyl benzene  
E. 4-(p-chlorophenyl) 4-OH piperidine
- (a) 1-E, 2-B, 3-C, 4-D  
(c) 1-C, 2-B, 3-E, 4-D
- (b) 1-A, 2-D, 3-E, 4-B  
(d) 1-A, 2-E, 3-C, 4-D

2.11 Choose the most appropriate instruments / apparatus listed from A to E for the study of the following

1. Thiamine  
2. Ferrous ions  
3. Acidity of carboxylic acid  
4. Barium sulphate
- A. Colorimeter  
B. pH meter  
C. Fluorimeter  
D. Colourimeter  
E. Nephelometer
- (a) 1-E, 2-B, 3-C, 4-D  
(c) 1-A, 2-B, 3-E, 4-D
- (b) 1-A, 2-B, 3-D, 4-E  
(d) 1-C, 2-D, 3-B, 4-E

2.12 Following drugs are tested with reagents listed in A to E. Match them correctly

1. Asparic acid  
2. Dextran  
3. Nicotine
- A.  $\alpha$ -Naphthol in alcohol  
B. 2, 6-dichlorophenol indophenol  
C. Ninhydrin



4. Vitamin A
- (a) 1-E, 2-B, 3-A, 4-D  
(c) 1-C, 2-A, 3-E, 4-D
- D. Antimony trichloride in chloroform  
E. Potassium bismuth iodide solution  
(b) 1-A, 2-B, 3-D, 4-E  
(d) 1-C, 2-D, 3-B, 4-E

2.13 Match the antibiotics with their mechanism of action correctly

1. Ampicillin  
2. Chloramphenicol  
3. Nystatin  
4. Rifampicin
- (a) 1-E, 2-B, 3-C, 4-D  
c) 1-D, 2-B, 3-E, 4-A
- A. Inhibition of nucleic acid synthesis  
B. Inhibition of cell wall synthesis  
C. Inhibition of growth by competitive antagonism  
D. Inhibition of protein synthesis  
E. Inhibition of cell membrane function  
(b) 1-B, 2-D, 3-E, 4-A  
(d) 1-C, 2-A, 3-B, 4-E

2.14 As per drug and cosmetics acts, match correct schedule to their respective titles

1. Schedule P  
2. Schedule Q  
3. Schedule S  
4. Schedule FF
- (a) 1-E, 2-B, 3-C, 4-D  
(c) 1-D, 2-E, 3-B, 4-C
- A. Standard for poison  
B. Standard for cosmetics  
C. Standard for ophthalmic preparations  
D. Life period of the drug  
E. Coal tar colour used in cosmetics.  
(b) 1-A, 2-B, 3-D, 4-C  
(d) 1-C, 2-D, 3-B, 4-A

2.15 The source and constituents of the following umbelliferous fruits are listed in A to D. Match them correctly

1. Caraway  
2. Fennel  
3. Dill  
4. Coriander
- (a) 1-B, 2-A, 3-C, 4-E  
(c) 1-A, 2-B, 3-E, 4-D
- A. *Foeniculum vulgare* – Anethole / Fenchone  
B. *Carum carvi*– Carvone  
C. *Anethum graveolens*– Cuminaldehyde  
D. *Coriandrum sativum*– linalool  
(b) 1-C, 2-B, 3-D, 4-E  
(d) 1-C, 2-D, 3-B, 4-A

2.16 Given below are the microscopic diagnostic features of the drug listed in A to E. Choose the appropriate one.

1. Cluster crystal of calcium oxalate  
2. Candelabra trichomes  
3. Phloem fibres  
4. Glandular trichomes
- (a) 1-A, 2-B, 3-C, 4-D  
(c) 1-D, 2-B, 3-E, 4-C
- A. *Stramonium* leaves  
B. *Cinamon bark*  
C. *Alexandrian senna*  
D. *Digitalis purpurea*  
E. *Verbascum thapsus*  
(b) 1-A, 2-E, 3-B, 4-D  
(d) 1-C, 2-A, 3-B, 4-E

2.17 In the preparation of capsule shell the ingredients mentioned are present for the specific purpose.

Match them.

- |                          |                     |
|--------------------------|---------------------|
| 1. Preservatives         | A. Mineral oil      |
| 2. Aids Solubility       | B. Essential oil    |
| 3. Organoleptic additive | C. Titanium dioxide |
| 4. Opacifier             | D. Fumaric acid     |
|                          | E. Propyl paraben   |
- (a) 1-E, 2-B, 3-A, 4-D      (b) 1-A, 2-B, 3-D, 4-E  
(c) 1-E, 2-D, 3-B, 4-C      (d) 1-C, 2-D, 3-A, 4-E

2.18 The emulsent and their sources are given below. Match them

- |               |                 |
|---------------|-----------------|
| 1. Karaya     | A. Synthetics   |
| 2. Carageenan | B. Collegen     |
| 3. Gaur       | C. Sea wood     |
| 4. Gelatin    | D. Gum exudates |
|               | E. Seed extract |
- (a) 1-E, 2-A, 3-B, 4-D      (b) 1-C, 2-B, 3-D, 4-E  
(c) 1-A, 2-B, 3-E, 4-D      (d) 1-D, 2-C, 3-E, 4-B

2.19 List below are some schedules 1 to 4 and the rule A to E. match them correctly

- |      |   |
|------|---|
| 1. C | A. List of medicine required to be taken only under supervision of R.M.P. |
| 2. F | B. Biological and special products  |
| 3. G | C. Provision applicable to vaccines, toxins, antigens and Sera            |
| 4. M | D. GMP requirement of factory premises plants, Equipment etc.             |
|      | E. Standards for surgical dressing  |

(a) 1A, 2-B, 3-C, 4-D      (b) 1-A, 2-B, 3-D, 4-C

(c) 1-B, 2-C, 3-A, 4-D      (d) 1-C, 2-D, 3-B, 4-A

2.20 Preparation listed 1 to 4 are assayed by the given in A to E. Match them correctly

- |                                      |  |
|--------------------------------------|--|
| 1. Heparin sodium injection I.P.     | A. Biological assay using prostate glands of immature rats           |
| 2. Gentamycin injection I.P.         | B. Biological assay using <i>clostridium welchi</i> Type A antitoxin |
| 3. Mixed gonadotropin antitoxin I.P. | C. Microbiological assay using method A                              |
| 4. Chorionic gonadotropin inj. I.P.  | D. Biological assay using sheep plasma                               |
|                                      | E. Biological assay using human plasma                               |
- (a) 1-C, 2-B, 3-A, 4-D      (b) 1-A, 2-C, 3-D, 4-B  
(c) 1-D, 2-C, 3-B, 4-A      (d) 1-C, 2-D, 3-A, 4-B

## PART - B

**(Marks : 120)**

**N.B. 1.** Answer any twenty questions.

2. If more than 20 questions are attempted, only the first 20 will be considered.

3. All questions carry equal marks.

3. (a) Give the systematic names, structural formulas of some biological important purine bases  
(b) What is biuret test? Which type of compounds are usually tested ?  
(c) Caffeine on treatment with  $\text{KClO}_3$  and  $\text{HCl}$  gave two products. What are they ? Give complete equation
4. Give the IP assay method for sodium ascorbate IP (Monosodium -1- ascorbate) Give reaction
5. (a) Give an expression for Stoke's law  
(b) What does it indicates ?
6. (a) How do you test for rancidity of Archis oil IP ?  
(b) Ascorbic acid  $\xrightarrow[\text{Boil}]{\text{HCl}}$  A + B + C, What are A, B and C ?
7. Give complete equation  

$$\alpha\text{-terpineol} \xrightarrow{\text{NOCl}} \text{A} \xrightarrow{\text{Re arrangement}} \text{B} \xrightarrow[-\text{HCl}]{\text{C}_2\text{H}_5\text{ONa}} \text{C} \xrightarrow[\Delta - \text{H}_2\text{O}]{\text{H}_2\text{SO}_4} \text{D}$$
 what are A,B, C, and D ? Given the complete equation.
8. (a) What is HLB ?  
(b) Draw the HLB scale and suggest suitable classification for various surfactant on basis of HLB value of scale  
(c) A polyhydric alcohol fatty acid ester gave a saponification number 48.0 , the corresponding acid gave an acid number of 280. What is HLB value of ester ?
9. Give the pharmacology of the following. Answer should not exceed 4 sentence in each case  
(a) Nitrazepam      (b) Ethacranic acid      (c) Hydralazine HCl
10. (a) What is passive diffusion? Give the mathematical representation of Ficks law of diffusion.  
(b) A 250 ml infusion contain 18.65 g of potassium chloride. How many milliequivalent of KCl are present ?  
Mol. Wt of KCl = 74.6.
11. (a) Suggest the names of important types of stomata according to the characters of guard cells  
(b) Give the name of 3 different types of trichomes present in medicinal plants. What is Cicatrix?
12. Draw complete equation to show what happen when following reaction are carried out ?  
(a) Tropine is treated with mandelic acid  
(b) Morphine is demethylated and product allylated  
(c) Cocaine is treated with hot dilute acid

13. (a) Write the full structure of any three drugs which are prepared starting from m-chloroaniline.  
 (b) Give chemical nomenclature of chlordiazepoxide
14. (a) Name the three physicochemical properties which are important for drug activity.  
 (b) The  $K_a$  of acetic acid is  $1.75 \times 10^{-5}$ . Calculate  $pK_a$
15. The general structure of tetracycline is an octahydro analogue of naphthalene on which a number of substituents are possible. Write the structure and number of the positions.
16. Why glucuronidation is most common conjugative pathway in drug metabolism? Give three reasons. Give one example of one drug molecule.
17. (a) What is major difference between the following chromatographic techniques?  
 (i) Paper and thin layer chromatography  
 (ii) Gas-liquid and high pressure liquid chromatography  
 (b) Define Gradient elution
18. Product A, B, C, and D are formed by the following chemical reactions. Complete the equation by writing the structures. <http://www.xamstudy.com>
- $\alpha$ -naphthol + Epichlorhydrine  $\rightarrow$  (A)
  - (A) + isopropylene  $\rightarrow$  (B)
  - Piperazine + Diethyl carbamylchloride  $\rightarrow$  (C)
  - (C) + Methyl iodide  $\rightarrow$  (D)
19. (a) Write the tautomeric form of barbituric acid  
 (b) Give synthesis of metronidazole
20. Caffeine has the UV absorption maximum at 272 m $\mu$ . 1316 g of this drug was dissolved in enough water to make 1 litre. Exactly 10 ml of this solution was diluted to 100 ml and absorbance of this solution in 1.0 cm cell at 272 m $\mu$  was 0.854.
- Calculate molar absorptivity of caffeine
  - Calculate the concentration of unknown solution of this drug which gave an absorbance of 1.022 in 2.0 cm of cell
- The molecular weight of caffeine is 194.2
21. The IR absorption bands of an organic compound are observed as follows:  
 3080, 2960, 1680, 1580, 1430, 1360, 755 and 690  $\text{cm}^{-1}$ . Indicate the functional groups corresponding to these bands (The empirical formula of this compound is  $\text{C}_8\text{H}_8\text{O}$ )
22. Define the following term used in parenteral filtration:  
 (a) Polishing (b) Cold sterilization (c) Impaction
23. Describe the terms mentioned below and give two examples of each  
 (a) Antipruritis (b) Keratoplastics (c) Keratolytics

24. (a) What is sterile water for injection? How you will identify the oxidisable impurities in it?  
 (b) Calculate the amount of sodium chloride required to adjust 500 ml of a 0.5 %solution of procaine hydrochloride isotonic with blood plasma.  
 The F.P.D. of 1% solution of procaine HCl is  $-0.12^{\circ}\text{C}$  and sodium chloride is  $-58^{\circ}\text{C}$ .
25. Mention the possible drug-drug interaction of the following combinations  
 (a) Aluminum hydroxide gel with isoniazide  
 (b) Aspirin with heparin injection  
 (c) Phenytoin with sulphasomidine
26. Define the following terms used in tablets coating  
 (a) Opaquants (b) Bridging (c) Compression coating
27. Define the term mentioned below used in aerosol technology :  
 (a) Leak test (b) Biological test (c) Spray test

**End of paper**

**ANSWER KEY GATE 1991**

**Section -I**

1.1	b	1.2	a	1.3	b	1.4	a
1.5	b	1.6	c	1.7	c	1.8	a
1.9	c	1.10	a	1.11	b	1.12	a
1.13	a	1.14	a	1.15	a	1.16	c
1.17	c	1.18	b	1.19	d	1.20	b
1.21	a	1.22	c	1.23	b	1.24	b
1.25	c	1.26	a	1.27	a	1.28	d
1.29	a	1.30	a	1.31	d	1.32	b
1.33	b	1.34	b	1.35	d	1.36	c
1.37	d	1.38	c	1.39	a	1.40	d

**Section -II**

2.1	b	2.2	c	2.3	a	2.4	c
2.5	b	2.6	d	2.7	a	2.8	c
2.9	a	2.10	b	2.11	d	2.12	c
2.13	b	2.14	c	2.15	a	2.16	b
2.17	c	2.18	d	2.19	c	2.20	c

# GPAT QUESTION PAPER 1990 WITH ANSWER KEY

## PY-PHARMACEUTICAL SCIENCES

Time : 3 hours

Maximum Marks : 200

- N. B.
- (1) This question paper contains two parts, A and B.
  - (2) Answer all questions from Part A.
  - (3) Answer any 20 questions from Part B.
  - (4) There will be no negative marking.

