

# INDIRA UNIVERSITY, PUNE

## SCHOOL OF PHARMACY- M.PHARM (PHARMACEUTICS)

Term End Examination (2025 Pattern) December – 2025 - Semester – I

---

**Subject Name: Drug Delivery System**  
**Subject Code: MPH102T**

**Max. Marks: 75**  
**Time: 3 Hours**

---

### Instructions

- Instructions 1-All Questions are Compulsory. Write two sections on separate answer sheets.
  - Instructions 2 -Neat diagram must be drawn wherever necessary.
  - Instructions 3- Figures to the right indicate full marks
- 

### Section : I

**Q.1 Solve any ONE from the following** **15 Marks**

- a Classify polymers and highlight their important applications in pharmaceutical formulation. Discuss various theories of mucoadhesion.
- b Explain the concept, rationale and mechanism of personalized medicines. Write a note on telepharmacy.

**Q.2 Solve any FOUR from the following** **20 Marks**

- a Enlist marketed 3D printed pharmaceutical formulations. Elaborate on Fused Deposition Modelling (FDM).
- b Describe approaches used in design of floating delivery system.
- c Discuss in short buccal drug delivery system.
- d Explain in brief pH activated drug delivery system.
- e Explain concept of pharmacogenomics.
- f Write the merits and limitations of mucoadhesive delivery systems.

### Section : II

**Q.3 Solve any ONE from the following** **15 Marks**

- a Describe barriers in protein drug delivery system. Write a note on novel delivery systems for proteins.
- b Critically discuss the structural organization of the skin and its barrier functions influencing transdermal drug delivery, highlighting advanced strategies used to overcome these barriers with examples.

**Q.4 Solve any TWO from the following**

**15 Marks**

- a Describe single shot vaccines & vaccine adjuvants
- b Describe in detail components and evaluation of TDDS.
- c Summarize physical instability of proteins and strategies to enhance stability in delivery systems.
- d Explain enzyme activated drug delivery system.

**Q.5 Solve any TWO from the following**

**10 Marks**

- a Write in detail about the factors influencing skin permeation.
- b Describe cellular and humoral immunity.
- c Describe various barriers of drug permeation in ocular drug delivery system.
- d Explain parenteral route of protein drug delivery system.