

BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, PILANI
FIRST SEMESTER 2022-2023
PHA G612: Pharmacokinetics and clinical pharmacy

Mid-term Examination

Maximum marks: 30
Date: 04/11/2022

Weightage: 30%
Duration: 90 min

Note:

- Please follow all the *Instructions to Candidates* given on the cover page of the answer book.
- All parts of a question should be answered consecutively.
- Each answer should start from a fresh page.
- Assumptions made if any, should be stated clearly at the beginning of your answer.

No. of Pages	= 1
No. of Questions	= 7

Q1. A drug is having a half-life of 2.5 h. It was given via IV infusion at a rate of 2 mg/h. Determine the time at which it reaches its practical steady state. [3 M]

Q2. Derive the formula for a time to reach maximum concentration, when a drug was given via oral route. [3 M]

Q3. Justify the following: [4 M]
a. Sampling in a pharmacokinetic study should be done for at least 4.32 half-lives of the drug.
b. Negative lag time was observed after oral administration of a drug.

Q4. Following data was obtained after intravenous infusion of a drug at a rate of 3 mg/min. Determine the loading IV bolus dose required to achieve the steady state instantaneously. [5 M]

Time (h)	0.5	1	2	4	6	12	18	24
Concentration ($\mu\text{g/ml}$)	2	12	28	42	48	53.5	54	54

Q5. Explain the rate of excretion method to determine the pharmacokinetic parameters. [5 M]

Q6. How can we determine A, B, α and β for a drug that follows two compartment model, when given intravenously? [5 M]

Q7. A drug was given at a dose of 50 mg intravenously. Given the half-life of the drug is 3.5 h, volume of distribution is 10.1 L and minimum effective concentration is 1.5 $\mu\text{g/ml}$. Determine the following: [5 M]

- a. Duration of action
- b. Dose to be given so that the duration of action is doubled

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