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**Total No. of Pages: 01**

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**M.Pharmacy (Pharmaceutics) (Sem.-1)**

## MODERN PHARMACEUTICS

**Subject Code: MPH-103T**

**M.Code: 74659**

**Date of Examination: 09-06-2026**

**Time: 3 Hrs.**

**Max. Marks: 75**

**INSTRUCTIONS TO CANDIDATES:**

1. Attempt any FIVE questions out of SIX questions.
2. Each question carries FIFTEEN marks.

1. What is optimization with respect to dosage form design? Enumerate different optimization designs and explain the contour design taking a hypothetical example. Mention the limitations of employing optimization design.
2. (A) Define different types of validation protocols and mention their use.  
(B) Critically comment on the formulation ingredients used for LVPs.
3. (A) Outline the procedure for validating an ODT tablet dosage form.  
(B) Discuss the cGMP norms for layout of buildings.
4. (A) Highlight issues to be considered for inventory control and management in a liquid dosage form manufacturing plant.  
(B) Explain the distribution of forces during compaction of solids.
5. (A) Briefly explain dissolution parameters.  
(B) What is the significance of Heckel Plot? Discuss the nature of Heckel Plot for substances of different nature.
6. Write short notes on (Any Three): (A) Stability testing of emulsions (B) ANOVA test  
(C) Revalidation (D) Sales forecasting

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**Total No. of Questions: 06**

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**M. Pharmacy (Pharmaceutics) (Sem.-1)**

## DRUG DELIVERY SYSTEM

Subject Code: MPH-102T

M.Code: 74658

**Date of Examination: 16-06-2026**

Time: 3 Hrs.

Max. Marks: 75

**INSTRUCTIONS TO CANDIDATES:**

1. Attempt any FIVE questions out of SIX questions.
2. Each question carries FIFTEEN marks.

- (a) Discuss the biological approaches for design of oral sustained release formulations.
  - (b) Giving examples explain the influence of pharmacogenetics in dosage form design and formulation.
- (a) Enumerate different types of enzyme activated drug delivery systems and give a brief account of the formulation strategy adopted for them.
  - (b) Discuss the mechanisms of muco adhesion and give examples of polymers used in such dosage forms.
- (a) Critically discuss the approaches used for overcoming challenges for successful ocular drug delivery.
  - (b) What are percutaneous permeation enhancers? Classify them and briefly describe their mechanism of action.
- (a) Enumerate the approaches employed for oral protein delivery. Discuss any one in detail.
  - (b) Write briefly about mucosal delivery of vaccines and the formulation ingredients used in such vaccines.



5. (a) Discuss the tests employed for evaluating transdermal formulations.  
(b) Explain 3D printing process and mention its applications.
6. Write short notes on:
  - (a) Biodegradable polymers
  - (b) Telepharmacy
  - (c) Uptake of antigens

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**Total No. of Questions: 06**

**Subject Code: MPH-101T**

M.Code: 74657

**Date of Examination: 13-06-2026**

Time: 3 Hrs.

Max. Marks: 75

**INSTRUCTIONS TO CANDIDATES :**

1. Attempt any FIVE questions out of SIX questions.
2. Each question carries EQUAL marks.

1. (a) Explain the working of a spectrofluorometer with the help of its schematic layout.

Discuss various detectors used in it.

- (b) How solvent polarity affects UV absorption spectrum of an enone type molecule?

Discuss with example.

2. (a) Discuss various factors affecting chemical shift.

- (b) How will you differentiate between 1,2-dinitrobenzene and 1,4-dinitrobenzene based on their  $^1\text{H-NMR}$  spectra?

3. (a) Define the following terms:

- (i) Isotope peak

- (ii) Metastable ion

- (iii) Base peak

- (iv) Pseudomolecular ion

- (b) What are various analysers used in a mass spectrometer? Describe the theoretical and working principle of separation of ions with the help of a neat well labelled diagram of any one analyser.



4. Explain the principle, instrumentation and applications of HPLC.

5. Write short notes on:

- (a) Moving boundary electrophoresis

- (b) X-ray diffraction method

- ### (c) Bioluminescence

6. (a) What is the principle of IR spectroscopy? Differentiate between dispersive and FT infrared spectrophotometer.

- (b) Describe the principle of ion-exchange chromatography. Write a descriptive note on various stationary phases used in it.

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**M. Pharmacy (Pharmaceutics) (Sem.-1)**

## REGULATORY AFFAIRS

**Subject Code : MPH-104T**

**M.Code :74660**

**Date of Examination: 11-06-2026**

**Time : 3 Hrs.**

Max. Marks: 75

**INSTRUCTIONS TO CANDIDATES :**

1. Attempt any FIVE questions out of SIX questions.
2. Each question carries FIFTEEN marks.

1. (a) Write a note on Hatch-Waxman Act.  
(b) Mention the data to be submitted for NDA approval.
2. (a) Discuss the protocol for a BE study.  
(b) What do you mean by ANDA? Outline the ANDA approval process.
3. (a) Discuss in detail about IVIVC.  
(b) Write a note on CTD.
4. (a) Explain the role of Institutional Review Board in clinical trials.  
(b) Discuss the requirements for HIPAA compliance.
5. Discuss the provisions of ICH-E and ICH-M.
6. What are Phase IV studies? How are they conducted? Discuss the procedure and outcomes of Phase IV studies in detail.

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M.Pharmacy (Pharmaceutics) (Sem.-2)

**COSMETIC & COSMECEUTICALS**

Subject Code: MPH-204

M.Code: 74964

Date of Examination: 21-05-2026

Time: 3 Hrs.

