Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/M.PHARM/SEM-2/MPT-206(1)/2013

2013

DRUG DELIVERY SYSTEM

Time Allotted : 3 Hours Full Marks : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for any *ten* of the following : 10 × 1 = 10

   i) FDA approved transdermal patch 'Transderm-Nitro' used for the treatment of angina pectoris is an example of

      a) polymer membrane permeation controlled system

      b) polymer matrix diffusion controlled system

      c) drug reservoir gradient controlled system

      d) microreservoir dissolution controlled system.

ii) Simple enteric coated tablets can be called

a) matrix system

b) reservoir system

c) diffusion controlled system

d) all of these.

iii) The toxicity profile of Amphotericin *B* was first clinically improved by formulating it in

a) solid lipid nanoparticles

b) liposomes

c) magnetic microparticles

d) niosomes.

iv) Water for injection shall meet microbiological specification of not more than

a) 10 cfu/ml

b) 10 cfu/100 ml

c) 500 cfu/ml

d) 100 cfu/ml.

v) A drug is unsuitable for incorporation into controlled release formulations if it has

a) low therapeutic index

b) biological half life of 2-8 hours

c) low dose

d) fast absorption.

vi) The class of agents that could be useful as permeation enhancer of protein and peptide drugs includes

a) bile salts

b) medium chain fatty acids

c) chelating agents

d) all of these.

vii) The drug release from inert polymer matrix type delivery system follows

a) first order kinetics

b) zero order kinetics

c) Higuchi square root kinetics

d) non-linear kinetics.

viii) Lecithin is also known as

a) Phosphatidyl inosital

b) Phosphatidyl choline

c) Phosphatidyl ethanolamine

d) Sodium deoxycholate.

ix) A graph of amount of drug released *vs* square root of time would be linear if the drug release is

a) Dissolution controlled

b) Diffusion controlled

c) Diffusion and dissolution controlled

d) Osmotic pressure controlled.

x) Which of the following drugs can be delivered by iontophoresis ?

a) Lignocaine b) Metoprolol

c) Salbutamol d) All of these.

xi) Buccal drug delivery system should be evaluated for *in vitro* release at

a) pH 4·5 b) pH 1·2

c) pH 6·8 d) pH 8·6.

xii) The isoelectric point of the skin is in between

a) 3 – 4 b) 4 – 5

c) 5 – 6 d) 6 – 7.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. 3 × 5 = 15

2. Write a note on iontophoresis with a line diagram of drug release mechanism.

3. Briefly enumerate the permeability enhancing mechanisms of poly (acrylate) derivatives for gastrointestinal delivery of protein and peptide drugs.

4. What do you mean by sink condition ? How is sink condition maintained in the body ?

5. Distinguish between bulk erosion and surface erosion from erodible matrix devices.

6. Write a note on coacervation phase separation technique.

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. 3 × 15 = 45

7. What are nanoparticles ? Enumerate any two methods of their preparation. How can you characterize nanoparticles ?

2 + 5 + 8

8. Illustrate the biopharmaceutical and pharmacokinetic considerations in the design of per-oral controlled release drug delivery systems. A prolonged action tablet formulation is to be designed for which an optimum blood drug level range is 8 – 16 mg%. The average biological half life of the drug is 8 hr. A 1·5 gm dose administered to a 70 kg patient yields a blood level of 6 mg% after 3 hr. The total amount elimianted during this time is 300 mg. At what rate must the drug be supplied to maintain a constant blood drug level of 12 mg% ? How much drug must be placed in the tablet to achieve duration of action of 12 hr ? 10 + 5

9. a) What do you mean by Tansdermal Drug Delivery System (TDDS) ?

   b) What are the physicochemical & pharmacokinetic criteria to be considered for selection of a drug in TDDS formulation ?

   c) Enumerate the different parameters for evaluation of TDDS. 2 + 4 + 9

10. Describe a flow sheet diagram for the preparation of large volume parenterals emphasizing HVAC system. Write a brief account on the excipients used in parenteral formulations. 10 + 5

11. Write notes on any *two* of the following : $2 \times 7\frac{1}{2}$

a) Brain targeted drug delivery

b) Characteristics of ocular drug delivery

c) Characterization of liposomes.