### PART - A

- N. B.
- (1) There are 2 Section in this part.
  - (2) Answer all question in both Section 1 and 2.
  - (3) Answer should be given in serial order in the answer book.
  - (4) Do not skip questions while writing the answers.
  - (5) Write the question number and show your answer by writing the alphabet (Against the No.) in capital letters.
  - (6) In section 1 each question carries 1 mark
  - (7) In section 2 each question carries 2 marks.
  - (8) A model is shown at the beginning of each section in part A.
  - (9) Answer to the question in this must be written in the first 3 (three) pages of the answer books only.

### SECTION - A

## CHOOSE THE CORRECT ANSWER

### Multiple choice Questions

1.1. Reserpine on hydrolysis gives :

- Reserpic acid + Methyl alcohol + Trimethoxy cinnamic acid
- Reserpic acid + Acetic acid + Trimethoxy benzaldehyde
- Reserpic acid + Methyl alcohol + Trimethoxy benzoic acid
- Reserpic acid + Methyl alcohol + Trimethoxy cinnamaldehyde

1.2. Papaverine is

- 6,7 - dimethoxy -1- (3',4' - dimethoxy benzyl) isoquinoline
- 6,7 - dimethoxy -1- (3',4' - dimethyl benzyl) isoquinoline
- 6,7 - dimethoxy -1- (3',4' - dimethoxy benzyl) quinolone
- 6,7 - dimethoxy -1- (3',4' - dimethyl benzyl) quinolone



1.3. Titanium dioxide is commonly present in

- (a) Vanishing cream
- (b) Sunscreen cream
- (c) Aqueous calamine cream
- (d) Ophthalmic cream

1.4. Powder ergot when treated with sodium hydroxide solution develops

- (a) A strong odour of ammonia
- (b) A strong odour of trimethyl amine
- (c) A strong odour of indol
- (d) A strong odour of urea

1.5. Salbutamol sulphate IP is assayed by

- (a) Direct titration with standard sodium hydroxide solution
- (b) Direct titration with standard sodium hydrochloric acid
- (c) A known amount of standard acid is added and excess is titrated with standard alkali
- (d) Dissolve in glacial acetic acid and titrated with standard perchloric acid using oracet blue.

1.6. Heparin prevent blood coagulation by

- (a) Inhibiting thrombin catalysed conversion of fibrinogen to fibrin
- (b) Precipitate blood calcium thereby prevent coagulation reactions
- (c) Inhibiting enzyme reactions
- (d) Converting ionized calcium into chelation

1.7. For the registration of pharmacist in the various states, the Pharmacy Act provide for the constitution of:

- (a) Registration of tribunals
- (b) Registrar of Co-operative societies
- (c) Registrar of state pharmacy council
- (d) Registrar of central pharmacy council

1.8. Powdered digitalis is dried at temperature :

- (a) Not exceeded 60°C
- (b) 65 °C
- (c) 75 °C
- (d) 100 °C

1.9. Prazepam differ in structure from diazepam by

- (a) N- methyl group
- (b) N -cyclopropyl group
- (c) N-cyclopropyl methyl group
- (d) N-propyl group

1.10. The mechanism of action of rifampicin involve

- (a) Inhibition of bacterial DNA directed RNA polymerase
- (b) Inhibition of mycolic acid synthesis
- (c) Inhibition of protein synthesis
- (d) Inhibition of transpeptidase

1.11. The UV- visible region in the electromagnetic spectrum of radiation is

- (a) 200 – 400 nm
- (b) 300 – 660 nm
- (c) 400 – 800 nm
- (d) 200 – 800 nm

1.12. The Mantoux test uses

- (a) Old tuberculin
- (b) Diptheria toxins
- (c) Serum antigens
- (d) Polysaccharide antigens

1.13. Rotosort is a machine used to sort out :

- (a) Coated tablets
- (b) Filled capsule
- (c) Sealed ampoules
- (d) Sealed containers

1.14. The volume of distribution of drugs is

- (a) An expression of total body volume
- (b) A measure of total fluid volume
- (c) A relationship between the total amount of drug in the body and the concentration of the drug in the blood
- (d) Proportional to bioavailability of the drug

1.15. Resolution of a spectrophotometer is

- (a) Its wave length range
- (b) Its ability to distinguish adjacent absorption bands
- (c) Its capacity for its continuous use
- (d) Its power to gather light according to source

1.16. Haloperidol is a major tranquillizer. It belongs to the class of

- (a) Carbamates
- (b) Propanediol
- (c) Butyrophenone
- (d) Phenothiazine

1.17. Glandular hair growing having a unicellular or occasionally a short uniseriate pedicel with a unicellular or bicellular terminal gland is characteristic of

- (a) Senna leaves
- (b) Belladonna leaves
- (c) Datura stramonium leaves
- (d) Digitalis Purpurea leaves

1.18. Skeletal muscle relaxation produced by the drug ..... is effectively antagonized by neostigmine

- (a) Diazepam
- (b) Succinylcholine
- (c) Tubocurarine
- (d) Aminophylline

1.19. Vitamin D<sub>2</sub> is

- (a) 22,23-dihydro -5,6 cis -ergocalciferol
- (b) 5,6 cis- chlorcalciferol
- (c) 7- dehydrocholesterol
- (d) 21,24 - dihydro 5,6 cis ergocalciferol

1.20. R.W.C. is used to identify the strength of an

- (a) Antibiotics
- (b) Antipyretics
- (c) Antiseptic
- (d) Antiinflammatory

1.21. The colligative property of a solution is related to the

- (a) Total number of solute particles
- (b) pH
- (c) Number of ions
- (d) Number of ingredients

1.22. The essential structural unit for the anthelmintic activity of mebendazole is

- (a) Benzoyl group
- (b) Benzimidazole
- (c) Methyl carbamates
- (d) Imidazole

1.23. The anticoagulant activity of heparin sodium injection IP is estimated by using :

- (a) Female rats
- (b) Male rats
- (c) Rabbits
- (d) Sheep

1.24. The biological half-life of a drug (first order kinetics) is represented by

- (a)  $1/K$
- (b)  $\log K$
- (c)  $0.693 / K$
- (d)  $2.303 / K$

1.25. Infra-red spectrometry is a convenient method for understanding of

- (a) Drug receptor interaction
- (b) Functional group identification
- (c) Physicochemical properties
- (d) Conformational properties

1.26. Most commonly used antimicrobial agent for intraperitoneal dialysis fluid is

- (a) Chlorocresol
- (b) Benzalkonium chloride
- (c) Isopropyl alcohol
- (d) None of the above

1.27. In the steroid nucleus, there are

- (a) Six chiral center with nucleus i.e. 5,8,9,10,13, and 14
- (b) Seven chiral center with nucleus i.e. 3,8,9,10,11, 12 and 14
- (c) Six chiral center with nucleus i.e. 3,8,9,10,11, and 12
- (d) Six chiral center with nucleus i.e. 5,7,9,10,13, and 16

1.28. Thermolabile immiscible liquid can be separated by

- (a) Decantation
- (b) Dilution
- (c) Capacity centrifugation
- (d) Counter current distribution

1.29. Sulphomethoxazole is an antibacterial drug. It is a

- (a) Short acting drug
- (b) Short and intermediate acting drugs
- (c) Long acting drugs
- (d) Mixed acting drugs

1.30. Wave number is the number of waves

- (a) Per second
- (b) Per centimeter
- (c) Per inch
- (d) Per centimeter<sup>3</sup>

1.31. The raw material for the synthesis of propranolol is

- (a)  $\alpha$  - naphthylamine
- (b)  $\beta$  naphthol
- (c)  $\alpha$  naphthol
- (d) 1- naphthaldehyde

1.32. All the statements mentioned below about chloral hydrate is true EXCEPT that it

- (a) Produces hypnosis
- (b) Produces analgesia
- (c) Produce dependence
- (d) Irritate gastric mucosa

1.33. In drug and cosmetics act and rules thereunder, list of substances that should be sold by retail only on prescription of registered medical practitioner is given in

- (a) Schedule H
- (b) Schedule V
- (c) Schedule X
- (d) Schedule Q

1.34. Which is ideal combination for testing the solubility of an enteric coated capsule in alkaline medium ?

- (a) Sodium bicarbonate + Potassium hydroxide + Pepsin <http://www.xamstudy.com>
- (b) Sodium bicarbonate + Sodium tauroglycocholate + Papain
- (c) Sodium bicarbonate + Pancreatin + Sodium tauroglycocholate
- (d) Sodium bicarbonate + Billirubin

1.35. Oxazepam is used in relief of psychoneurosis. It has lower incidents of side effects and reduced toxicity due to

- (a) N-demethylation
- (b) Ring oxidation
- (c) Aromatic hydroxylation
- (d) Conjugation of 3- hydroxyl group

1.36. The rate of diffusion of drug across biological membrane is

- (a) Directly proportional to the concentration gradients
- (b) Dependent on route of administration

- (c) Indirectly proportional to membrane thickness
- (d) None of the above

1.37. In sugar coating of tablets subcoating is done

- (a) To prevent moisture deposition
- (b) To round the edge and build tablet size
- (c) To smoothen the surface
- (d) To prevent the tablet from breaking due to vibration

1.38. One of the detectors used in gas chromatography

- (a) Bolometer
- (b) Thermal conductivity detector
- (c) Golay detectors
- (d) Giger Counter

1.39. Alkaloids in chinchona bark are detected by

- (a) Iodine test
- (b) Thalleioquine test
- (c) Liebermann –Burchard test
- (d) Nessler's test

1.40. 2-amino -5-chlorobenzophenone is the convenient starting material for the synthesis of

- (a) Nitrazepam
- (b) Diazepam
- (c) Chloramphenicol
- (d) Trimethoprim

## SECTION - B

### MATCH THE FOLLOWING

2.1 Given below are some of the associate colloids, Match the correct type from the list A to E

- |  |                |
|--|----------------|
| 1. Sodium lauryl sulphate                    | A. Anionic     |
| 2. Cetyl trimethyl ammonium bromide          | B. Cationic    |
| 3. Polyoxy ethylene lauryl ether             | C. Nonionic    |
| 4. Dimethyl dodecyl ammonio propane sulphate | D. Ampholytics |
|  | E. None        |

- (a) 1-B, 2-A, 3-D, 4-C
- (b) 1-A, 2-B, 3-C, 4-D
- (c) 1-C, 2-D, 3-A, 4-E
- (d) 1-A, 2-B, 3-C, 4-E

2.2 Given below are the essential pharmacophores for the drugs mentioned from A to E, match them

- |  |                |
|--|----------------|
| 1. 1, 4 benzodiazepine                     | A. Pindolol    |
| 2. $\beta$ -lactum fused with thiazolidine | B. Amoxicillin |
| 3. Ethylene diamine                        | C. Ethambutol  |
| 4. Aryloxypropanolamine                    | D. Salbutamol  |
|  | E. Oxazepam    |

