



Name :
Roll No. :
Invigilator's Signature :

CS/B.PHARM (NEW)/SEM-6/PT-611/2011

2011

PHARMACEUTICS

(BIOPHARMACEUTICS 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 :
 $10 \times 1 = 10$
- i) Therapeutic window of a drug having very large therapeutic index is
 - a) wide
 - b) narrow
 - c) moderate
 - d) none of these.
 - ii) Dissolution rate is proportional to
 - a) effective surface area
 - b) absolute surface area
 - c) surface area
 - d) all of these
 - iii) Site III on human serum albumin is known as
 - a) Digitoxin binding site
 - b) Tamoxifen binding site
 - c) Diazepam binding site
 - d) Lamoxifen binding site.

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[Turn over



- iv) The post-infusion decline of a drug following one compartment model is
- monoexponential
 - biexponential
 - triexponential
 - Multiexponential.
- v) Mean residence Time (MRT) is equal to
- $\frac{AUC}{AUMC}$
 - $\frac{AUMC}{AUC}$
 - $\frac{AUC}{MSC}$
 - none of these.
- vi) The maximum value of extraction ratio is
- 0.7
 - 0.99
 - 0.9
 - 1.0.
- vii) Solubility of amorphous form of a drug is
- less than its crystalline form
 - more than its crystalline form
 - less than its hydrate form
 - same as crystalline form.
- viii) Betacyclodextrin increases the solubility of poorly soluble drug by
- Cosolvency
 - Solubilisation
 - Inclusion complexation
 - Chemical modification.
- ix) Which type of drugs can cross blood brain barrier rapidly ?
- Low o/w coefficient
 - Non-polar
 - Polar
 - High o/w coefficient.
- x) Absorption of drugs from transdermal route follows
- active transport
 - passive diffusion
 - endocytosis
 - facilitated diffusion.



- xi) Gastric emptying time means
- the time required for the gastric contents to empty into small intestine
 - the time taken for half the stomach contents to empty out
 - the speed at which the stomach contents empty into the intestine
 - none of these.
- xii) Plasma volume is determined by the use of which marker ?
- Evans blue
 - Cr-51
 - Mannitol
 - None of these.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

- Explain why in vivo drug dissolution is always faster than in vitro drug dissolution.
- Lay out a Latin square crossover diagram for bioequivalency study on three formulations A, B and C in six volunteers.
- What are the differences between facilitated diffusion and active transport ?
- Write any one method for determination of K_E from Urinary excretion data.
- Name the specialized barriers to distribution of drugs. Describe the anatomy and physiology of blood brain barrier.



GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

7. What is compartment modelling ? Describe the advantages & disadvantages of compartment modelling. Explain the pharmacokinetic parameters in the intravenous infusion of one compartment open model. $2 + 5 + 8$
8. a) Discuss Wagner-Nelson method for the estimation of K_a from plasma concentration time data.
b) The half-life of propranolol in a 60 kg patient is 4 hours and V_d is 5.5 litre/kg. Determine the total systemic clearance of the drug. What will be its real clearance if fraction excreted unchanged in urine is 0.047 ? $8 + 7$
9. a) What are the causes of non-linear pharmacokinetics ?
b) Describe the Michaelis-Menten equation to indicate kinetics of capacity limited process.
c) What are the Hanes-Woolf plot and Woolf - Augustinsson - Hofstee plot. $5 + 6 + 4$
10. Explain the following :
a) pH-partition hypothesis of drug absorption.
b) Interohepatic circulation
c) Human Serum Albumin considered a versatile protein for drug binding. $5 + 5 + 5$
11. a) Explain the mechanism of renal clearance.
b) Write a note on the Extraction ratio.
c) Explain the concept of the apparent volume of distribution.
d) Differentiate between bioavailability and bioequivalence. $5 + 4 + 4 + 2$