Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/M.PHARM/SEM-2/MPT-206(1)/2012

2012

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) In transdermal drug delivery, Azones and Pyrrolidones are used as

a) channeling agents

b) permeation enhancer

c) rate controlling polymers

d) all of these.

(ii) Drug targeting to intracellular sites is also known as

a) Primary Targeting b) Secondary Targeting

c) Tertiary Targeting d) None of these.

(iii) Tissue rejection may be avoided for implantable drug delivery systems by incorporating

a) Heparin b) Insulin

c) Glucocorticoids d) Eicosanoids.

(iv) NLCs, Dissocubes and SLNs are examples of

a) Polymeric nanoparticles

b) liposomal dispersions

c) surfactant aggregates

d) lipid nanoparticles.

v) Higuchi's square root equation is modified for heterogeneous matrices by incorporating the term

a) tortuosity/porosity b) porosity/density

c) porosity/tortuosity d) density/porosity.

vi) Drug Eluting Stents are examples of

a) site specific drug delivery systems

b) localized drug delivery systems

c) implantable drug delivery systems

d) targeted drug delivery systems.

vii) Keshary-Chien apparatus may be used to evaluate drug release from

a) Microparticles b) Nanocapsules

c) Transdermal devices d) Osmotic pumps.

viii) The concept of chronopharmaceutics is based on

a) Repeat release b) Circadian Rhythm

c) Both of these d) None of these.

ix) Which of the following is true for Fick's first law of diffusion ?

a) Refers to the non steady-state flow

b) The amount of material flowing through a unit cross-section of a barrier in unit time is known as the concentration gradient

c) Flux of material is proportional to the concentration gradient

d) Diffusion occurs in the direction of increasing concentration.

x) Which equation describes the rate of drug dissolution from a tablet ?

a) Fick's law

b) Henderson-Hasselbalch equation

c) Michaelis-Menten equation

d) Noyes-Whitney equation.

xi) Dose-dumping in controlled release formulation causes

a) sustained action b) increased toxicity

c) slowing of action d) increased metabolism

xii) Tortuosity and porosity consideration is relevant in

a) drug release by diffusion

b) drug release by dissolution

c) drug release by erosion

d) none of these.

GROUP – B

(Short Answer Type Questions)

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

2. Explain various types of Transdermal therapeutic systems with suitable diagrams.

3. Write a short note on permeation enhancers in transdermal delivery.

4. What are Nanoparticles ? Discuss their application as novel delivery systems.

5. Classify implantable drug delivery systems. Briefly explain their limitations.

6. Write a note on Elementary osmotic pump.

7. Describe the kinetics of drug release from Microreservoir-Dissolution-Controlled drug delivery system.

GROUP – C

(Long Answer Type Questions)

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

8. a) Discuss the problems encountered in delivery of therapeutic proteins and peptides.

   b) Add a note on non-invasive means of protein delivery.

10 + 5

9. a) Enlist various drug targeting strategies.

   b) Explain in details the brain specific drug delivery systems. 5 + 10

10. a) Briefly discuss the various pharmacokinetic considerations in design of CR drug delivery systems.

    b) Assuming a one-compartment disposition, explain and derive the expressions for determining the zero-order drug delivery rate for a sustained release system.

$7\frac{1}{2} + 7\frac{1}{2}$

11. a) Discuss the special status of liposomes in novel drug delivery.

    b) Mention with suitable explanations the limitations of liposomes.

12. a) Classify the Bio-adhesive polymers with suitable example of each class.

b) What are the factors affecting the mucoadhesion ?

7 + 8

13. a) What is the mechanism and drug release kinetics from Matrix Diffusion Controlled drug delivery system ?

b) Give an example of such system with fabrication technique and diagram.

c) Discuss in brief about the theories of Bio-adhesion.

6 + 5 + 4