Time: 3 hours **Max marks: 70**

Please check whether you have got the right question paper.

N.B.: (1.) All questions are compulsory
(2.) Figures to the right indicate full marks
(3.) Use of scientific calculator is permitted

Q.1		Answer the following:	
	a.	Differentiate between Bioavailability and Bioequivalence.	**2**
	b.	What are the transmucosal routes of drug administration? Give their advantages.	**2**
	c.	Why do some drugs have a Vd less than their true volume of distribution?	**1**
	d.	What is meant by non-competitive inhibition of an enzyme.	**2**
	e.	Define 'biliary clearance'	**2**
	f.	Give the basis of BCS classification of drugs.	**2**
	g.	What is compartmental modelling?	**2**
	h.	How is absolute bioavailability calculated?	**2**
Q.2	a.	Write a note on carrier-mediated transport of drugs.	**4**
	b.	How do the solubility and dissolution rate of a drug affect its absorption?	**4**
	c.	Explain the effect of food and its interactions that affect absorption of a drug.	**3**
Q.3	a.	Compare the bioavailability of a drug from solution and suspension dosage forms.	**3**
	b.	Discuss drug interactions due to protein-drug binding.	**4**
	c.	Discuss rate of excretion method for urine analysis after IV administration.	**4**
		OR	
		What are the causes of non-linearity in drug absorption and distribution?	**4**
Q.4	a.	Enlist Phase I reactions and describe any one briefly.	**4**
	b.	Discuss intrinsic capacity hepatic clearance.	**3**
	c.	Discuss two important factors that affect renal excretion.	**4**
Q.5	a.	Discuss the Diffusion layer model of drug dissolution.	**4**
	b.	Describe the dissolution testing I.P. using the Rotating paddle apparatus.	**3**
	c.	Discuss any four methods of bioavailability enhancement through enhancement of drug solubility.	**4**
		OR	
		What are the elements of a Bioequivalence study protocol?	**4**

TURN OVER

Q.6 a. Derive equations to estimate elimination rate constant, elimination half- life and clearance following an IV bolus administration. **4**

OR

How will you determine absorption rate constant by method of residuals? **4**

b. A drug following one compartmental kinetics was given as an intravenous bolus dose of 60 mg. The equation describing its plasma profile is

$$C = 22\ e^{-0.04t}$$

Calculate:

i.)	Half-life and Volume of distribution	**1**
ii.)	Total clearance of the drug and AUC(zero to infinity)	**1**
iii.)	Amount remaining in the body after 8 hours	**1**
iv.)	Plasma concentration 9 hours after drug administration	**2**
v.)	Time required to eliminate 60% of the dose	**2**
