Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/B.PHARM (NEW)/SEM-6 /PT-611/2012

2012

PHARMACEUTICS
(BIO PHARMACEUTICS AND PHARMACOKINETICS)

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) Renal clearance value 130 indicates the

      a) drug is filtered only

      b) drug is filtered and reabsorbed completely

      c) drug is filtered and reabsorbed partially

      d) none of these.

   ii) Complexation can decrease bioavailability of the drug

      a) ergotamine tartrate caffeine complex

      b) caffeine-PABA complex

      c) EDTA-Ca/Mg complex

      d) Tetracycline Ca/Mg complex.

iii) HSA binding site-II is called

a) Tamoxifen binding site

b) Digitoxin binding site

c) Warfarin binding site

d) Diazepam binding site.

iv) Kinetic of protein drug binding is determined by the

a) Scatchard plot b) Craig plot

c) Sigma plot d) Cartesian plot.

v) Which one of the following is an appropriate permeation enhancer ?

a) H_2O b) CCl_4

c) DMSO d) none of these.

vi) Drug Pka is determined by the

a) Partition coefficient

b) Particle size

c) Hederson-Hasselbach equation

d) Stockes law.

vii) Which form of novobiocin shows better bioavailability ?

a) Sodium salt form

b) Calcium salt form

c) Potassium salt form

d) Free acid form.

viii) Which of the following drugs shows rapid and pH independent absorption ?

a) Phenylbutazone b) Amitryptyline

c) Guanethidine d) Ethosuximide.

ix) Area under plasma level time curve after a single oral dose of propranolol hydrochloride is found to be half of the area under plasma level time curve after a single intravenous dose of the same drug. If oral dose is twice of the intravenous dose then the percentage bioavailability is.

a) 25% b) 50%

c) 75% d) 100% .

x) The influence of route of administration on drug's bioavailability is generally which of the following orders ?

a) Oral > parenteral > rectal > topical

b) parenteral > rectal > oral > topical

c) parenteral > oral > rectal > topical

d) rectal > topical > parenteral > oral.

xi) Gastric emptying is

a) the passage from liver to kidney

b) the passage from stomach to small intestine

c) the passage from duodenum to jejunum

d) the passage from caccum to colon.

xii) The area under the serum concentration time curve represents the

a) plasma half-life

b) amount of drug that is cleared by the kidney

c) amount of drug absorbed

d) amount of drug excreted in the urine.

GROUP – B

(Short Answer Type Questions)

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

2. What does area under plasma level time curve (AUC) represent ? Derive an expression for determination of AUC after extravascular administration of a drug which exhibit one compartment characteristics.

3. Discuss the Wagner-Nelson method for the estimation of *Ka* from concentration data.

4. Describe Michaelis-Menten equation to indicate kinetics of capacity limited process. Lay out a latin square crossover diagram for bioequivalence study of three formulations A, B, C in six volunteers.

5. Micronisation of hydrophobic drugs like aspirin and phenacetin results reduction in dissolution rate. Give the reasons for such reduction in dissolution rate and suggest how can this problem be encountered ?

6. Describe the mechanism of drug absorption by carrier mediated transport. What is gastric emptying ? Write the factors affecting gastric emptying.

GROUP – C

(Long Answer Type Questions)

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

7. a) What do you mean by one compartment model ? Derive an expression for plasma concentration as a function of time after extra vascular administration of a drug with none compartment characteristics and first order absorption process. Also explain about the assessment of pharmacokinetic parameters. $7\frac{1}{2}$

b) After oral administration of Paracetamol (500 mg) the equation that fits its pharmacokinetic is $C = 1 \cdot 5 \left(e^{-0 \cdot 25t} e^{-1 \cdot 5t} \right)$. Assuming one compartment kinetics, find out peak time, peak plasma concentration and plasma 1 concentration after 1 hour administration of drug. (Fraction bioavailable = 0·4) $7\frac{1}{2}$

8. a) What is protein binding of drug ? 5

b) Describe the different binding sites of HSA. 5

c) Explain the kinetic of protein drug binding. 5

9. a) Mention the physico-chemical factors that effect drug absorption. Describe how particles size polymorphism and pseudo polymorphism affect absorption of drug. 10

   b) Enumerate pH partition hypothesis and its limitations. 5

10. a) Determine first order elimination rate constant and elimination half-life a drug following one compartment model and i.v. bolus administration. 5

    b) Define the term 'clearance' how is it related to volume of distribution. 5

    c) What do you mean by Cmax and Tmax ? Write their significance and equation for measurement. 5

11. Differentiate between bioavailability and bioequivalence. What are the various factors the effect the bioavailability of the drug ? Design a single dose bioequivalence study with the help of latin square design. 2 + 8 + 5