JHARKHAND Rai University RANCHI

End Semester/Reappear (Semester VI) Examination May 2025

Programme: B. Pharm
Course: Biopharmaceutics and Pharmacokinetics **Full Marks: 75**
Course Code: BP604T **Time: 3 Hrs.**
Enrolment no. _____

Q.No.	Questions	CO	Bloom Taxonomy Category	Marks
	Section I			
1	**Objective Type Questions**			**1 x 20 = 20**
	i.Non-oral extravascular routes of absorption include all except: a. Sublingual b. Intravenous c. Rectal d. Intramuscular ii.High protein binding usually results in: a. Increased clearance b. Decreased free drug concentration c. Faster elimination d. Lower half-life iii.Phase I metabolism usually involves: a. Conjugation b. Oxidation and reduction c. Sulfation d. Glucuronidation iv. Absolute bioavailability compares: a. IV and oral dosage b. Two oral formulations c. Two brands d. Two different routes of injection v. Which method enhances drug solubility? a. Reducing pH b. Reducing surface area c. Micronization d. Inhibition of metabolism	CO1	Remember	
	vi.Which route does not involve absorption phase? a. Oral b. IM c. IV bolus d. Sublingual vii.In a two-compartment model, drug initially distributes to: a. Lungs b. Peripheral tissue c. Central compartment d. Renal tubules viii. A loading dose is required to: a. Delay steady state b. Maintain plasma concentration c. Quickly achieve therapeutic levels d. Reduce drug toxicity ix.Nonlinear pharmacokinetics is also known as: a. Dose-independent kinetics b. Saturable kinetics c. Constant-rate kinetics d. Simple kinetics x.The maintenance dose is used to: a. Reach peak level b. Maintain steady state c. Eliminate drug d. Delay metabolism			
	xi.Which parameter does not influence loading dose? a. Clearance b. Bioavailability c. Volume of distribution d. Target concentration xii.A major cause of nonlinearity is: a. Constant absorption b. Protein binding saturation c. Simple diffusion d. High blood flow xiii.Which drug commonly shows nonlinear pharmacokinetics? a. Penicillin b. Phenytoin c. Paracetamol d. Ibuprofen xiv.Nonlinear kinetics complicates: a. Formulation b. Dosing regimens c. Bioavailability studies d. Pharmacodynamics xv. Bioequivalence studies are essential for: a. OTC drugs only b. Generic drug approval c. Herbal supplements d. Controlled substances			
	xvi.Which is a non-renal route of drug excretion? a. Bile b. Urine c. Glomerular filtration d. Tubular secretion xvii.Which model measures drug dissolution in vitro? a. Compartmental model b. Paddle method c. One-compartment model d. Linear regression model xviii.Which is NOT a type of pharmacokinetic model? a. Compartment model b. Physiological model c. Statistical model d. Non-compartment model xix.The absorption rate constant (Ka) is used in: a. Elimination studies b. Zero-order kinetics c. Oral drug absorption d. IV bolus xx.The purpose of compartment modeling is to: a. Simulate drug structure b. Predict ADME c. Optimize formulation onlyd. Study bioequivalence			

Section II				
2. Short Answer type questions.				**7 x 5 = 35**
a	"In-vitro dissolution is always slower than in-vivo dissolution." Explain.	CO1	Apply	
b	Illustrate the in vitro drug dissolution testing models.	CO2	Apply	
c	Explain the Sigma minus method for K_E determination	CO3	Remember	
d	Design a dosage regimen using a two-compartment model for a drug that requires quick onset and sustained effect.	CO4	Apply	
e	Explain how enzyme saturation leads to non-linear pharmacokinetics.	CO5	Understand	
f	Draw the schematic diagram for the two-compartment open model (i) intravenous administration (ii) extravascular administration	CO4	Understand	
	or			
	What is the clinical importance of multiple dosing?	CO4	Understand	
g	Explain Michaelis Menten equation.	CO5	Understand	
	or			
	What are the causes of non-linear pharmacokinetics?	CO5	Understand	
Section III				
Long Answer Type questions				**2 x 10 = 20**
3	Prove the equation: $\log C = \log C_0 - K_E t/2.303$	CO3	Create	
	or			
	Describe the one-compartment open model with IV bolus administration.	CO3	Evaluate	
4	Create a step-by-step guide to calculate steady-state concentration for a drug administered via multiple IV bolus doses.	CO4	Create	
	or			
	How are loading and maintenance doses have to be calculated? Discuss their clinical significance?	CO4	Evaluate	

Course Outcomes (CO):

CO1: To understand the mechanisms of drug absorption through GIT, factors influencing drug absorption through GIT, and the details of protein binding

CO2: To understand the detailed elimination pharmacokinetics and the details of bioavailability and bioequivalence study

CO3: To understand about pharmacokinetics, compartmental modelling, physiological modelling and details of one-compartment open models.

CO4: To understand Multicompartment models and details of the two-compartment open model.

CO5: To understand the details of Nonlinear Pharmacokinetics