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OM—02—2026

FACULTY OF SCIENCE AND TECHNOLOGY

M.Pharm (First Year) (First Semester) EXAMINATION

July, 2026

MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES

MPH–101T

(Wednesday, 1-7-2026) **Time : 2.00 p.m. to 5.00 p.m.**

Time—3 *Hours* *Maximum Marks*—75

N.B. :— (*i*) *All* questions are compulsory.

(*ii*) Answer the questions to the point.

(*iii*) Figures to the right indicate full marks.

1. All the questions are compulsory : 10×2=20

(*a*) Distinguish between H^1NMR abd C^{13}NMR.

(*b*) Calculate various vibrations present into ethanol.

(*c*) Give the limitation of TGA. Compare to advanced techniques.

(*d*) What are the advantages of dobule beam over single beam application ?

P.T.O.

(e) Give the principle of spectrofluorimetry.

(f) Write the limitation of HPLC over UPLC.

(g) Give the principle of ion exchange chromatography.

(h) What is metastable ions ?

(i) Write the materials required for agarose gel electrophoresis.

(j) Give the benefit of graphite furnace analysis over flame analysis.

2. Solve any *two* : 2×10=20

(a) Write different types of ionization. Explain mass fragmentation and its rules.

(b) What is chemical shift ? Discuss various factors influencing chemical shift.

(c) Explain detectors used in IR spectroscopy. Write pharmaceutical application of it.

3. Solve any *seven* : 7×5=35

(a) What is FAB and MALDI ? Explain both techniques with its applications.

(b) What is spin-spin coupling ? Describe instrumentation of NMR spectroscopy.

(c) Give the principle and explain instrumentation of ion exchange chromatography.

(d) Describe various pumps used in HPLC/UPLC.

(e) Discuss various types of crystals and application of X-ray diffraction.

(f) Explain various stages used in data interpretation in mass spectroscopy.

(g) Explain various detectors used in gas chromatography on comparative mode.

(h) What is HPTLC ? Discuss various components used to analyze herbal formulation.

(i) Explain the phototube and photomultiplier detectors used in UV spectroscopy with superiority reason.

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OM—17—2026

FACULTY OF PHARMACEUTICAL SCIENCE

M.Pharm. (First Year) (First Semester) EXAMINATION

July, 2026

DRUG DELIVERY SYSTEM

(MPH-102-T)

(Friday, 3-7-2026) **Time : 2.00 p.m. to 5.00 p.m.**

Time—3 *Hours* *Maximum Marks*—75

N.B. :— (*i*) *All* questions are compulsory.

(*ii*) Figures to the right indicate full marks.

(*iii*) Draw neat and well labelled diagram wherever necessary.

1. Answer the following : 2×10=20

(*a*) Define Sustained Release (SR) and Controlled Release (CR) formulations.

(*b*) List *two* advantages of using polymers in drug delivery system.

(*c*) Name factors influencing drug release rate from SR/CR formulations.

(*d*) What is Pharmacogenetics ?

P.T.O.

(e) Define telepharmacy.

(f) Enlist types of feedback regulated drug delivery system.

(g) Mention principle of mucoadhesion in buccal drug delivery.

(h) Enlist primary barriers to drug permeation in occular drug delivery system.

(i) Give names of permeation enhancer used in transdermal drug delivery.

(j) Write the role of adjuvant in vaccine delivery.

2. Answer the following (any *two*) : 2×10=20

(a) Explain principles and fundamentals of gastro-retentive drug delivery system, including their advantages and disadvantages.

(b) Compare and contrast the mechanism of drug delivery from sustain release and control release formulation along with their applications.

(c) Describe formulation strategies for occular drug delivery, focusing on method to enhance drug absorption.

3. Answer any *seven* : 7×5=35

(a) Write types of modulated drug delivery with examples.

(b) Describe methods to overcome barriers in occular drug delivery system.

