Name: **Enrolment No:**	UPES UNIVERSITY OF TOMORROW

UPES

End Semester Examination December 2025

Course: Novel Drug Delivery Systems **Semester: VII**
Program: B. Pharm **Duration: 03 Hours**
Course Code: BP704T **Max. Marks: 75**
Instructions: No additional material like graph paper, log table, *etc*. is allowed for this examination.

SECTION A

(20 Q x 1 M = 20 Marks)

S. No.	Attempt all questions from section A.	Marks	COs
Q 1	A reservoir-type system is best represented by a) Matrix tablet b) Osmotic pump c) Chewable tablet d) Dispersible tablet	**1**	**CO1**
Q 2	Below property of a drug is most important for controlled release a) High dose requirement b) Good aqueous solubility c) Short half-life d) Very high permeability	**1**	**CO1**
Q 3	Microencapsulation is the process of a) Increasing drug permeability b) Enclosing solids/liquids in small capsules c) Reducing drug activity d) Increasing drug toxicity	**1**	**CO1**
Q 4	The polymer swelling mechanism is used in a) Erosion-based systems b) Diffusion-based systems c) Osmotic pump tablets d) Floating dosage forms	**1**	**CO1**
Q 5	Controlled release drug delivery systems usually follow a) Zero order kinetics b) First order kinetics c) pH dependent kinetics d) None of the above	**1**	**CO1**
Q 6	Higuchi's plot is best explained by a) Log cumulative percentage of drug released *versus* square root of time. b) Cumulative percentage of drug released *versus* square root of time. c) Log cumulative percentage of drug released *versus* log time. d) Log cumulative percentage of drug remaining to release *versus* time.	**1**	**CO1**
Q 7	Mucoadhesion mainly involves a) Protein denaturation b) Formation of hydrogen bonds c) Ion trapping in mucous membrane d) Polarity reversal at skin surface	**1**	**CO1**

Q 8	Bioadhesive polymers include a) PLGA b) Carbopol c) Sodium bicarbonate d) Calcium chloride	**1**	**CO1**
Q 9	Ideal molecular weight for transdermal delivery a) > 1000 Da b) < 500 Da c) > 5 kDa d) < 10 Da	**1**	**CO1**
Q 10	Chemical permeation enhancers act by a) Increasing viscosity b) Increasing lipid fluidity c) Decreasing drug solubility d) Increasing blood glucose	**1**	**CO2**
Q 11	Below is the correct option indicating formulations that are developed from self-assembly of hydrated surfactant monomers a) Niosomes b) Metal nanoparticles c) Magnetic nanoparticles d) Metal oxide nanoparticles	**1**	**CO2**
Q 12	Implantable systems are typically made from a) Biodegradable polymers b) Sugars c) Paraffin d) Chemical permeation enhancers	**1**	**CO2**
Q 13	Mucosal permeability increases when a) Mucin thickness decreases b) Saliva volume decreases c) Hydration decreases d) pH remains constant	**1**	**CO2**
Q 14	Liposomes can encapsulate a) Only hydrophilic drugs b) Only lipophilic drugs c) Both hydrophilic and lipophilic drugs d) None of the above	**1**	**CO3**
Q 15	Reservoir-type TDDS differ from matrix-type by having a) Drug dispersed throughout matrix b) Drug stored in a separate compartment c) No backing layer d) No adhesive layer	**1**	**CO3**
Q 16	At physiological pH, mucus network carries_____. a) Positive charge. b) Negative charge. c) Both positive and negative charge. d) No charge.	**1**	**CO3**

Q 17	Inflatable GRDDS expand due to a) Osmotic agents b) Hydrophobic coating c) Air pressure from food d) Surfactants	**1**	**CO3**
Q 18	Solvent evaporation method is the most widely used for the preparation of micro-encapsules because a) It is a simple technique b) This method allows encapsulation of hydrophobic and hydrophilic drug. c) Microcapsules produced by this method have wide particle size range. d) All of the above.	**1**	**CO4**
Q 19	Passive targeting involves a) Receptor binding b) Enhanced permeability and retention (EPR) effect c) Ligand-receptor interaction d) Antibody conjugation	**1**	**CO4**
Q 20	Monoclonal antibodies are produced by a) Hybridoma technology b) Fermentation c) Gel filtration d) Ultrapurification	**1**	**CO4**
SECTION B (20 Marks) (2 Q x 10 M = 20 Marks)			
	Attempt any two questions from section B.	**Marks**	
Q 1	Enlist various advantages of gastro-retentive drug delivery systems? Discuss gastro-retentive drug delivery systems based on floating mechanism.	**3 + 7**	**CO2**
Q 2	Describe the structure, preparation (by thin film hydration method), and evaluation parameters of liposomes.	**2+3+5**	**CO3**
Q 3	Define microencapsulation? Explain, with example, the process of microencapsulation by temperature change and non-solvent addition methods.	**2 + 8**	**CO4**
SECTION-C (35 Marks) (7 Q x 5 M = 30 Marks)			
	Attempt any seven questions from section C.	**Marks**	
Q 1	Explain the concept and working of osmotic pump.	**5**	**CO1**
Q 2	Explain the factors affecting transdermal drug delivery.	**5**	**CO1**
Q 3	Classify and explain various polymers used in formulation of controlled drug delivery systems.	**5**	**CO2**
Q 4	Explain the basic components of transdermal drug delivery systems.	**5**	**CO2**
Q 5	Explain the principles and stages of bioadhesion/mucoadhesion.	**5**	**CO2**
Q 6	Describe advantages and disadvantages of implantable drug delivery systems.	**5**	**CO3**
Q 7	Explain various formulation considerations for ocular inserts.	**5**	**CO3**
Q 8	Explain various evaluation parameters for nanoparticles.	**5**	**CO4**
Q 9	Write a note on copper bearing intrauterine devices.	**5**	**CO4**