BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

CLASS: M. Pharm.   SEMESTER: II
BRANCH: PHARMACEUTICS   SESSION: SP2022
SUBJECT: Advanced Biopharmaceutics and Pharmacokinetics (MPH202T)
TIME: 3.00 Hours   FULL MARK: 75
INSTRUCTIONS:
1. The missing data, if any, may be assumed suitably.
2. Before attempting the question paper, be sure that you have got the correct question paper.
3. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
4. Attempt any Five out of Seven

1a.	Differentiate between passive and active diffusion of drug from gastro-intestinal tract.	[7]
1b.	Develop 'level A' *in vitro* and *in vivo* correlation (IVIVC) for BCS class I drug	[8]
2a.	Design a parallel and crossover bioequivalence study for test drug 'A' and reference drug 'B'	[7]
2b.	Examine Fick's law of diffusion and discuss various parameters associated to improve dissolution of drug.	[8]
3a.	Investigate the influence drug's pKa and Gastrointestinal pH in drug absorption from GI tract.	[7]
3b.	Explain pharmacokinetic method to assess bioequivalence study.	[8]
4a.	Derive double reciprocal equation to estimate association constant and number of binding sites on protein molecule.	[7]
4b.	Using suitable example defend the statement "Apparent volume of distribution has no true anatomical or physical volume relation".	[8]
5a.	Discuss challenges in executing pharmacokinetics study of biopharmaceutical products.	[7]
5b.	Develop a method with illustration to prepare monoclonal antibodies.	[8]
6a.	Derive an equation to estimate area under the curve of plasma concentration time plot for a drug given orally.	[7]
6b.	A 70-kg volunteer is given an intravenous dose of an antibiotic, and serum drug concentrations were determined at 4 hours and 8 hours after administration. The drug concentrations were 2.5 and 1.25 mcg/mL, respectively. Calculate Elimination rate constant (KE) and biologic half-life for this drug, assuming first order elimination kinetics?	[8]
7a.	Derive a method to estimate absorption rate constant and elimination rate constant using method of residuals when the drug is given orally that confers one compartment model (Assume Ka>>KE)	[7]
7b.	Investigate various cases in Nonlinear Pharmacokinetics that result in different order of kinetics in Michaelis-Menten curve.	[8]

:::::27/04/2022:::::