Total No. of Questions: 3 *Total No. of Printed Pages:2*

Enrollment No.....

Faculty of Pharmacy

End Sem (Even) Examination May-2022

PY3CO26 Biopharmaceutics & Pharmacokinetics

Programme: B. Pharma Branch/Specialisation: Pharmacy

Duration: 3 Hrs. **Maximum Marks: 75**

Note: All questions are compulsory. Internal choices, if any, are indicated.

Q.1	i.	Enlist mechanisms for absorption of the drug from GIT.	**2**
	ii.	Explain the term 'apparent volume of distribution'.	**2**
	iii.	Differentiate Phase -I with Phase -II metabolic reactions pathway.	**2**
	iv.	Briefly describe levels of in-vitro in-vivo correlations (IVIVC).	**2**
	v.	Briefly describe the physiological model.	**2**
	vi.	Define terms: Duration of Action and Therapeutic window.	**2**
	vii.	Differentiate the catenary model with the mammillary model.	**2**
	viii.	Define Loading dose and Maintenance dose.	**2**
	ix.	Discuss the importance of V_{max} in Michaelis-mention equation.	**2**
	x.	Discuss the importance of K_m in Michaelis-mention equation.	**2**
Q.2		Attempt any two:	
	i.	Enlist factors affecting drug absorption and describe physiological and pharmaceutical factors in detail.	**10**
	ii.	Define Bioavailability and Bioequivalence. Describe a study design with protocol for conduct of BA-BE study.	**10**
	iii.	(a) Describe plasma protein binding and discuss its impact.	**5**
		(b) Write a brief note on various pathways for renal clearance.	**5**
Q.3		Attempt any seven: Two questions from each section is compulsory.	
		Section – A	
	i.	Describe the non-compartment model and the concept of Mean Residence Time (MRT).	**5**
	ii.	Discuss steady-state concentration and its relation with infusion rate. Give impact of simultaneous injection with an infusion.	**5**

P.T.O.

	iii.	Explain any one method to determine the absorption rate constant for drugs following one-compartment model.	**5**
		Section – B	
	iv.	Write a note on the pharmacokinetics for intravenous injection of drug following two-compartment model.	**5**
	v.	Discuss the effect of 'Dose-size' and 'Dose frequency' for multiple dosage regimen.	**5**
	vi.	Discuss factors affecting the pharmacokinetics of a drug.	**5**
		Section - C	
	vii.	How will you detect non-linearity in pharmacokinetics?	**5**
	viii.	Describe factors causing non-linearity in pharmacokinetics.	**5**
	ix.	Describe any two methods to determine V_{max} and K_m.	**5**

******

Marking Scheme
PY3CO26 Biopharmaceutics & Pharmacokinetics

Q.1	i.	Mechanisms for absorption of the drug	2 marks	**2**
	ii.	Apparent volume of distribution	2 marks	**2**
	iii.	Phase -I with Phase -II	2 marks	**2**
	iv.	Levels of in-vitro in-vivo correlations	2 marks	**2**
	v.	Physiological model	2 marks	**2**
	vi.	Duration of Action and Therapeutic window	2 marks	**2**
	vii.	Catenary model with the mammillary model	2 marks	**2**
	viii.	Loading dose and Maintenance dose	2 marks	**2**
	ix.	Importance of V_{max} in Michaelis-mention equation	2 marks	**2**
	x.	Importance of K_m in Michaelis-mention equation	2 marks	**2**
Q.2		Attempt any two:		
	i.	Factors affecting drug absorption	2 marks	**10**
		Physiological factors	4 marks	
		Pharmaceutical factors	4 marks	
	ii.	Bioavailability	2 marks	**10**
		Bioequivalence	2 marks	
		Study design (3 marks * 2)	6 marks	
	iii.	(a) Definition, kinetics equation	3 marks	**5**
		Applications of PPB shidies on ADME	2 marks	
		(b) Various pathways for renal clearance.		**5**
		As per explanation		
Q.3		Attempt any seven: Two questions from each section is compulsory.		
		Section – A		
	i.	Non-compartment model	3 marks	**5**
		Mean Residence Time (MRT), Graph	2 marks	
	ii.	Steady-state concentration and its relation	2 marks	**5**
		Simultaneous injection with an infusion	3 marks	

P.T.O.

	iii.	Any one method	3 marks	**5**
		Graphical method	2 marks	
		Section – B		
	iv.	Injection two-compartment model	3 marks	**5**
		Graphical methods	2 marks	
	v.	'Dose-size'	2.5 marks	**5**
		'Dose frequency'	2.5 marks	
	vi.	Factors affecting ADME	5 marks	**5**
		As per explanation		
		Section - C		
	vii.	Detection of Non-linearity in pharmacokinetics		**5**
		As per explanation		
	viii.	Factors causing non-linearity in pharmacokinetics.		**5**
		As per explanation		
	ix.	Any two methods to determine V_{max} and K_m.		**5**
		(2.5 marks * 2)		

******