- (a) 1-B, 2-A, 3-D, 4-C
- (b) 1-A, 2-B, 3-C, 4-D
- (c) 1-E, 2-B, 3-C, 4-A
- (d) 1-A, 2-B, 3-C, 4-E

2.3 The drugs mentioned below are produced by species mentioned from A to D.

- |                   |                                     |
|-------------------|-------------------------------------|
| 1. Rifampicin     | A. <i>Streptomyces griseus</i>      |
| 2. Nystatin       | B. <i>Bacillus polymyxa</i>         |
| 3. Amphotericin B | C. <i>Streptomyces mediterranei</i> |
| 4. Candicidin     | D. <i>Streptomyces nodosus</i>      |
|                   | E. <i>Streptomyces noursei</i>      |
- (a) 1-B, 2-A, 3-E, 4-C                      (b) 1-A, 2-B, 3-C, 4-D  
(c) 1-E, 2-B, 3-C, 4-A                      (d) 1-C, 2-E, 3-D, 4-B

2.4 Given below are some important drugs. find out the correct constitution listed A to E derived from them

- |                               |                            |
|-------------------------------|----------------------------|
| 1. <i>Cephalis ipecacunha</i> | A. Cineole                 |
| 2. <i>Papaver Somniferous</i> | B. Safrole and myresticin  |
| 3. <i>Cascara sagrada</i>     | C. Morphine                |
| 4. <i>Myristica fragrans</i>  | D. Anthraquinone glycoside |
|                               | E. Emetine                 |
- (a) 1-E, 2-C, 3-D, 4-B                      (b) 1-A, 2-B, 3-C, 4-D  
(c) 1-E, 2-B, 3-C, 4-A                      (d) 1-C, 2-E, 3-B, 4-D

2.5 The side chain responsible for the biological activity of drug listed from A to E are given below. match them correctly

- |   |                    |
|---|--------------------|
| 1. $\text{—NH—CH—CH}_2\text{—CH}_2\text{—N(C}_2\text{H}_5)_2$<br> <br>CH <sub>3</sub> | A. Amodiaquine     |
| 2. $\text{—CH}_2\text{—CH}_2\text{—SO}_2\text{—CH}_2\text{—CH}_2$                     | B. Tinidazole      |
| 3. $\text{—O—CH}_2\text{—CH}_2\text{—N(CH}_3)_2$                                      | C. Choroquine      |
| 4. $\text{—NH—C}_6\text{H}_3(\text{OH})\text{CH}_3\text{N(C}_3\text{H}_5)_2$          | D. Diphenhydramine |
|   | E. Chlorpromazine  |
- (a) 1-C, 2-B, 3-D, 4-A                      (b) 1-A, 2-B, 3-C, 4-D  
(c) 1-E, 2-B, 3-C, 4-A                      (d) 1-C, 2-E, 3-B, 4-A

2.6 The following form under schedule A of the drug and cosmetics act utilized for applying for licenses listed A to E, match them

- |              |   |
|--------------|---|
| 1. Form 8    | A. Application to import drugs for personal use                       |
| 2. Form 12 A | B. Application for grant of license to sell, stock or distribute drug |
| 3. Form 19   | C. Application to import biological products                          |
| 4. Form 24 C | D. Application to manufacture homeopathy drugs                        |
|              | E. Application to important drugs for research purposes               |
- (a) 1-B, 2-A, 3-D, 4-C                      (b) 1-A, 2-B, 3-C, 4-D  
(c) 1-C, 2-A, 3-B, 4-D                      (d) 1-C, 2-E, 3-B, 4-D



2.7 Listed below are the instruments used for measuring the factors given in A to E. match them

- |                               |   |
|-------------------------------|---|
| 1. Rotational viscometer      | A. Shear rate                                       |
| 2. Penetrometer               | B. Melting point                                    |
| 3. Hansen-paddle equipment    | C. For consistency and hardness of relatively rigid |
| 4. Glass electrode semisolids | D. Dissolution of granules and tablets              |
|                               | E. pH indicating electrode                          |

(a) 1-B, 2-A, 3-D, 4-C

(b) 1-A, 2-C, 3-D, 4-E

(c) 1-E, 2-B, 3-C, 4-A

(d) 1-C, 2-E, 3-B, 4-D

2.8 Symptoms for the following diseases are indicated from A to E. match them

- |                       |                                     |
|-----------------------|-------------------------------------|
| 1. Cushing's syndrome | A. Hyperthyroidism                  |
| 2. Addison's disease  | B. Inflammatory bowel               |
| 3. Grave's disease    | C. Decreases production of cortisol |
| 4. Crohn's disease    | D. Increased production of cortisol |

(a) 1-B, 2-A, 3-D, 4-C

(b) 1-A, 2-B, 3-C, 4-D

(c) 1-E, 2-C, 3-A, 4-B

(d) 1-C, 2-A, 3-B, 4-D

2.9 Some possible causes are mentioned in A to E for the following defects during the film coating of tablets, match them

- |                |   |
|----------------|---|
| 1. Chipping    | A. Poor spreading of sprayed droplets                             |
| 2. Cracking    | B. Overheating during spraying                                    |
| 3. Orange peel | C. High internal stresses in film                                 |
| 4. Blistering  | D. Excess coating process   |
|                | E. Precipitate of polymer due to high temperature or poor solvent |

(a) 1-B, 2-A, 3-D, 4-C

(b) 1-A, 2-B, 3-C, 4-D

(c) 1-E, 2-B, 3-C, 4-A

(d) 1-D, 2-C, 3-A, 4-B

2.10 Match the biological activity listed under A to E for following drugs

- |   |                   |
|---|-------------------|
| 1. O-2-naphthyl- m, N-dimethylthio carbanilaste                         | A. Antineoplastic |
| 2. Trans - 1,4,5,6 -tetrahydro-1-methyl-2[2-(2-thienyl)vinyl]Pyrimidine | B. Anthelmintic   |
| 3. 2,4-diamino -5-(p-chorophenyl)-6-ethylpyrimidine                     | C. Antimicrobial  |
| 4. p-(di-2-choroethyl) aminophenyl butyric acid                         | D. Antifungal     |

(a) 1-D, 2-B, 3-C, 4-A

(b) 1-A, 2-B, 3-C, 4-D

(c) 1-D, 2-B, 3-C, 4-A

(d) 1-C, 2-A, 3-B, 4-D

2.11 Match the correct method of sterilization listed A to E for the following drugs

- |                           |   |
|---------------------------|---|
| 1. Tetracycline injection | A. Sterilized by dry heat                 |
| 2. Insulin injection      | B. Sterilized by heating with bactericide |
| 3. Quinine injection      | C. Sterilized by bacterial filtration     |
| 4. morphine injection     | D. Sterilized by aseptic method           |
|                           | E. Sterilized by heating in an autoclave  |



- (a) 1-B, 2-A, 3-D, 4-C  
 (c) 1-E, 2-B, 3-C, 4-A
- (b) 1-A, 2-B, 3-C, 4-D  
 (d) 1-D, 2-C, 3-E, 4-B

2.12 Given below are the receptors and their antagonists. match them correctly

- |                                      |                  |
|--------------------------------------|------------------|
| 1. GABA receptors                    | A. Buprenorphine |
| 2. Histamine $\text{GH}_2$ receptors | B. Diazepam      |
| 3. Opiate receptors                  | C. Ranitidine    |
| 4. $\beta$ -adrennergic receptors    | D. Nifedipine    |
|                                      | E. Atenolol      |

- (a) 1-B, 2-A, 3-D, 4-C  
 (c) 1-E, 2-B, 3-C, 4-A
- (b) 1-B, 2-C, 3-A, 4-E  
 (d) 1-C, 2-E, 3-B, 4-D

2.13 The names of equations for various expression are given below. match them Correctly

- |   |                  |
|---|------------------|
| 1. $i_d = 607nCD^{1/2}m^{2/3}t^{1/6}$     | A. Mark- Houwink |
| 2. $V = \frac{\pi r^4 t \Delta P}{8 \ln}$ | B. Likovic       |
| 3. $[n] = kM_\alpha$                      | C. Poiseuille    |
| 4. $T_g = (0.5 - 0.67) T_m$               | D. Boyer-Beaman  |
|   | E. Beer-lambert  |

- (a) 1-B, 2-A, 3-D, 4-C  
 (c) 1-B, 2-C, 3-A, 4-D
- (b) 1-A, 2-B, 3-C, 4-D  
 (d) 1-C, 2-A, 3-B, 4-D

2.14 The various equipments are used for size reduction of material of different nature. Match them correctly

- |                      |                          |
|----------------------|--------------------------|
| 1. Rod mill          | A. Sticky material       |
| 2. Fluid energy mill | B. Abrasive material     |
| 3. Cutting mill      | C. Thermolabile material |
| 4. Revolving mill    | D. Fibrous material      |
|                      | E. Thermostable material |

- (a) 1-B, 2-A, 3-D, 4-C  
 (c) 1-A, 2-C, 3-D, 4-B
- (b) 1-A, 2-B, 3-C, 4-D  
 (d) 1-C, 2-E, 3-B, 4-D

2.15 Match the drugs in A to E which inhibit the following enzymes

- |                          |                   |
|--------------------------|-------------------|
| 1. Carbonic anhydrase    | A. Dicloxacillin  |
| 2. Dihydrofolatesynthase | B. Physostigmine  |
| 3. $\beta$ -lactumase    | C. Acetazolamide  |
| 4. Acetylcholinesterase  | D. Sulphanilamide |
|                          | E. Ibuprofen      |

- (a) 1-B, 2-A, 3-D, 4-C  
 (c) 1-E, 2-B, 3-C, 4-A
- (b) 1-A, 2-B, 3-C, 4-D  
 (d) 1-C, 2-D, 3-A, 4-B

2.16 Given below are some of the important drugs. appropriate tests are listed in A to E. match them correctly

- |                        |                                |
|------------------------|--------------------------------|
| 1. Cardiac glycoside   | A. p-dimethylaminobenzaldehyde |
| 2. Ergot alkaloids     | B. Fluorescence test           |
| 3. Quinidine sulphate  | C. Liebermann Burchard test    |
| 4. Camphor             | D. 2,4 dinitrophenyl hydrazine |
|                        | E. Benedict's test             |
| (a) 1-B, 2-A, 3-D, 4-C | (b) 1-A, 2-B, 3-C, 4-D         |
| (c) 1-E, 2-A, 3-B, 4-D | (d) 1-C, 2-E, 3-B, 4-D         |

2.17 The undesirable effects of the antibiotics are listed in A to E. match them

- |                        |                            |
|------------------------|----------------------------|
| 1. Tetracycline        | A. Gray-baby syndrome      |
| 2. Strptomycin         | B. Discolouration of teech |
| 3. Chloramphenicol     | C. Jaundice                |
| 4. Rifampicin          | D. Obesity                 |
|                        | E. Ototoxicity             |
| (a) 1-B, 2-E, 3-A, 4-C | (b) 1-A, 2-B, 3-C, 4-D     |
| (c) 1-E, 2-B, 3-C, 4-A | (d) 1-C, 2-E, 3-B, 4-D     |

2.18 Choose the most appropriate strating material listed in A to E for the synthesis of the following

- |                        |                                       |
|------------------------|---------------------------------------|
| 1. Riboflavin          | A. p-antisidine                       |
| 2. Progesterone        | B. 3,4 diemthyl aniline and D- ribose |
| 3. Isoniazide          | C. Diosgenin                          |
| 4. Indomethacin        | D. $\gamma$ - picoline                |
|                        | E. Lumiflavine                        |
| (a) 1-B, 2-C, 3-D, 4-A | (b) 1-A, 2-B, 3-C, 4-D                |
| (c) 1-E, 2-B, 3-C, 4-A | (d) 1-C, 2-E, 3-B, 4-D                |

2.19 Absorption frequency ( $\text{cm}^{-1}$ ) in IR spectroscopy for carbonyl group are given in A to E match them

- |  |                        |
|--|------------------------|
| 1. $-\text{COCl}$  | A. 1720                |
| 2. $\begin{array}{c} \text{O} \\    \\ -\text{O}-\text{C} \end{array}$ | B. 1735                |
| 3. $-\text{CHO}$   | C. 1750                |
| 4. $-\text{CONH}_2$  | D. 1776                |
|  | E. 1812                |
| (a) 1-B, 2-A, 3-D, 4-C   | (b) 1-A, 2-B, 3-C, 4-D |
| (c) 1-D, 2-E, 3-B, 4-A   | (d) 1-C, 2-E, 3-B, 4-D |

