DEPARTMENT OF PHARMACEUTICAL SCIENCES & TECHNOLOGY

BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(Internal Assessment I)

CLASS: BPHARM **SEMESTER: VI**
BRANCH: PHARMACY **SESSION: SP 2025**

SUBJECT: BP604T BIOPHARMACEUTICS & PHARMACOKINETICS

TIME: 2.00 Hour **FULL MARK: 30**

PART I

A. Objective type questions (Answer all questions) (5 x 02 = 10 marks)

1. Write down the relation between apparent volume of distribution and amount of drug present in the body.
2. Write down the assumptions to be considered while developing one compartment pharmacokinetic model for intravenous single dosage administration.
3. Write down the formula to calculate steady state concentration after IV infusion administration following one compartment pharmacokinetic model.
4. Explain Diffusion layer model theory of drug dissolution.
5. Enlist various physicochemical factors influencing the gastrointestinal (GI)absorption of a drug from its dosage form.

PART II

B. Long Answers (Answer any one out of two) (01x10=10 marks)

1. Develop the equation to estimate the time at which a peak plasma concentration of drug should be observed and the maximum plasma concentration at this time following first-order input into the body after extra vascular administration following one compartment pharmacokinetic model.
2. Explain how the dosage form characteristics and pharmaceutical ingredients influence the gastrointestinal (GI) absorption of a drug?

PART III

C. Short Answers (Answer any two out of three) (02x05=10 marks)

1. Determine the elimination rate constant using the declining drug concentration in plasma versus time data collected after stopping the infusion in case of IV infusion administration following one compartment pharmacokinetic model.
2. If drug concentrations versus time data are obtained during as well as after constant rate intravenous infusion, calculate systemic clearance (Cl_s) and apparent volume of distribution (V) from the total area under the concentration versus time curve while following one compartment pharmacokinetic model.
3. Give a detailed discussion on the different mechanisms of drug absorption across biological membranes

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