Max. Marks: 75

**INSTRUCTIONS TO CANDIDATES:**

1. Attempt any FIVE questions out of SIX questions.
2. Each question carries FIFTEEN marks.

1. Define cosmetic products as per Indian regulation. How cosmeceuticals evolved from cosmetics. Differentiate between misbranded and spurious cosmetics.
2. What are emollients. What are basic ingredients used for preparation of moisturizing creams. Explain the method used for preparation of moisturizing creams.
3. What are rheological additives. Classify various rheological additives with suitable examples. How can they be used to achieve desirable consistency of a given cosmetic formulation?
4. What is SPF. How is SPF determined. Classify sunscreens on the basis of their UV light protection.
5. Draw a neatly labelled diagram showing structure of hair. List phases of hair growth cycle. Discuss a typical formulation of an antidandruff shampoo.
6. What are challenges in formulation of herbal cosmetics. Write a note on perfume ingredients listed as allergens in EU regulation?

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**M.Pharmacy (Pharmaceutics) (Sem.-2)**

## ADVANCED BIOPHARMACEUTICS & PHARMACOKINETICS

Subject Code : MPH-202

M.Code :74962

Date of Examination: 14-05-2026

Time : 3 Hrs.

Max. Marks: 75

**INSTRUCTIONS TO CANDIDATES :**

1. Attempt any FIVE questions out of SIX questions.
2. Each question carries FIFTEEN marks.

1.(A) Discuss the role of  $pK_a$  of drug and  $pH$  of biological fluid influencing drug absorption.

(B) Describe the Noyes-Whitney equation and explain its utility in explaining drug dissolution.

2.(A) Discuss the IVIVC levels.

(B) Discuss the methods used for enhancing the bioavailability of BCS class III drugs.

3.(A) Derive equations to explain the pharmacokinetics of a drug administered by IV infusion and following one-compartment open model.

(B) Write a note on plasma protein binding and its implications.

4.(A) Write a note on the role of drug interactions influencing drug transporters.

(B) Write a note on the drugs/dosage forms that are exempted from bioequivalence studies.

5.(A) What is non-linear pharmacokinetics? Mention the reasons for this behavior with suitable examples and clinical implications of non-linear behavior.

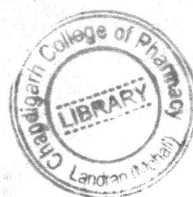
(B) Discuss briefly the study designs used for bioequivalence evaluation. Mention the limitations and advantages of each design.

6. Write short notes on:

(A) Tight junctions and drug absorption.

(B) Gut P450 based drug interaction and drug absorption.

(C) Sink conditions during dissolution.



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M.Pharmacy (Pharmaceutics)(Sem.-2)  
**MOLECULAR PHARMACEUTICS**  
**(NANO TECH AND TARGETED DDS)**  
Paper Code: MPH-201

Subject Code: MPH-201

M.Code: 74961

Date of Examination: 11-05-2026

Max. Marks: 75

Time: 3 Hrs.

INSTRUCTIONS TO CANDIDATES:

- INSTRUCTIONS TO CANDIDATES:**
1. Attempt any FIVE questions out of SIX questions.
  2. Each question carries FIFTEEN marks.

1. (a) Enumerate the strategies adopted for targeting drug delivery to the brain and discuss each briefly.  
(b) Which approaches are employed for targeting drugs to tumours? Give a brief account of these approaches.
2. (a) What are nanoparticles? Mention the methods employed for preparing them and discuss any one method giving its major limitations.  
(b) Give a brief account of Phytosomes and their applications.
3. (a) Give a brief account of nasal drug delivery systems and specific applications of intranasal drug delivery.  
(b) Give a brief account of non-viral gene expression systems.
4. (a) What is meant by gene therapy? Mention few diseases where gene therapy is useful and outline the approaches used for this purpose.  
(b) Discuss the formulation and applications of liposomal gene delivery systems.



5. Write short notes on:

- (a) Niosomes
  - (b) Evaluation of nasal drug delivery systems
  - (c) Aquasomes and their limitations
7. Critically comment on:
- (a) Evaluation of aerosols
  - (b) Antisense molecules for disease treatment
  - (c) Types of aerosols for drug delivery

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**M.Pharmacy (Pharmaceutics) (Sem.-2)**

## COMPUTER AIDED DRUG DELIVERY SYSTEM

Subject Code : MPH-203

M.Code : 74963

Date of Examination : 18-05-2026

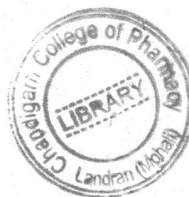
Time : 3 Hrs.

Max. Marks: 75

**INSTRUCTIONS TO CANDIDATES :**

1. Attempt any FIVE questions out of SIX questions.
2. Each question carries FIFTEEN marks.

1. (a) Highlight the history of computers in pharmaceutical research and development.  
(b) What is optimum design and statistical parameters.
2. (a) Explain convolution and deconvolution with example of each.  
(b) Highlight ICH Q8 guidelines for the pharmaceutical development.
3. Write short note on modeling of drug disposition using:  
(i) Intestinal Permeability  
(ii) P-gp  
(iii) Drug excretion
4. (a) What is artificial Intelligence? How are the principles of AI used in the Pharmaceutical Benefits?  
(b) Write short note on:  
(i) Model construction  
(ii) Parameters sensitivity analysis
5. (a) What are Transporters? How are the principles of Transporters used in modeling techniques? Explain with examples.



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(b) Highlight the computer simulations in isolated tissue. How is it different from whole organism?

6. Write short note on:
- (a) Confidence Regions and nonlinearity at the optimum.
  - (b) ABC binding cassettes
  - (c) Clinical Data

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