2.20 Following are the prefixes used in nomenclature which signifies as indicated from A to E. match them

- |          |   |
|----------|---|
| 1. Levo  | A. not all the same atom                        |
| 2. Ortho | B. Rotate the plain polarized light to the left |
| 3. Poly  | C. Made up of many group                        |

4. Hetero

D. Signifies the 1,2 position in benzene ring

E. Three -configuration

(a) 1-B, 2-A, 3-D, 4-C

(b) 1-A, 2-B, 3-C, 4-D

(c) 1-E, 2-B, 3-C, 4-A

(d) 1-B, 2-D, 3-C, 4-A

## PART - B

**(Marks : 120)**

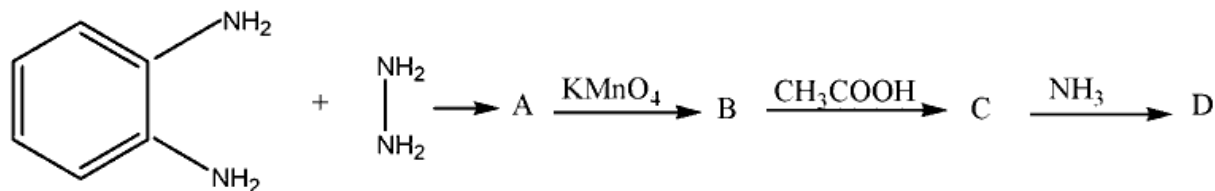
**N.B. 1. Answer any twenty questions.**

**2. If more than 20 questions are attempted, only the first 20 will be considered.**

**3. All questions carry equal marks.**

3. Classify emulsifying agents in accordance with the type of film they form at the interface. Give 2 examples for each
4. Define creaming, inversion, sedimentation – instability of emulsions.  
Give the principle and procedure for the assay of Glycerol trinitrate tablets I.P.
5. (a) What is the source of squill and Indian squill ?  
(b) In what crystalline form does calcium oxalate occur in squill ?  
(c) Give the names of the adulterants of belladonna  
(d) What is the difference between hyoscyamine and atropine ?
6. (a) Give the names of the organisms used in the following biological assay  
1. Diphtheria antitoxin                      2. Gas gangrene antitoxin  
3. Tetanus Antitoxin                      4. Typhoid vaccine  
(b) What is 'sham test' in pyrogen testing ?
7. What is the importance of deaeration in capsulation ? How is it achieved ?
8. Classify neuromuscular blocking agents according to their mechanism of action
9. (a) What is the source of caffeine ?  
(b) What is its chemical name ?  
(c) What happens when caffeine is treated with chlorine and the resulting compound is treated with methanolic NaOH, product obtained is further boiled with dilute HCl ? Give equations.
10. Explain why ranitidine, an  $H_2$  receptor antagonist is more active and more selective than cimetidine
11. (a) Define  
1. Palisade ratio  
2. Stomatal number  
3. Stomatal index  
(b) 80 is the number of stomata per unit area. Ordinary epidermal cells present in the area. Calculate the stomatal index

12. (a) Outline the assay of ephedrine Hydrochloride I.P.  
 (b) Define standard preparation and units of activity in microbial assays of antibiotic.
13. Synthesis of pyrazinamide is outlined below. Write the structure for A, B, C and D



14. (a) Mention the important constitution and source of the following  
 1. Beeswax                                      2. Spermaceti                                      3. Wool alcohol  
 (b) Give the specific method for Keller –Killani test. Which of the component in the respective plant drug is detected by this test ?
15. Which factor alter insulin requirements ?
16. (a) What is an 'ideal' antimalarial drug ?  
 (b) What are the four different ways by which antimalarial drug exert their action ?
17. (a) Name the different components of the aerosol package  
 (b) What are different objectives behind coating of tablets
18. Give the structural activity relationship of the following drug  
 (a) Promethazine                      (b) Chorpromazine                      (c) Thioridazine                      (d) Trifluoperazine
19. What is role of plastisizers in tablet coating ? <http://www.xamstudy.com>
20. Define pM indicators. Name the important pM indicators.
21. Give synthesis of the following drugs.  
 (a) Meprobamate                      (b) Metronidazole                      (c) Chorpheniramine
22. What are different method of locating end point in potentiometric titrations ?
23. (a) Define:  
 1. Hypotonic                      2. Hypertonic                      3. Isotonic  
 (b) Calculate the amount of sodium chloride required to made 100 ml. of a 2% solution of the given local anaesthetic isotonic with blood serum. Molecular wt of local anaesthetic = 339.5, Molar concentration of Blood = 0.030.
24. (a) What is drug regimen in combination therapy of leprosy ?  
 (b) Why chemotherapy leprosy is hampered ?
25. Give reasons for the following :  
 (a) In the determination of Ca<sup>++</sup> ions by complexometry using Erichrome black T asindicated a little magnesium EDTA is added  
 (b) Tetrabutyl ammonium hydroxide is the preferred titration in the titration of acidic substance by nonaqueous method.

(c) Ammonia and EDTA forms complexes with metal ions like  $\text{Cu}^{2+}$ ,  $\text{Ag}^+$  but ammonia is not used as a titrant in complexometry.

26. Write the merits and demerits of anabolic steroids. Mention the names of two official preparations.

27. What happens when ?, Give equations

(a) Sodium salt of toluene p- sulphonamide is condensed with n-butyl isocyanate.

(b) Benzhydryl bromide is treated with 2-dimethyl amino ethanol in presence of alkali.

(c) m-nitrobenzaldehyde is treated with butyric anhydride, the resulting compound is reduced and iodinated.

**End of paper**

**ANSWER KEY GATE 1990**

**Section - A**

1	c	11	d	21	a	31	c
2	a	12	a	22	c	32	b
3	b	13	b	23	d	33	a
4	b	14	c	24	c	34	c
5	d	15	b	25	b	35	d
6	a	16	c	26	d	36	a
7	c	17	d	27	a	37	b
8	a	18	b	28	a	38	b
9	c	19	a	29	a	39	b
10	a	20	d	30	b	40	b

**Section - B**

2.1	b	2.2	c	2.3	d	2.4	a
2.5	a	2.6	c	2.7	b	2.8	c
2.9	d	2.10	a	2.11	d	2.12	b
2.13	c	2.14	c	2.15	d	2.16	c
2.17	a	2.18	a	2.19	c	2.20	d

# GPAT QUESTION PAPER 1989 WITH ANSWER KEY

## PY- PHARMACEUTICAL SCIENCES

Time : 3 hours

Maximum Marks : 200

- N. B.
1. This question paper contains two parts A and B.
  2. Answer all the question from part A.
  3. Answer Any 20 Question from part B.

### PART - A

- N. B.
1. There are 2 sections in this part
  2. Answer all the question in both sections – 1 and 2.
  3. Answer should be given serial order in the answer book.
  4. Do not skip question while writing the answers.
  5. Write the question number and show your answer by writing the alphabet (against the No.) in Capital letters.
  6. In section 1 each question carriers 1-Marks.
  7. In section 2 each question carries 2-marks.
  8. A model is shown at the beginning of each section in part A.
  9. Answer to the question in this part must be Witten in the first three pages only.

### SECTION - I

## CHOOSE THE CORRECT ANSWER

### Model Question

1. Repeated administration of Tyramine results in its decreasing effectiveness:  
(a) Gets detoxicated easily  
(b) Displaces nor-adrenaline from nerve ending binding site  
(c) Displaces adrenaline from nerve ending binding site  
(d) None of the above
2. Atropine on hydrolysis with Barium hydroxide gives:  
(a) Tropanol and Tropic acid  
(b) Scopine and Tropic acid  
(c) Ecgonine and Benzoic acid  
(d) Benzyl Ecgonine and Methanol
3. The concentration of sucrose in simple Syrup BP is:  
(a) 85% w/w  
(b) 60.70% w/w  
(c) 66.70% w/w  
(d) 40.74% w/w
4. Stratified cork and forked are the characteristic diagnostic features of:  
(a) Apocynaceae  
(b) Scrophularaceae  
(c) Gentianaceae  
(d) Polygonaceae



5. Most accepted mechanism for developing bacterial resistance to sulphonamides is:
  - (a) An increasing capacity to inactivate or destroy the drug
  - (b) An alternative metabolic pathway for synthesis of an essential metabolite
  - (c) An increasing product of drug antagonist
  - (d) An alternation in enzyme that utilize PABA
6. C 17  $\alpha$ - $\beta$  unsaturated lactone ring is a common feature in:
  - (a) Digitalis and squill glycosides
  - (b) Digitalis and strophanthus glycosides
  - (c) Digitalis and Senna glycosides
  - (d) Digitalis and Amygdalin
7. For drying blood plasma the following technique is used:
  - (a) Spray drying
  - (b) Freeze drying
  - (c) Vacuum drying
  - (d) Fluid bed drying
8. C3 O-glycoside digitoxin is used for:
  - (a) Cardiac action
  - (b) Hypotensive action
  - (c) Precipitating steroids from solution
  - (d) Precipitating Anthraquinone glycosides
9. Chemical name of amoxicillin is:
  - (a) 6 - [D-(-)  $\alpha$  - amino p-hydroxyacetamido] penicillanic acid
  - (b) 4 - [D-(-)  $\alpha$  - amino p-hydroxyacetamido] penicillanic acid
  - (c)  $\beta$  - [Hydroxy analogue of Benzyl penicillin
  - (d)  $\alpha$  - Carboxy benzyl penicillin
10. The HLB value of sodium lauryl sulphate is:
  - (a) 6.5
  - (b) 13.8
  - (c) 25.0
  - (d) 40.0
11. *Claviceps purpurea* yields after infecting ovaries of Gramineous plants:
  - (a) Digitoxin
  - (b) Lysergic acid derivatives
  - (c) Reserpine
  - (d) Polypeptides
12. In the official bioassay of Erythromycin strain used is:
  - (a) *Bacillus subtilis*
  - (b) *Micrococcus luteus*
  - (c) *Salmonella typhi*
  - (d) *Escherichia coli*
13. The disintegration time for sugar coated tablet is
  - (a) 30 minutes
  - (b) 45 minutes
  - (c) 60 minutes
  - (d) 75 minutes
14. Idioblasts of crystal layer of calcium oxalate is a diagnostic feature of
  - (a) *Hyoscyamus Niger* leaves
  - (b) Deadly nightshade leaves
  - (c) Cinchona bark
  - (d) Senna leaves
15. Antibiotic which interacts with calcium ion is:
  - (a) Erythromycin
  - (b) Streptomycin
  - (c) Tetracycline
  - (d) Ampicillin
16. Flow rate of granules from the hopper can be improved by adding;
  - (a) Disintegrant
  - (b) Glidant
  - (c) Binder
  - (d) Lubricant
17. Silicon carbide rod heated to a high temperature is used as a;
  - (a) Detector in infra red spectroscope
  - (b) Source of light in infra re spectroscope
  - (c) Source of light fluorimetry
  - (d) Detector in gas chromatography

