Graphic Era HILL UNIVERSITY
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Sessional I (Even) Semester Examination, March 2025

Roll no.....
Name of the Course and semester: B. Pharm, VI semester
Name of the Paper: Biopharmaceutics and Pharmacokinetics
Paper Code: BP 604T
Time: 1.5-hour **Maximum Marks: 30**

Note:
(i) This question paper contains three sections.
(ii) All the questions are compulsory.

Section-A

I. Multiple Choice Questions

1. Which of the following parameters best describes the time taken for 50% of the drug to be eliminated from the body? **(CO1)**
   a) Clearance (Cl)
   b) Volume of distribution (Vd)
   c) Half-life (t1/2)
   d) Bioavailability (F)

2. A drug with a bioavailability (F) of 0.5 means that: **(CO2)**
   a) 50% of the drug is eliminated before reaching systemic circulation
   b) 50% of the drug undergoes metabolism in the liver
   c) 50% of the drug reaches systemic circulation in its active form
   d) The drug undergoes enterohepatic recycling

3. Which of the following is a characteristic of a drug that follows non-linear pharmacokinetics? **(CO1)**
   a) Constant half-life regardless of dose
   b) Dose-dependent elimination
   c) Proportional increase in plasma concentration with dose increase
   d) Linear first-order elimination at all concentrations

4. Which pharmacokinetic parameter determines the extent of drug distribution in the body? **(CO2)**
   a) Half-life (t1/2)
   b) Volume of distribution (Vd)
   c) Clearance (Cl)
   d) Bioavailability (F)

5. What is the formula for calculating bioavailability (F) from plasma concentration-time data? **(CO1)**

a) $(AUC_{oral} / AUC_{IV}) \times 100$
b) (C_{max} / T_{max})
c) Dose / Clearance
d) $(K_{el} \times t_{1/2})$

6. Which of the following statements about plasma protein binding is true? **(CO2)**

a) Highly protein-bound drugs have a higher volume of distribution
b) Drugs bound to plasma proteins are pharmacologically active
c) Only the free (unbound) drug is available for distribution and action
d) Plasma protein binding has no effect on drug elimination

7. Which of the following is NOT a mechanism of drug absorption? **(CO1)**

a) Phagocytosis
b) Pinocytosis
c) Endocytosis
d) Exocytosis

8. Which of the following statements is true regarding first-pass metabolism? **(CO2)**

a) It increases the bioavailability of the drug
b) It occurs mainly in the kidneys
c) It leads to a decrease in the amount of drug reaching systemic circulation
d) It is more common for intravenous drugs

9. Which of the following statements is true regarding zero-order kinetics? **(CO1)**

a) A constant percentage of drug is eliminated per unit time
b) Drug elimination rate is independent of drug concentration
c) Most drugs follow zero-order kinetics at therapeutic doses
d) Zero-order kinetics is also called first-order elimination

10. Which of the following statements about drug clearance is true? **(CO2)**

a) Clearance is dependent only on renal excretion
b) Clearance represents the volume of plasma completely cleared of drug per unit time
c) Clearance is inversely proportional to the elimination half-life
d) Clearance is equal to the rate of drug elimination divided by the total drug in the body

Section-B

Short type (attempt any two out of three) **2×5= 10**

a) Differentiate plasma protein drug binding and extravascular protein drug binding. **(CO2)**
b) Write a short note on Biopharmaceutical Classification System. **(CO1)**

c) Explain about diffusion layer theory of dissolution. **(CO1)**

Section-C

Long type (attempt any one out of two) **1×10= 10**

a) Define Bioequivalence according to Part 320, Chapter 1 of CFR. Explain about measurement of bioavailability. **(CO2)**

b) What is sink condition? Write about factors affecting absorption. **(CO1)**