(c) Explain importance of protein peptide drug delivery system and their associated barriers.

(d) Write formulation strategies for mucosal vaccine delivery.

(e) Outline the structure of skin and write its significance in transdermal drug delivery.

(f) Describe applications of 3D printing in pharmaceuticals.

(g) Explain feedback regulated drug delivery.

(h) Describe evaluation for buccal drug delivery.

(i) Explain the challenges in development of single shot vaccines.

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OM—31—2026

FACULTY OF SCIENCE AND TECHNOLOGY

M.Pharm. (First Year) (First Semester) EXAMINATION

July, 2026

MODERN PHARMACEUTICS

(MPH-103-T)

(Monday, 6-7-2026) **Time : 2.00 p.m. to 5.00 p.m.**

Time—3 *Hours* *Maximum Marks*—75

N.B. :— (*i*) *All* questions are compulsory.

(*ii*) Answers to the point only.

(*iii*) Figures to the right indicate full marks.

(*iv*) Draw the digrams wherever necessary.

1. Answer the following : 10×2=20

(*a*) Give the objectives of preformulation study.

(*b*) Define large volume parenteral with example.

(*c*) What is optimization ?

P.T.O.

(d) Give the advantages of validation.

(e) What is total quality management ?

(f) Give the objectives of cGMP.

(g) Define Compression.

(h) Mention the significance of stability.

(i) Give the significance of chi-square test.

(j) What is Calibration ?

2. Solve any *two* of the following : 2×10=20

(a) Discuss the role of various physico-chemical characteristics of a new drug molecule in preformulation studies.

(b) Explain in detail factorial design and its applications.

(c) Describe in detail dissolution and pharmacokinetic parameters.

3. Solve any *seven* of the following : 7×5=35

(a) Explain evaluation tests for parenterals.

(b) Describe statistical design in optimization.

(c) Write validation and calibration of master plan.

(d) Describe in brief about materials management.

(*e*) Discuss the distribution of forces in compression.

(*f*) Write students T-test and ANOVA test.

(*g*) Explain ICH and WHO guidelines for calibration of equipments.

(*h*) Discuss the production and planning control.

(*i*) Write the physics of tablet compression.

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OM—45—2026

FACULTY OF SCIENCE AND TECHNOLOGY

M.Pharm. (First Semester) EXAMINATION

July, 2026

PHARMACEUTICAL REGULATORY AFFAIR

MPH-104T

(Wednesday, 7-7-2026) **Time : 2.00 p.m. to 5.00 p.m.**

Time—3 *Hours* *Maximum Marks*—75

N.B. :— (*i*) *All* questions are compulsory.

(*ii*) Figures to the right indicate full marks.

1. Solve all of the following : 10×2=20

(*a*) What is CFR ?

(*b*) What does ICH-Q and ICH-S guidelines stand for ?

(*c*) How can you submit application at global level ?

(*d*) What are regulatory bodies for Europe and Australia ?

P.T.O.

(e) What is e-CTD ?

(f) What is the role of CRO ?

(g) What does IMPD stand for ? How is it used in regulatory affairs ?

(h) What are para-IV filings of drugs ?

(i) What are key objectives of post-marketing surveillance ?

(j) What are objectives of HIPAA ?

2. Answer any *two* of the following : 2×10=20

(a) Describe NDA process.

(b) Elaborate informed consent process.

(c) Write a note on IRB. Highlight on its functions and composition.

3. Answer any *seven* of the following : 7×5=35

(a) Describe in detail about clinical research protocol.

(b) What is role of Pharmacovigilance ?

(c) Elaborate various stages of clinical trials.

(d) Describe in detail about DMI.

(*e*) Write in detail about CTD.

(*f*) Describe the role of Hatch-Waxman Act.

(*g*) What is role of outsourcing BA/Be studies ?

(*h*) Write a note on MFR.

(*i*) What is the process to develop generic drug ?