18. Anomocytic type stomata are found in the leaves of:
- (a) Fox glove (b) Urtica dioica  
(c) Cassia acutifolia (d) Atropa belladonna
19. Liver microsomal enzymes are stimulated (enzymic induction) by:
- (a) Cimetidine (b) Phenobarbitone (c) Procaine (d) Adrenaline
20. Enteric coating is achieved by using:
- (a) Hydroxy propyl methyl cellulose (b) Carboxy methyl cellulose  
(c) Cellulose acetate Phthalate (d) Povidone
21. Car price reaction is applied for the photometric evaluation of:
- (a) Vitamin A (b) Tocopherol  
(c) Nandrolone Phenyl Propionate (d) Benzodiazepine
22. Peroxide enzyme present in acacia is identified by:
- (a) Borntragers test (b) Molisch's test  
(c) Oxidation and extraction in Benzene (d) Oxidation and treatment with Benzididine
23. Prostaglandins are a group of related:
- (a) Alcohols (b) Aldehydes (c) Fatty acid (d) Alkaloids
24. Licence to sell drug specified in schedule C and C1 is given from number
- (a) -19 (b) -18 (c) -21 (d) -24
25. Liquide paraffin exhibits:
- (a) Plastic flow (b) Newtonian flow  
(c) Pseudoplastic flow (d) Dilatant flow
26. Estrogenic and Progestrogenic combination mainly:
- (a) Inhibits the ovulation (b) Inhibits the implantation of the fertilized ovum  
(c) Inhibits the fertilization of ovum (d) Inhibits development of endometrium
27. More of earthy matter in a Rhizome is determine by:
- (a) Total ash value  
(b) The earthy material is separated and then weighed  
(c) The Rhizome is washed in water and the in hydrochloric acid finally it is weighed  
(d) Acid insoluble ash value
28. Lidocaine is synthesized from:
- (a) 2 : 6-dimethyl-5-amino methyl benzene (b) 2 : 6-dimethyl-5-nitro methyl benzene  
(c) 2 : 6-xylidene (d) 2-methyl-6-ethyl-5-amino methyl benzene
29. Sterilization temperature for aqueous solution in autoclave (Moist heat) is:
- (a) 72°C (b) 121 °C (c) 147 °C (d) 160 °C
30. Following combination is suggested in the treatment of Leprosy:
- (a) Dapsone + Ampicinllin + Clofazimine (b) Dapsone + Clofazimine + Rifampin  
(c) Dapsone + Erythromycin + Rifampin (d) Dapsone + Teracycline + Streptomycine

31. The gummy nature *Astragalus gummifer* is depend on:  
 (a) More of Methoxly group of Bassorin (b) The carbohydrate content  
 (c) More of hydroxyl groups of the sugar moiety (d) More of protein contain of the drug
32. The vitamin administered with isoniazid to minimize its adverse reaction is  
 (a) Vitamin A (b) Pyridoxine (c) Biotin (d) Pantothenic acid
33. For the synthesis of Nitrofurantoin which one of the following combination of chemicals are used:  
 (a) 5-Nitro 2-furaldehyde and 2-amino hydantoin (b) 5-Nitro 2-furaldehyde and hydantoin  
 (c) 5-amino 2-furaldehyde and 2-amino hydantoin (d) 5-Nitro 2-furaldehyde and barbituric acid
34. To get the optimum optical density of the solution for 1 cm thick layer the concentration should be about  
 (a)  $10^{-4}$  mole/lit (b)  $10^{-7}$  mole/lit (c) 0.1 gm/lit (d) 0.5 gm/lit
35. The sugar moiety of *Digitails purpurea* is:  
 (a) 2 : 6-deoxy alloose (b) 2 : 6-dedoxy glucose  
 (c) 2 : 6-deoxy Rhamnose (d) 2 : 6-deoxy galactose
36. Additional of sodium chloride to sodium Oleate emulsion will:  
 (a) Stabilize emulsion (b) Destabilize emulsion  
 (c) Decrease the globule size of the emulsion (d) None of the above
37. Anti hypertensive drug inhibits the rennin angiotensin system is:  
 (a) Reserpine (b) Captopril (c) Methyl dopa (d) Propranalol
38. Acidity of Ascorbic acid is due to the presence of:  
 (a) Free carboxylic acid (b) A number of hydroxyl group  
 (c) Enolic groups (d) None of the above
39. Progesterone injection BP is a sterile solution in:  
 (a) Water (b) Ethyl oleate (c) Propylene glycol (d) Glycerol
40. Thiamine on treatment with sodium sulfite solution and sulfur dioxide yields:  
 (a) Pyrimidine and a thiazole derivative <http://www.xamstudy.com>  
 (b) Pyridine and thiazole derivative  
 (c) 2 : 3: 4-Thihydropyridine and Thiophene derivatives  
 (d) Pyrimidine and Thiophene derivatives.

## SECTION - II

### MATCH THE FOLLOWING

- 2.1. Identify the correct skeleton ring present in the following compounds from the ring system listed from A to E.
- |               |                                       |
|---------------|---------------------------------------|
| 1. Riboflavin | (A) Perhydro cyclopentanophenanthrene |
| 2. Estrone    | (B) 1 : 8 Naphthyridine               |

- |                        |                        |
|------------------------|------------------------|
| 3. Indomethacin        | (C) Indole             |
| 4. Nalidixic acid      | (D) Quinolin           |
|                        | (E) Isoalloxazine      |
| (a) 1-E, 2-A, 3-C, 4-D | (b) 1-D, 2-C, 3-B, 4-A |
| (c) 1-B, 2-C, 3-A, 4-D | (d) 1-D, 2-A, 3-C, 4-B |

2.2. Chosse the instrument or apparatus listed from A to E study the following:

- |                                |                        |
|--------------------------------|------------------------|
| 1. Rheology of semi solids     | (A) Andreasen Pipette  |
| 2. Hardness of tablets         | (B) Monasanto tester   |
| 3. Particle size in suspension | (C) Ultrasonifier      |
| 4. Homogenization of emulsion  | (D) Viscometer         |
|                                | (E) Zeta meter         |
| (a) 1-D, 2-B, 3-C, 4-A         | (b) 1-E, 2-B, 3-A, 4-C |
| (c) 1-D, 2-C, 3-A, 4-B         | (d) 1-C, 2-B, 3-D, 4-A |

2.3. Given below are some microscopical diagnostic of the drug listed in A to E. Chosse the appropriate one.

- |   |                        |
|---|------------------------|
| 1. Unlignified septate fiber                        | (A) Rhubarb            |
| 2. Raphides of calcium oxalate embedded in mucilage | (B) Solanaceous plant  |
| 3. Anisocytic type of stomata                       | (C) Ginger             |
| 4. Star spots                                       | (D) Squill             |
|   | (E) Solanaceous plants |
| (a) 1-A, 2-B, 3-C, 4-D                              | (b) 1-D, 2-C, 3-B, 4-A |
| (c) 1-B, 2-C, 3-A, 4-D                              | (d) 1-A, 2-D, 3-E, 4-A |

2.4. Chosse the most appropriate drug for the following

- |                                 |                        |
|---------------------------------|------------------------|
| 1. Potassium-sparing diuretic   | (A) Spiranolactone     |
| 2. Loop diuretic                | (B) Mannitol           |
| 3. Osmotic diuretic             | (C) Furosemide         |
| 4. Carbonic anhydrase inhibitor | (D) Acetazolamide      |
|                                 | (E) Aldosterone        |
| (a) 1-A, 2-C, 3-E, 4-D          | (b) 1-A, 2-B, 3-C, 4-D |
| (c) 1-A, 2-C, 3-D, 4-B          | (d) 1-C, 2-B, 3-D, 4-A |

2.5. Transmitted colour corresponds to various wave length ranges as listed under A to E. Chosse the correct wave length for the colour:

- |                        |                        |
|------------------------|------------------------|
| 1. Green               | (A) 635-700            |
| 2. Orange              | (B) 520-560            |
| 3. Yellow              | (C) 560-590            |
| 4. Red                 | (D) 590-635            |
|                        | (E) 650-780            |
| (a) 1-A, 2-B, 3-C, 4-D | (b) 1-B, 2-C, 3-A, 4-D |
| (c) 1-B, 2-D, 3-C, 4-E | (d) 1-B, 2-C, 3-D, 4-A |

2.6. Given below equipment used in the manufacture of the following product A to E. Match them correctly.

- |                        |                        |
|------------------------|------------------------|
| 1. Zanasi              | (A) Tablet granules    |
| 2. HEPA Filter         | (B) Tablet coating     |
| 3. Chilsonator         | (C) Emulsion           |
| 4. Accela cota         | (D) Injectable         |
|                        | (E) Capsules           |
| (a) 1-D, 2-A, 3-C, 4-B | (b) 1-E, 2-D, 3-A, 4-B |
| (c) 1-B, 2-C, 3-A, 4-D | (d) 1-C, 2-B, 3-D, 4-A |

2.7. Match the following with the schedules listed in A to E correctly.

- |  |                        |
|--|------------------------|
| 1. Requirements of factory premises                                | (A) P                  |
| 2. Standards for disinfectant fluids                               | (B) V                  |
| 3. Life period of drugs  | (C) N                  |
| 4. List of minimum equipment for the efficient running of Pharmacy | (D) O                  |
|  | (E) M                  |
| (a) 1-E, 2-D, 3-A, 4-C   | (b) 1-B, 2-C, 3-D, 4-A |
| (c) 1-B, 2-C, 3-A, 4-D   | (d) 1-C, 2-B, 3-D, 4-A |

2.8. Following are the reaction/tests observed in case of drugs listed in A to E. Match them correctly.

- |  |                          |
|--|--------------------------|
| 1. When fixed oil is exposed to U.V. rays, blue          | (A) Digoxin              |
| 2. On oxidation with $\text{KMnO}_4$ , Benzaldehyde      | (B) Benzoin              |
| 3. With ammoniacal Quaxom characteristic ballooned       | (C) Cinchona             |
| 4. Bark powder exhibits fluorescence with sulphuric acid | (D) Palmolein            |
|  | (E) Gossypium barbadance |
| (a) 1-A, 2-B, 3-C, 4-D                                   | (b) 1-D, 2-B, 3-E, 4-C   |
| (c) 1-B, 2-C, 3-A, 4-D                                   | (d) 1-C, 2-B, 3-D, 4-A   |

2.9. Mechanism of Antitubercular action of the drug listed are indicate are in A to E. Choose the most appropriate one.

- |                        |   |
|------------------------|---|
| 1. Ethambutol          | (A) Prevents the synthesis of protein and DNA and reduces R.N.A. synthesis. |
| 2. P. A. S.            | (B) Interferes with several of protein synthesis                            |
| 3. Cycloserine         | (C) Competitive inhibiton   |
| 4. Ethionamide         | (D) Inhibits peptide synthesis in Mycobacteria                              |
|                        | (E) Inhibits DNA directed RNA Synthesis                                     |
| (a) 1-A, 2-B, 3-C, 4-D | (b) 1-D, 2-A, 3-C, 4-B  |
| (c) 1-B, 2-C, 3-A, 4-D | (d) 1-D, 2-C, 3-B, 4-A  |



2.10. Given below are the receptor and their antagonist (A to E). Match them correctly.

- |                                      |                        |
|--------------------------------------|------------------------|
| 1. Histamine H <sub>2</sub> Receptor | (A) Atropine           |
| 2. Muscarinic Receptor               | (B) Ranitidine         |
| 3. Adrenaline α receptor             | (C) Pentolamine        |
| 4. Adrenaline α receptor             | (D) Metaraminol        |
|                                      | (E) Metoprolol         |
| (a) 1-B, 2-A, 3-C, 4-E               | (b) 1-D, 2-C, 3-B, 4-A |
| (c) 1-B, 2-C, 3-A, 4-D               | (d) 1-C, 2-B, 3-D, 4-A |

2.11. Match the following regions in GIT with the pH levels indicated from A to E.

- |                        |                        |
|------------------------|------------------------|
| 1. Mouth               | (A) = 5.0 – 6.0        |
| 2. Stomach             | (B) = 6.8 – 7.5        |
| 3. Deodenum            | (C) = 6.8 – 7.0        |
| 4. Large intestine     | (D) = 3.0 – 5.0        |
|                        | (E) = 1.5 – 3.0        |
| (a) 1-A, 2-D, 3-B, 4-C | (b) 1-A, 2-D, 3-B, 4-A |
| (c) 1-B, 2-E, 3-D, 4-C | (D) 1-C, 2-B, 3-D, 4-A |

2.12. Listed in A to E are some of the analytical constants. Match them correctly with the drugs given below.

- |   |                        |
|---|------------------------|
| 1. A Leafy drug   | (A) Total ash value    |
| 2. A Bark   | (B) Cineole content    |
| 3. Eucalyptus oil   | (C) Fibre length       |
| 4. A fixed oil having more of unsaturated fatty acid glycerides | (D) Iodine value       |
|   | (E) Stomatal index     |
| (a) 1-A, 2-B, 3-C, 4-D  | (b) 1-D, 2-C, 3-B, 4-A |
| (c) 1-E, 2-C, 3-B, 4-D  | (d) 1-C, 2-B, 3-D, 4-A |

