

Duration: 3 Hours

Total marks: 75

N.B.: 1. All questions are compulsory

2. Figures to right indicate full marks.

Question No.	Question	Max. Marks
<b>Q.I</b>	<b>Multiple Choice Questions (Answer all of the following):</b>	<b>20</b>
<b>1</b>	The biological factor to be considered in selection of a drug candidate to be formulated as a sustained release drug delivery system is: a) margin of safety b) molecular size c) drug stability d) protein binding	<b>1</b>
<b>2</b>	The following drug release aspect depicts an immediate release dosage form: a) $k_r - k_a = 0$ b) $k_r \gg k_a$ c) $k_r \ll k_a$ d) $k_r = k_a$	<b>1</b>
<b>3</b>	_____ polymers cannot be reshaped on heating. a) Thermosetting b) Elastic c) Thermoplastic d) Plastic	<b>1</b>
<b>4</b>	Amorphous polymers: a) are opaque b) have a melt transition temperature c) show strong intermolecular forces d) have a glass transition temperature	<b>1</b>
<b>5</b>	Phase separation – coacervation can be brought about by all these processes except: a) Congealing b) Solvent evaporation c) Non Solvent addition d) Salt addition	<b>1</b>
<b>6</b>	In case of microencapsulation by multiorifice centrifugal process, following are the process variables that affect the quality of product except: a) Atomization speed b) Rotational speed of cylinder c) Flow rate of core and coating materials d) Viscosity of core and coating materials	<b>1</b>

- 7 Modified balance method is used to evaluate: **1**
- a) adhesive strength
  - b) drug release
  - c) swelling
  - d) particle size
- 8 Hydrogen bonds in mucoadhesion are formed by: **1**
- a) dipole moment
  - b) non polar groups
  - c) dispersion forces
  - d) electronegative atoms
- 9 Alzet is an example of following type of system: **1**
- a) Vapour pressure activated
  - b) Osmotic pressure activated
  - c) Magnetically activated
  - d) Hydration activated
- 10 The following IUD has a suspension of 4-Pregnene-3,20-dione in a silicone medical fluid encapsulated in the vertical limb of T-shaped device: **1**
- a) Progestasert
  - b) Cu-7
  - c) Cu-T-200
  - d) Nova-T
- 11 Polyisobutylene is used in transdermal patches as: **1**
- a) permeation enhancer
  - b) backing membrane
  - c) pressure sensitive adhesive
  - d) drug reservoir
- 12 Use of high frequency ultra-sound to increase transdermal penetration is: **1**
- a) Iontophoresis
  - b) Sonophoresis
  - c) Electrophoration
  - d) Pinocytosis
- 13 An effervescent-based GRDDS is based on following type. **1**
- a) Hydrodynamically-balanced
  - b) Magnetic
  - c) Expandable
  - d) Raft
- 14 What is used to increase the density of gastroretentive systems? **1**
- a) titanium dioxide
  - b) boric acid
  - c) potassium chloride
  - d) polyethylene

- 15 The \_\_\_\_\_ mechanism can improve the deposition of highly charged aerosols. **1**
- a) Electrostatic precipitation
  - b) Interception
  - c) Sedimentation
  - d) Diffusion
- 16 The following is an administration factor affecting bioavailability of drugs following intranasal administration: **1**
- a) size of the droplet
  - b) speed of mucus flow
  - c) presence of infection
  - d) pathological condition of nasal cavity
- 17 Which of these is the non-clinical benefit offered by NDDS? **1**
- a) Avoidance of costly interventions
  - b) Site specific delivery
  - c) Reduced side effects
  - d) Reduced fluctuations
- 18 Which of the following is a polymer precipitation technique used in the preparation of nanoparticles? **1**
- a) Chemical crosslinking method
  - b) Dispersion polymerization method
  - c) Interfacial complexation method
  - d) Salting out method
- 19 The ocular insert developed for cosmonauts who could not use eyedrops in weightless conditions was: **1**
- a) SODI
  - b) Lacrisert
  - c) Minidisc
  - d) NODS
- 20 Which of the following is a non-erodible ocular insert? **1**
- a) SODI
  - b) Lacrisert
  - c) Minidisc
  - d) Ocusert

**QII Answer any Two questions of the following: 20**

- 1 Discuss in detail on controlled release formulations based on the principle of dissolution control mechanism. **10**
- 2 Write in detail the spray drying method of microencapsulation. Explain how it differs from the spray congealing method. **10**
- 3 Provide the rationale for design of ocular inserts. Classify them giving their advantages and limitations. Explain Lacrisert in brief. **10**

**QIII Answer any Seven questions of the following: 35**

- 1 State what do you mean by a zero order release profile. Differentiate between Controlled release and Sustained release formulations. **5**
- 2 Write a note on polymers explaining their properties for use in controlling drug release. **5**
- 3 With the help of diagrams, explain various designs of buccal tablets. **5**
- 4 Give a brief account of nebulizers. **5**
- 5 Explain the principle and working of the Alzet osmotic pump. **5**
- 6 Give the formulation components of a transdermal patch with examples. **5**
- 7 Briefly explain the non-floating approaches for gastroretention. **5**
- 8 With the help of an example discuss the components of liposomes. **5**
- 9 Write a short note on Ocusert. **5**

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