Question Paper

Exam Date & Time: 06-Jan-2021 (01:30 PM - 04:30 PM)

MANIPAL ACADEMY OF HIGHER EDUCATION

Novel Drug Delivery Systems [PCE-BP704T - S2]

Marks: 75 **Duration: 180 mins.**

I Multiple Choice Questions (MCQs)

Answer all the questions. Section Duration: 30 mins

1) The formulation of drugs as salts can - Select most likely one (1)

- Improve the solubility and dissolution
- Improve solubility only
- Improve dissolution rate only
- Improve stability and processability of DDS

2) Cyclodextrins are used to - Choose the wrong one (1)

- improve the water solubility of poorly water-soluble drugs
- prepare drug-cyclodextrin complexes which mask the taste of drug
- prepare drug-cyclodextrin complexes which decrease gastric irritation of the drug
- reduce the solubility of poorly water-soluble drugs

3) Choose the correct statement of the following (1)

- Super disintegrants are used to increase the solubility of a drug
- Super disintegrants are used to decrease the solubility of a drug
- Super disintegrants make the dissolution rate of a drug independent of the conditions under which the test is performed
- Super disintegrants are usually chemically cross linked and water insoluble.

4) Choose the incorrect statement of the following for a dissolution based sustained release dosage forms (1)

- The rate of drug release can be decreased by lowering the drug dissolution rate
- The rate of drug release can be decreased by increasing the drug particle size
- The rate of drug release can be decreased by incorporating the drug into a slowly dissolving matrix coating of the drug with a slowly dissolving film
- The rate of drug release can be decreased by incorporating the drug into a fast-dissolving matrix coating of the drug with a fast dissolving film

5) Which one of the following is NOT correct? (1)

- Hydrodynamically balanced systems use gel-forming hydrophilic polymers which swell and entrap air within the dosage form
- Effervescent excipients such as bicarbonate or carbonate can be used to enhance buoyancy of delivery systems
- Gastroretentive DDS based on density differences of the gastric fluid are independent of GI fluid quantity
- Dosage forms with densities of less than approximately 1 g/cc will float on the gastric fluids

6) In ..... method of microencapsulation, two mutually immiscible liquids are pumped through a spinning two-fluid nozzle. (1)

- Fluidized bed coater
- Centrifugal extrusion

Spray drying
Spray congealing

7) Polyvinyl alcohol is used as ..... in the preparation of microcapsules. (1)

an active constituent
a diluent
a stabilizer
a drug release rate retardant

8) Zein is the coating material for microcapsules of which category? (1)

Water soluble resin
Water insoluble resin
Wax and lipid resin
Enteric coating resin

9) Matrix systems are also called as (1)

Microspheres
Reservoir system
Monolithic systems
All of the above

10) Following are the applications of microcapsules EXCEPT (1)

Helps in drug targeting
Dose dumping
Improves drug bioavailability
Reduces GI irritations of drugs

11) What is the use of dimethyl sulfoxide in mucoadhesive dosage forms? (1)

Permeation enhancer
Solubilizing agent
Coloring agent
Flavoring agent

12) Which type of gastro-retentive drug delivery system is less effective? (1)

Swelling and expanding systems
Floating systems
Muco-adhesive and bio-adhesive systems
High density systems

13) Which of the following evaluation test is essential for floating dosage forms? (1)

Porosity
Muco-adhesive strength
Buoyancy lag time
Swelling index

14) What is the maximum particle size preferred for solid particle blend containing drug in dry powder inhalers? (1)

Less than 0.05 µ
Less than 0.5 µ
Less than 5 µ
Less than 50 µ

15) Use of hydrogels (for gastro retentive DDS) with large pore sizes allows the DDS to (select the unlikely one of the following) (1)

rapidly and strongly swell in size

rapidly swell in size
swell to a sufficient size to achieve gastric retention
pass through the pylorus easily despite becoming too large by swelling

16) Bioerodible sustained-release systems (choose most likely one) (1)

release the drug due to erosion and/or degradation of the polymer matrix
release the drug due to only degradation of the polymer matrix
release the drug due to only degradation of the polymer matrix
release the drug depending on the geometry of the system

17) Drug release is controlled by diffusion through a polymer - Select the one which is TRUE (1)

The release profile of the drug is linear if plotted as a function of time
The release profile of the drug is linear if plotted as a function of cube root of time
The release profile of the drug is linear if plotted as a function of square root of time
The release profile of the drug is non-linear if plotted as a function of square root of time

18) Bioerodible and biodegradable polymers can be used to (choose most relevant one of the following) (1)

formulate sustained and controlled release systems
formulate sustained release systems only
formulate controlled release systems only
formulate immediate release systems only

19) Ocusert is an ocular insert which (choose most relevant one of the following) (1)

has a drug alginate mixture
gives controlled release of pilocarpine
is made from nonporous ethylene vinyl acetate copolymer membrane
is made from microporous ethylene acetate polymer membrane

20) Pregnancy rate of MLCu-250 is (1)

18%
5%
3%
0.3%

II Long Answers

Answer all the questions.

1) List and explain different approaches to design-controlled release formulations. Support your answer with examples. (10)

2) Elucidate in detail the factors influencing permeation of drugs from transdermal drug delivery systems. (10)

III Short Answers

Answer all the questions.

1) Elucidate the effect of polymers on mucoadhesion. (5)

2) Enlist the approaches involved in design of implants. Explicate the diffusion process based approaches. (5)

3) With examples explain the role of polymers in Immediate drug delivery systems, Sustained drug delivery systems. (5)

4) Write the plasma level drug concentration against time for sustained release and controlled release DDS. What information you can draw from these graphs? Explain. What are its limitations? (5)

5) List and explain the intra ocular barriers for ocular formulations. (5)

6) Discuss the fostering of Intra-uterine devices till date. (5)

7) Write a note on membrane-controlled reservoir type intrauterine drug delivery systems. (5)