2.13. Match the ingredients listed A to E with the purpose for which they are used in the formulations.

- |                        |                        |
|------------------------|------------------------|
| 1. Film coating        | (A) Sodium benzoate    |
| 2. Syrups              | (B) Ethyl cellulose    |
| 3. Emulsification      | (C) Eudragit           |
| 4. Enteric coating     | (D) Sucrose            |
|                        | (E) Sodium oleate      |
| (a) 1-B, 2-D, 3-A, 4-C | (b) 1-C, 2-D, 3-E, 4-B |
| (c) 1-B, 2-C, 3-A, 4-D | (d) 1-C, 2-B, 3-D, 4-A |

2.14. Match the biological listed under A to E for the following compounds:

- |  |  |
|--|--|
| 1. 1 : 3-Propanediol, 2-methyl 2-propyl Carbamate      | (A) Antimalarial   |
| 2. 2 Chloro-10[3-(dimethylamino) propyl] Phenothiazine | (B) Bactericidal to anaerobic and Microerophilic organisms |
| 3. 5 Nitro-2-furaldehyde semicarbazone                 | (C) Antibacterial  |
| 4. 2 Methyl-5-Nitro Imidazole -ethanol                 | (D) Relief of anxiety and tension                          |
|  | (E) Tranquilizer   |



- (a) 1-A, 2-B, 3-C, 4-D  
 (c) 1-B, 2-C, 3-A, 4-D

- (b) 1-D, 2-A, 3-C, 4-B  
 (d) 1-E, 2-E, 3-D, 4-C

2.15. Given below are the drug A to E and the ailments for which they are recommended. Match them correctly.

- |                      |   |
|----------------------|---|
| 1. Parkinsonism      | (A) Methyl dopa                           |
| 2. Hypertension      | (B) Levodopa with decarboxylase inhibitor |
| 3. Nasal congestion  | (C) Neostigmine                           |
| 4. Myasthenia gravis | (D) Phenyl Propanolmine                   |
|                      | (E) Ibuprofen                             |

- (a) 1-A, 2-B, 3-C, 4-D  
 (c) 1-B, 2-C, 3-A, 4-D
- (b) 1-B, 2-A, 3-D, 4-C  
 (d) 1-C, 2-B, 3-D, 4-A

2.16. Given below are some of the drugs and their mode action in A to E. Match them correctly.

- |                  |  |
|------------------|--|
| 1. Hydralazine   | (A) Vasodilator by direct action                           |
| 2. Phenothiazine | (B) Inhibits the Vasoconstrictor and presor effect of 5 HT |
| 3. Methysergide  | (C) Antagonist D2 receptor of Dopamine                     |
| 4. Tolazamide    | (D) Stimulate the islet tissue to secrete insulin          |
|                  | (E) Inhibiting the enzyme carbonic anhydrase               |

- (a) 1-A, 2-B, 3-C, 4-D  
 (c) 1-B, 2-C, 3-A, 4-D
- (b) 1-D, 2-C, 3-B, 4-A  
 (d) 1-A, 2-C, 3-B, 4-D

2.17. Given below in A to E are the names of drugs. Appropriate tests are given below for drugs. Match them correctly.

- |  |                             |
|--|-----------------------------|
| 1. Alcoholic solution of $\alpha$ -naphthol and sulphuric acid | (A) Atropine                |
| 2. Murexide test   | (B) Reserpine               |
| 3. Para-dimethylamino Benzaldehyde                             | (C) Caffeine                |
| 4. Ninhydrine  | (D) Gelatin                 |
|  | (E) Triticum sativum powder |

- (a) 1-A, 2-B, 3-C, 4-D  
 (c) 1-E, 2-C, 3-A, 4-D
- (b) 1-D, 2-C, 3-B, 4-A  
 (d) 1-C, 2-B, 3-D, 4-A

2.18. Given below in A to E are the names of instruments used for the determination of the following. Match them correctly

- |                                 |                                      |
|---------------------------------|--------------------------------------|
| 1. Particle volume              | (A) Clarity apparatus                |
| 2. Presence of Foreign particle | (B) Du Nouy ring                     |
| 3. Surface tension              | (C) Coulter counter                  |
| 4. Presence of polymorph        | (D) Compactor                        |
|                                 | (E) Differential thermal calorimeter |

- (a) 1-C, 2-A, 3-B, 4-E  
 (c) 1-B, 2-C, 3-A, 4-D
- (b) 1-D, 2-C, 3-B, 4-A  
 (d) 1-C, 2-B, 3-D, 4-A

2.19. Chosse the correct starting material listed from A to E for the synthesis of the following drugs.

- |                        |                        |
|------------------------|------------------------|
| 1. Cortisone           | (A) Diosgenin          |
| 2. Progesterone        | (B) $\beta$ -ionone    |
| 3. Testosterone        | (C) Spirostanol        |
| 4. Vitamin A           | (D) Sarmentogenin      |
|                        | (E) Anthracin          |
| (a) 1-A, 2-B, 3-C, 4-D | (b) 1-D, 2-C, 3-B, 4-A |
| (c) 1-B, 2-C, 3-A, 4-D | (d) 1-C, 2-A, 3-A, 4-B |

2.20. Given below are the types of ointment bases. Match them with the correct ointments in A to E.

- |                        |                          |
|------------------------|--------------------------|
| 1. Absorption base     | (A) Emulsifying ointmen  |
| 2. Oleogenous base     | (B) Hydrophilic ointment |
| 3. Emulsion base       | (C) Oily cream           |
| 4. Water soluble base  | (D) Kaolin poultice      |
|                        | (E) Simple ointment      |
| (a) 1-A, 2-B, 3-C, 4-D | (b) 1-D, 2-A, 3-C, 4-B   |
| (c) 1-B, 2-E, 3-C, 4-A | (d) 1-C, 2-B, 3-D, 4-A   |

## PART - B

**N.B. :** *Answer any twenty questions*

*If more than 20 questions are attempted only the first 20 will be considered.*

*Answer should not exceed 15 lines*

*All Question carry equal marks.*

- Write the structure of the following indicating to what pharmacological category they belong
  - [1-dimethylamino-3-(4-Chlorophenyl 3,2-Pyridyl) Propane]
  2. Hydroxy methylene-17  $\beta$  hydroxy -17-methyl 5  $\alpha$ -androstan 3-one
  - 2, 4-diamino-5-(3, 4, 5-trimethoxy phenyl) methyl pyridine.
- What is a barrier-layer cell ?
  - What are the different ways by which a molecule can absorb energy
- Explain briefly the improved artificial method for producing Sclerotium.
- Give the characteristics of the ideal preservative for Pharmaceutical preparation.
- Give the principal of official assay of INH. Given Equations for the reactions involved.
- Give the exact mode action of the following drugs:
  - Dicoumarol
  - Vinblastin
  - Valprolic acid

9. Give the mode of action of the following anti arrhythmic drugs:
  - (a) Procainamide
  - (b) Propranolol
  - (c) Verapamil
10. Mention the various factors governing transdermal absorption of drugs.
11. (a) What is Hoffmann's exhaustive Methylation ?  
 (b) Show the complete step of reactions when Isoquinoline is subjected to Hoffmann's exhaustive Methylation.
12. How the solid samples are prepared for the measurement of IR Absorption spectra? Why such a process is adopted
13. Name the various Insulin injections which are official in IP. Mention time onset and duration of action.
14. Give the names of the drugs, their source. And one chemical test for identification of any one important constituent in each of the following.
  - (a) Drug obtained as latex after incisions on capsule.
  - (b) Dried juice obtained from the leaves of plant belonging to Liliaceae family.
  - (c) A seed having action on heart
15. Enumerate the problems associated with use of plastic as a material for packaging Pharmaceuticals.
16. With the help of IR absorption readings how you can distinguish the following pairs of compounds. Predict the bands and interpret <http://www.xamstudy.com>
17. Define the following:
 

(a) Liposome	(b) Polymorphism	(c) Prodrug
--------------	------------------	-------------
18. Name the various methods in the preparation of micro capsules and give only the process involved in the Coacervation phase separation technique.
19. Give the mode of action of following antibiotics:
  - (a) Ampicillin
  - (b) Tetracycline
  - (c) Erythromycin
20. What are the possible adulterants of fox glove leaves? How are they detected?
21. List the physicochemical factors affecting drug absorption.
22. Write the equation for the following synthesis:  
 O-Chloro benzoic acid is condensed with 2, 3 Xylidine with the aid of Potassium carbonate and the resulting Potassium salt is treated with mineral acid.

23. Give the possible Drug/Drug interaction of the following combination:
- Penicillin with probenecid
  - Lithium carbonate with Chlorthiazide
  - Levodopa with pyridoxine
24. (a) What concentration of Dextrose will be used for the preparation of 100ml of Dextrose solution isotonic with blood serum. Molecular weight of Dextrose = 180
- (b) In what proportion 80% and 30% alcohol mixed to obtain 50% alcohol
25. Give the structure and specification relationship in the following compounds:
- Phenobarbital
  - Amobarbital
  - Cyclobarbital
  - Pentobarbital
26. (a) An alkaloid gave  $E_{1\%}^{1\text{cm}}$  at 310 nm = 180. The Extinction of 0.003% solution in water at 310 nm was found 0.500 (1 cm cell). Calculate the percentage of alkaloid
- (b) Find the HLB value of a center which has Saponification number 40.5 and acid number of the fatty acid 260.0
27. Name the endogenous neurohormones and give their structure.

**End of paper**

**ANSWER KEY GATE 1989**

**Section - I**

1 - c	2 - b	3 - c	4 - a	5 - d	6 - b	7 - b	8 - a	9 - b	10 - d
11 - b	12 - b	13 - c	14 - c	15 - b	16 - b	17 - b	18 - a	19 - b	20 - c
21 - a	22 - d	23 - c	24 - c	25 - c	26 - a	27 - d	28 - c	29 - b	30 - b
31 - a	32 - b	33 - a	34 - c	35 - b	36 - b	37 - b	38 - a	39 - b	40 - a

**Section - II**

2.1 - a	2.2 - b	2.3 - d	2.4 - a	2.5 - c	2.6 - b	2.7 - a	2.8 - b	2.9 - d
2.10 - a	2.11 - c	2.12 - c	2.13 - b	2.14 - d	2.15 - b	2.16 - d	2.17 - c	2.18 - a
2.19 - d	2.20 - c							

# GPAT QUESTION PAPER 1988 WITH ANSWER KEY

## PY-PHARMACEUTICAL SCIENCES

Time : 3 hours

Maximum Marks : 200

- N. B.
1. *This question paper contains two parts A and B.*
  2. *Answer all the question from part A.*
  3. *Answer Any 20 Question from part B.*

### PART - A

- N. B.
1. *There are 2 sections in this part*
  2. *Answer all the question in both sections - 1 and 2.*
  3. *Answer should be given serial order in the answer book.*
  4. *Do not skip question while writing the answers.*
  5. *Write the question number and show your answer by writing the alphabet (against the No.) in Capital letters.*
  6. *In section 1 each question carriers 1-Marks.*
  7. *In section 2 each question carries 2-marks.*
  8. *A model is shown at the beginning of each section in part A.*
  9. *Answer to the question in this part must be Witten in the first three pages only.*

### SECTION - I

## CHOOSE THE CORRECT ANSWER

### Model Question

1. To understand the drug receptor interaction is necessary to quantify the relation between  
(a) Drug and its toxicity (b) Drug and its absorption  
(c) Drug and its biological effect (d) Drug and intermediate product
2. Penicillinase resistance penicillin is-  
(a) Amoxycillin (b) Amipicillin (c) Penicillin V (d) Methicillin
3. Morphine is present in -  
(a) *Atropa belladona* (b) *Papaver somniferum*  
(c) *Ricinus communis* (d) *Solanum nigrum*
4. Ion exchange chromatography is the method of choice for separation of -  
(a) Metals (b) Sugar (c) Fatty acid (d) Sterols
5. Rideal Walker test is performed by using the strain -  
(a) *Escherichia coli* (b) *Straphylococcus neruri*  
(c) *Straphylococcus pyrogenes* (d) *Salmonella typhii*

