Sem-VII
Semester Exam
25/11/2024

Duration: 3 hours **Total Marks: 75**

NB: 1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Draw neat labelled diagrams wherever necessary.

Q. 1. Multiple Choice Questions. Write the Correct Option (Answer all) **20**

1 Which of the following is a system comprising of a rate-controlling polymer matrix throughout which a drug is dissolved or dispersed? 1
a) Monolithic system
b) Micro-reservoir system
c) Reservoir system
d) Sandwich system

2 Identify the polymer that would release the drug by surface erosion mechanism 1
a) Poly(lactic-co-glycolic acid)
b) Polyanhydrides
c) Polycaprolactone
d) Polyvinyl alcohol

3 Which type of polymer has chains interconnected by bonds, forming a three-dimensional network that enhances its mechanical strength and stability? 1
a) Linear polymer
b) Branched polymer
c) Crosslinked polymer
d) Unbranched polymer

4 Which amongst these is a hydrophobic, cellulose-based polymer finding applications in sustained-release? 1
a) Hydroxypropyl Methylcellulose
b) Sodium Carboxymethyl Cellulose
c) Hydroxypropyl Cellulose
d) Ethyl Cellulose

5 Which of the following is an advantage of microencapsulation? 1.
a) Prevent oxidation of active ingredients
b) Decrease stability of APIs
c) Increase adverse effects
d) Decrease shelf life

6 Which of the following techniques is most commonly employed for applications requiring highly consistent microcapsule size? 1
a) Pan coating
b) Multiorifice-centrifugal technique
c) Spray drying
d) Phase separation-coacervation technique

7 A mucoadhesive buccal tablet is being developed. What key characteristic should the tablet have to ensure sustained drug release? 1
a) Low mucoadhesive strength
b) High polymer concentration with controlled swelling
c) High solubility in saliva
d) Rapid dissolution in the oral cavity

8 Which theory of mucoadhesion is based on the interpenetration of polymer and mucin chains? 1

a) Electronic theory
b) Diffusion theory
c) Wetting theory
d) Fracture theory

9 What is the primary mechanism by which drug release is controlled in an Alzet osmotic pump? 1

a) Diffusion through the membrane
b) Erosion of the drug core
c) Osmotic pressure driving water into the core
d) Chemical reaction within the implant

10 A gynaecologist is considering a new IUD design with a silver core. What is the primary advantage of adding silver to the IUD? 1

a) To increase hormone release
b) To reduce copper fragmentation and prolong the device's lifespan
c) To enhance contraceptive efficacy
d) To make the device radiopaque

11 What is the function of the release liner in a transdermal patch? 1

a) Increase the patch's adhesion
b) Provide structural support
c) Enhance drug release rate
d) Protect the adhesive and drug during storage and before application

12 Which of the following tests is used to evaluate the adhesive strength of a transdermal patch? 1

a) In vitro drug release test
b) Moisture content test
c) Peel test
d) Weight uniformity test

13 What is the role of bicarbonates in an effervescent floating system? 1

a) They liberate carbon dioxide
b) They neutralise stomach acid
c) They act as a binding agent
d) They dissolve the drug

14 Which floating system forms a cohesive gel barrier in the stomach? 1

a) Raft-forming systems
b) High-density system
c) Osmotic system
d) Bioadhesive system

15 A common preservative used in nasal sprays is: 1

a) Sodium chloride
b) Benzalkonium chloride
c) Ethanol
d) Polyethylene glycol

16 This system uses a piezoelectric crystal in a pulmonary drug delivery system. 1

a) Ultrasonic nebulizer
b) Air jet nebulizer
c) Aerosol
d) Metered dose inhalers

17 Which substance is often used as a fusogen in the production of monoclonal antibodies? 1

a) Ethanol
b) Methanol
c) Polyethylene glycol
d) Acetone

18 In nanoparticle characterisation, which method determines particle size? 1

a) Light microscopy
b) Gel chromatography
c) Photon correlation spectroscopy
d) UV-Vis spectrophotometry

19 The material used in the construction of a Lacrisert is: 1

a) Hydroxypropyl methylcellulose
b) Hydroxypropyl cellulose
c) Hydroxyethylcellulose
d) Methylcellulose

20 Which polymer is responsible for thermo-sensitive hydrogel formation at ocular surface temperature? 1

a) Pluronics (Poloxamer)
b) Polyvinyl alcohol
c) Sodium alginate
d) Chitosan

Q. 2. Answer Any TWO **20**

1 Discuss the criteria for selecting a drug to be developed as a sustained-release delivery system 10

2 Outline the applications of microencapsulation and compare the techniques of spray drying and spray congealing. 10

3 List the types of ocular inserts and describe the non-erodible variants in detail. 10

Q. 3. Answer Any SEVEN **35**

1 Describe dissolution-controlled systems designed for extended drug delivery. 5

2 Define polymers and discuss their properties relevant to controlled-release drug formulations. 5

3 Provide an overview of mucoadhesive polymers. 5

4 Explain the basics, benefits, and drawbacks of dry powder inhalers. 5

5 Summarise the historical progression of intrauterine devices. 5

6 Discuss transdermal permeation enhancers. 5

7 Examine high-density and inflatable systems as gastroretentive delivery methods. 5

8 Briefly discuss targeted drug delivery, including its benefits and limitations. 5

9 Provide a brief overview of in-situ gelling systems for ocular drug delivery. 5