6. Pheniramine maleate is an antihistaminic agent belonging to the class-
- (a) Ethylenediamine derivative (b) Cyclic basic class analogs  
(c) Aminoallyl ether analoges (d) None of the above
7. Tetracycline undergo epimerization C-4 between pH 4 and 8 to give -
- (a) Isotetracyclines (b) Epitetracyclines  
(c) Nortetracyclines (d) None of above
8. Tyndalisation means -
- (a) Successive autoclaving with a bactericide  
(b) Successive heating with a bactericide  
(c) Successive heating at low temperature  
(d) Successive autoclaving at low temperature and incubator
9. Morphine and heroin differ from each other in respect of -
- (a) Methyl group on nitrogen (b) Acetyl groups at C<sub>3</sub> and C<sub>6</sub>  
(c) Absence of double bond between C<sub>4</sub> and C<sub>6</sub> (d) Absence of D ring
10. Vincristine and Vinblastine act by -
- (a) Binding with the protein tubulin and arrest at metaphase  
(b) Inhibiting the protein synthesis  
(c) Acting as antimetabolite  
(d) Inhibiting the enzyme system
11. A rhamno-glucoside on complete hydrolysis will give -
- (a) Aglycon + Fructose + Rhamnose (b) Aglycon + Ribose + Rhamnose  
(c) Aglycon + Rhamnose + Glucose (d) Rhamnose + Fructose
12. The technique employed to study the insoluble film at oil water interface is -
- (a) Micellization (b) Deflocculation  
(c) Electrostatic balance (d) Film balance
13. Gray baby syndrome is due to the indiscriminate use of-
- (a) Streptomycin (b) Chloramphenicol  
(c) Penicillin (d) Tetracycline
14. N,N dimethyl -(1-methyl-1-oxo-3,3-diphenylhexyl) ammonium chloride is the chemical -
- (a) Methadone hydrochloride (b) Alpha proline hydrochloride  
(c) Meperidine hydrochloride (d) Darvon
15. Sulphonamide tragedy was due to combination with -
- (a) Penicillin (b) Streptomycin  
(c) Diethylene hydrochloride (d) Bicarbonate
16. In the preparation of tablets, powdered medicaments are mixed by -
- (a) To reduce the total volume (b) To increase adsorption  
(c) To increase adhesiveness (d) To reduce inter particle



17. One nanometer (nm) is equal to –  
 (a)  $10^{10}$ cm                      (b)  $10^{-4}$ cm                      (c)  $10^{-7}$ cm                      (d)  $10^{-8}$  cm
18. Cholinergic receptor present on intestinal muscle is –  
 (a)  $H_2$  receptor                      (b) Muscarinic receptor  
 (c) Nicotinic receptor                      (d) Beta receptor
19. Indicate the correct order of increasing eluent power of benzene, ether, chloroform and ethyl acetate-  
 (a) Chloroform < Benzene < Ethyl acetate < Ether    (b) Benzene < Ether < Chloroform < Ethyl acetate  
 (c) Ether < Chloroform < Ethyl acetate < Benzene    (d) Ethyl acetate < Ether < Benzene < Chloroform
20. Limulus test is rapid in vitro test for parentals to detect the presence of –  
 (a) Particulate matter                      (b) Fungus  
 (c) Pyrogens                      (d) Bacteria
21. An essential requirement of the mobile phase in HPLC is that –  
 (a) It must have constant flow rate with pulses    (b) It must be freshly distilled  
 (c) It must be run at 20°C only                      (d) It must flow with pulses
22. Indian (Tinnevely) and Africa seena leaves differ from other with respect to –  
 (a) Vein islet number                      (b) Stomatal index  
 (c) Colour                      (d) All of the above
23. 3-Etherification of morphine molecules causes –  
 (a) Morphine antagonism                      (b) No change in activity  
 (c) Decrease of analgesic and addiction                      (d) Increase of analgesic and addiction
24. Addition of electrolyte to a lysol may cause –  
 (a) Tyndall effect                      (b) Salting out                      (c) Coagulation                      (d) Dilution
25. Salicin, a phenolic glycoside, on hydrolysis yields –  
 (a) Salicylic alcohol+ Glucose                      (b) Phenol + Glucose  
 (c) Salicyl alcohol + Glucose                      (d) Salicyl aldehyde + Glucose
26. Lignocaine hydrochloride is officially assayed by –  
 (a) Potentiometric titration                      (b) Acid base titration  
 (c) Complexometric titration                      (d) Non aqueous titration
27. In supra ventricle arrhythmia Digoxin when supplemented with \_\_ is dangerous –  
 (a) Quinidine                      (b) Procaine                      (c) Calcium                      (d) Xylocaine
28. Injection of insulin I.P. should be kept at PH between –  
 (a) 5 and 5.5                      (b) 3 and 3.5                      (c) 7 and 7.5                      (d) 9 and 9.5
29. Some adrenocorticoids are referred to as  $\Delta$ -corticoids because of –  
 (a) High amount of unsaturation in the molecules  
 (b) Additional double bond in ring A between carbon 1 and 2  
 (c) Presence of one double bond in each ring  
 (d) Absence of double bond in ring A

30. In radioactive pharmaceuticals half life of compound means –
- The time taken for one half of the compound to bind with serum albumin
  - The time taken for onset of its action
  - The time taken for the activity to decay to one half of its initial value
  - The time taken for its complete metabolism
31. Wagner's test is used to detect the presence of –
- Steroids
  - Alkaloids
  - Glycoside
  - Terpenes
32. Metronidazole inhibits anaerobic bacteria and protozoa by –
- Affecting the structure of DNA molecule of the organism
  - Destroying the ribosome
  - Inhibiting the cytochrome system
  - Inhibiting the protein synthesis
33. Most common oestrogen progesterone preparation used as oral contraceptive agent contains –
- Methanol + Progesterone
  - Estrone + Progesterone
  - Diethyl stillbestrol + Norgestrol
  - Ethinylloestradiol + Norethindrone
34. Before washing the ampoules the mouth of each ampoule is rotated in Bunsen flame to melt down the rough edge. This process is called as –
- Flaming
  - Charging
  - Annacaling
  - Grounding
35. In Benzothiadiazides reduction of the double bond between the position 3 and 4 gives rise to –
- Decreased diuretic activity
  - Increase the diuretic activity
  - No diuretic activity
  - No change in diuretic activity
36. Peripheral neurotransmitter is - <http://www.xamstudy.com>
- Histamine
  - Noradrenaline
  - Hydroxytryptamine
  - Prostaglandin
37. Beer's laws state that –
- Absorbance of a solution is indirectly proportional to the absorbing solute
  - Absorbance of a solution is indirectly proportional to the length of cell
  - Absorbance of a solution is directly proportional to the absorbing solute
  - Transmittance of a solution is directly proportional to the absorbance solvent

## SECTION - II

### MATCH THE FOLLOWING

- 2.1. Given below are the hypertensive agents. Match their mode of action (A to E)
- |                       |   |
|-----------------------|---|
| (1) Minoxidil         | (A) Alpha adrenoceptor antagonist               |
| (2) Parazosin         | (B) Beta adrenoceptor antagonist                |
| (3) Alpha methyl dopa | (C) From alpha methyl norepinephrine            |
| (4) Clonidine         | (D) Direct action on blood vessel               |
|                       | (E) Decrease sympathetic activity through brain |

(a) 1-A, 2-B, 3-D, 4-C

(c) 1-E, 2-B, 3-D, 4-C

(b) 1-D, 2-A, 3-C, 4-E

(d) 1-A, 2-E, 3-B, 4-D

2.2. Indicate the from the group A to E the correct compound for the given source -

(1) *Urginea maritima*

(2) *Rheum palmatum*

(3) *Myristica fragrans*

(4) *Claviceps purpurea*

(A) Camphene

(B) Scilliroside

(C) Emodine

(D) Atropine

(E) Ergometrine

(a) 1-B, 2-C, 3-A, 4-E

(c) 1-E, 2-B, 3-D, 4-C

(b) 1-A, 2-B, 3-E, 4-C

(d) 1-A, 2-E, 3-B, 4-D

2.3. Select the appropriate PH range from A to E for the following indication -

(1) Methyl red

(2) Bromothymol blue

(3) Phenolphthalein

(4) Thymol blue

(A) 1.2 - 2.8

(B) 4.2 - 4.6

(C) 4.8 - 5.2

(D) 8.2 - 10.0

(E) 6.0 - 7.6

(a) 1-A, 2-B, 3-D, 4-C

(c) 1-E, 2-B, 3-D, 4-C

(b) 1-A, 2-B, 3-E, 4-C

(d) 1-C, 2-E, 3-D, 4-A

2.4. Given the drug and their schedule A to E .Match the correctly -

(1) B- Complex tablets

(2) Calcium gluconate injection

(3) Small pox vaccine

(4) Ampicillin capsule

(A) Schedule CL

(B) Schedule F

(C) Schedule H

(D) Schedule L

(E) Schedule C

(a) 1-A, 2-B, 3-D, 4-C

(c) 1-E, 2-B, 3-D, 4-C

(b) 1-A, 2-B, 3-E, 4-D

(d) 1-A, 2-E, 3-B, 4-D

2.5. Given below the antibacterial agent and mode of action (A to E) .Match the correctly -

(1) Gentamycin

(2) Isoniazid

(3) Polymyxin B

(4) Penicillin

(A) Inhibit the mycolic acid synthesis

(B) Prevent the bacterial cell wall synthesis

(C) Bind with 30S ribosomal subunit ( take false amino acid )

(D) Get accumulated at cell wall membrane and counteract with cell phospholipids

(E) Destroys the nucleic acid

(a) 1-C, 2-A, 3-D, 4-B

(c) 1-E, 2-B, 3-D, 4-C

(b) 1-A, 2-B, 3-E, 4-C

(d) 1-A, 2-E, 3-B, 4-D

2.6. Match the given ingredients from A to E with the purpose for which it is incorporated in the formulation of tablets –

- |                        |                              |
|------------------------|------------------------------|
| (1) Glidant            | (A) Pre – gellitinsed starch |
| (2) Diluent            | (B) Pyramine                 |
| (3) Adherents          | (C) Colloideal silica        |
| (4) Disintegrant       | (D) Cackium sulphate         |
|                        | (E) Sodium alginate          |
| (a) 1-C, 2-D, 3-A, 4-E | (b) 1-A, 2-B, 3-E, 4-C       |
| (c) 1-E, 2-B, 3-D, 4-C | (d) 1-A, 2-E, 3-B, 4-D       |

2.7. Match the correct structural feature from A to E for the following compounds –

- |                        |                        |
|------------------------|------------------------|
| (1) Pempidine          | (A) Imidazoline ring   |
| (2) Phentolamine       | (B) Piperidine ring    |
| (3) Prosympal          | (C) Indene ring        |
| (4) Sulindac           | (D) 1,4 –Dioxane ring  |
|                        | (E) Indole ring        |
| (a) 1-A, 2-B, 3-D, 4-C | (b) 1-A, 2-B, 3-E, 4-C |
| (c) 1-B, 2-A, 3-D, 4-C | (d) 1-A, 2-E, 3-B, 4-D |

2.8. Given below are the ailments and the drugs used (A) to (E). Match them correctly –

- |                         |                        |
|-------------------------|------------------------|
| (1) Parkinson's disease | (A) Probenicid         |
| (2) Glaucoma            | (B) Ampicillin         |
| (3) Gout                | (C) Nitroglycerin      |
| (4) Angina              | (D) Pilocarpine        |
|                         | (E) Levo dopa          |
| (a) 1-A, 2-B, 3-D, 4-C  | (b) 1-A, 2-B, 3-E, 4-C |
| (c) 1-E, 2-D, 3-A, 4-C  | (d) 1-A, 2-E, 3-B, 4-D |

2.9. Given below are the equipment used in manufacturing powder and their purpose (A to E). Match them correctly

- |                         |                                     |
|-------------------------|-------------------------------------|
| (1) Coulter counter     | (A) To determine the total surface  |
| (2) Sorptometer         | (B) To determine particle size      |
| (3) Andreasen apparatus | (C) To determine the flow rate      |
| (4) Shear box           | (D) To determine sedimentation rate |
|                         | (E) To determine the cohesiveness   |
| (a) 1-A, 2-B, 3-D, 4-C  | (b) 1-A, 2-B, 3-E, 4-C              |
| (c) 1-E, 2-B, 3-D, 4-C  | (d) 1-B, 2-A, 3-D, 4-E              |

2.10. Match the following from A to D –

- |   |   |
|---|---|
| (1) Photocell can be prevented from getting fatigue | (A) By selecting excitation and visible                   |
| (2) Resolving power of grating can be increasing    | (B) By increasing the radiation for minimal possible time |
| (3) Two different colour compound can be analysed   | (C) After separation using binary component system        |

(4)  $\lambda$  – max can be found

(D) By finding the absorbance at each wave length

(a) 1-A, 2-B, 3-D, 4-C

(b) 1-B, 2-A, 3-C, 4-D

(c) 1-A, 2-B, 3-E, 4-C

(d) 1-A, 2-E, 3-B, 4-D

2.11. Choose the appropriate drug from A to E for the following categories –

(1) Alkylating agent

(A) Colchicine

(2) Carcinogen

(B) 6-Mercaptopurine

(3) Antimitotic agent

(C) Cyclopentamine

(4) Antimetabolite

(D) Thio- teпа

(E) Aflatoxin –B

(a) 1-D, 2-A, 3-E, 4-B

(b) 1-A, 2-B, 3-E, 4-C

(c) 1-E, 2-B, 3-D, 4-C

(d) 1-A, 2-E, 3-B, 4-D

2.12. Choose the correct synonymous words A to E for the given type of stomata –

(1) Anomocytic

(A) Caryophyllaceous

(2) Anisocytic

(B) Rubiaceous

(3) Diacytic

(C) Solanaceous

(4) Paracytic

(D) Ranunculaceous

(E) Cucurbitaceous

(a) 1-A, 2-B, 3-D, 4-C

(b) 1-A, 2-B, 3-E, 4-C

(c) 1-C, 2-E, 3-A, 4-B

(d) 1-A, 2-E, 3-B, 4-D

2.13. Given below are the drug and their antagonist ( A to (E) ). match them correctly –

(1) 5-HT

(A) Bemegride

(2) Codeine

(B) Atropine

(3) Phenobarbitone

(C) Cyproheptadine

(4) Muscarine

(D) Naloxone

(E) Pyridoxine

(a) 1-A, 2-B, 3-D, 4-C

(b) 1-A, 2-B, 3-E, 4-C

(c) 1-E, 2-B, 3-D, 4-C

(d) 1-C, 2-D, 3-A, 4-B

2.14. Select the appropriate colour from A to E for the given wave length –

(1) 450-480 nm

(A) Green

(2) 500-560 nm

(B) Yellow

(3) 575-590 nm

(C) Blue

(4) 675- 750 nm

(D) Orange

(E) Red

(a) 1-A, 2-B, 3-D, 4-C

(b) 1-A, 2-B, 3-E, 4-C

(c) 1-E, 2-D, 3-B, 4-C

(d) 1-A, 2-E, 3-B, 4-D

2.15. Match the solubility range from A to E as per I.P. with the following –

- |                        |                        |
|------------------------|------------------------|
| (1) Freely soluble     | (A) Less than 1 part   |
| (2) Soluble            | (B) 1 to 10 part       |
| (3) Sparingly soluble  | (C) 10 to 30 part      |
| (4) Less than 1 part   | (D) 30 to 100 part     |
|                        | (E) 100 to 1000 part   |
| (a) 1-A, 2-B, 3-D, 4-C | (b) 1-B, 2-C, 3-D, 4-E |
| (c) 1-E, 2-B, 3-D, 4-C | (d) 1-A, 2-E, 3-B, 4-D |

2.16. Given below the drug and their enzyme (A to E) inhibited by them. Match the following –

- |                        |                                |
|------------------------|--------------------------------|
| (1) Physostigmine      | (A) COMT                       |
| (2) Imipramine         | (B) Acetaldehyde dehydrogenase |
| (3) Pyrogallol         | (C) Carbonic anhydrase         |
| (4) Disulfiram         | (D) Cholinesterase             |
|                        | (E) MAO                        |
| (a) 1-D, 2-E, 3-C, 4-A | (b) 1-D, 2-A, 3-C, 4-B         |
| (c) 1-D, 2-B, 3-A, 4-C | (d) 1-A, 2-C, 3-B, 4-D         |

2.17. According to drug and cosmetics rule a list of schedule are as follows. Match the appropriate statement A to D with them –

- |                        |  |
|------------------------|--|
| (1) Schedule G         | (A) Drugs used under medical supervision           |
| (2) Schedule P         | (B) Drug used only under medical supervision       |
| (3) Schedule J         | (C) Minimum equipment needed for a retail pharmacy |
| (4) Schedule N         | (D) Diseases that a drug should not claim to cure  |
|                        | (E) Life period of drugs                           |
| (a) 1-A, 2-B, 3-D, 4-C | (b) 1-E, 2-C, 3-D, 4-A                             |
| (c) 1-D, 2-B, 3-A, 4-C | (d) 1-A, 2-E, 3-D, 4-C                             |

2.18 Given below are the drugs and their structural moiety A to E responsible for the biological action. Match them correctly –

- |                        |   |
|------------------------|---|
| (1) Diphenhydramine    | (A) Lactone ring                                      |
| (2) Acetylcholine      | (B) Substitution at C <sub>3</sub> of barbituric acid |
| (3) Penicillin G       | (C) Onium group                                       |
| (4) Gardinal           | (D) Beta - lactam ring                                |
|                        | (E) 2-Aminoethyl side chain                           |
| (a) 1-A, 2-B, 3-D, 4-C | (b) 1-E, 2-C, 3-D, 4-A                                |
| (c) 1-D, 2-B, 3-A, 4-C | (d) 1-B, 2-A, 3-C, 4-D                                |

2.19. Given below are the diuretic and their possible mode of action A to E. Match them correctly-

- |                   |  |
|-------------------|--|
| (1) Acetazolamide | (A) Affecting the osmosis  |
| (2) Furosemide    | (B) Inhibits the active transport of Cl <sup>-</sup> at ascending loop of Henle                          |
| (3) Triamterence  | (C) Inhibits the reabsorption of Na <sup>+</sup> in mineralo corticoid dependent portion of renal tubule |



(4) Mannitol

(D) Carbonic anhydrase inhibitor

(a) 1-D, 2-B, 3-C, 4-A

(E) Causing acidosis

(b) 1-A, 2-B, 3-D, 4-C

(c) 1-D, 2-B, 3-A, 4-C

(d) 1-A, 2-C, 3-B, 4-D

**2.20. Match the following**

1. Vaccines

(a) Diphtheria antitoxin

2. Toxoids

(b) Tetanus immunoglobulin

3. Human Immune sera

(c) Polio

4. Animal immune sera

(d) Diphtheria

(A) 1-(c), 2-(d), 3-(a), 4-(b)

(B) 1-(b), 2-(d), 3-(a), 4-(c)

(C) 1-(d), 2-(c), 3-(a), 4-(b)

(D) 1-(a), 2-(c), 3-(d), 4-(b)

**PART - B**

**N.B. :** *Answer any twenty questions*

*If more than 20 questions are attempted only the first 20 will be considered.*

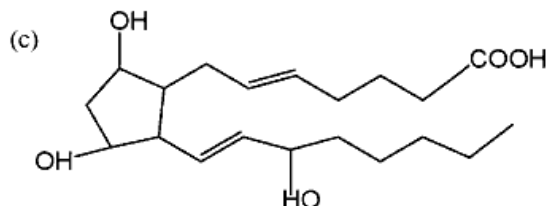
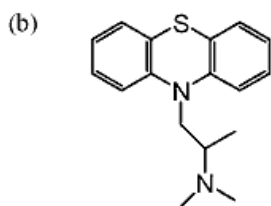
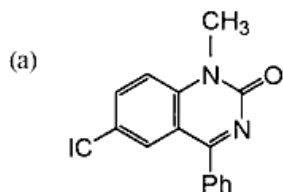
*Answer should not exceed 15 lines*

*All Question carry equal marks.*

- How arachidonic acid is liberated endogenously? Name its major groups of active metabolites.
- Write briefly and precisely (in 2-3 lines each) one the following terms
  - Chromophore
  - Auxochrome
  - R-bands
- Name the precautions to be followed in the manufacture of radiopharmaceutical preparations.
- Describe briefly (in about 10 lines) how absorbent cotton wool is prepared from comber waste
- Give the composition of black fluid as per schedule O. How are they graded? What is their respective Radial-Walker Coefficient
- Outline two step synthesis of aspirin from phenol, giving mechanism of each step.
- Balance the following equations
  - $\text{Cr}_2\text{O}_7^{+2} + \text{Fe}^{+2} = \text{Cr}^{+++} + \text{Fe}^{+++}$
  - $\text{MnO}_4^- + \text{H}_4\text{C}_2\text{O}_4 = \text{Mn}^{++} + \text{CO}_2$
  - $\text{H}_2\text{O}_2 + \text{I}^- = \text{I}_2 + \text{H}_2\text{O}$
- Give reasons for using lycopodium as standards as quantitative microscopy. Write the formula.
- Why water soluble ointment bases are in extensive use? Mention their specific properties

12. A prescription requires 500 ml of sodium chloride to be that it will contain 500 mEq of Na<sup>+</sup>. How many of NaCl (mw = 58.5) are required

13. Name the three important metabolic processes for each of the following drugs.



14. Give the most probable mechanism of action for each of the following (2-3 lines each)

(a) Indomethacin (anti-inflammatory)      (b) Warfarin (anticoagulant)

(c) Verapamil (antiarrhythmic)

15. (a) Calculate that approximate molarity of conc. HCl (Density of conc. HCl = 1.19, conc. HCl has a concentration of about 38% by weight

(b) Convert the given values of hydromium ion concentration to pH

(i)  $(H^+) = 4.5 \times 10^{-5} N$

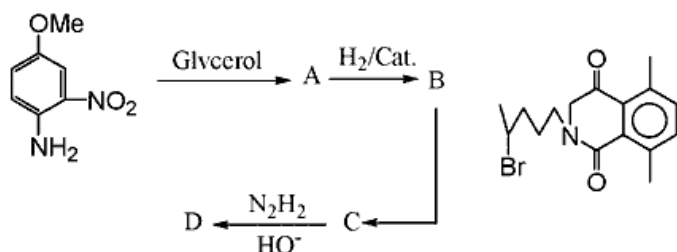
(ii)  $(H_2) = 0.00143 N$

16. What do you understand from "Static Test on prepared tablets" Explain briefly

17. Write therapeutic uses of caffeine, theophylline and theobromine. How do they differ in their action on CNS diuresis and respiration <http://www.xamstudy.com>

18. What is the bioavailability of drug? Mention the parameters important in evaluating the bioavailability of drugs

19. Give the principle involved in the official assay of sulfadimidine and Vit C.



20. Synthesis of primaquine is outline below. Give the structures of A-D Mention the names of the reactions involved in this synthesis.

21. What are prodrugs ? Mention their usefulness

22. Write briefly on the role of plasticizers in capsule

23. How will you avoid 'Caramelisation' in the preparation of injection? What is 'Leaker Test'?
24. How the entry of drugs molecule into the CNS is controlled ? What are the other biological varriers
25. How do the Blister package protect the content from moisture
26. Given below are some absorption frequencies in an IR spectrum. Indicate the appropriate functional group for the same  
 (a) 3500- 330  $\text{Cm}^{-1}$                       (b) 3030-3010  $\text{Cm}^{-1}$   
 (c) 1750  $\text{Cm}^{-1}$
27. Give only names of the enzymes involved in the biosynthesis of epinephrine form tyrosine

***End of paper***

**ANSWER KEY GATE 1988**

**Section - I**

1-d	2-c	3-b	4-a	5-d	6-a	7-b	8-c	9-b	10-a
11-c	12-d	13-b	14-b	15-a	16-c	17-d	18-b	19-b	20-c
21-a	22-d	23-c	24-b	25-c	26-b	27-a	28-c	29-b	30-c
31-b	32-a	33-b	34-a	35-b	36-b	37-c			

**Section - II**

2.1 - b	2.2 - a	2.3 - d	2.4 - b	2.5 - a	2.6 - a	2.7 - c	2.8 - c	2.9 - d	2.10-b
2.11-a	2.12-c	2.13-d	2.14-c	2.15-b	2.16-a	2.17-d	2.18-b	2.19-a	2.20-a