Name:

Enrolment No:

UPES
End Semester Examination, May 2024

Course: Applied Pharmacokinetics and Principles of Drug Dosing **Semester : VI**
Program: Int. (B. Sc. + M. Sc. (Clinical Research)) **Time : 03 Hours.**
Course Code: HSCR3021P **Max. Marks: 100**

Instructions:

Section A

Short answer questions/ MCQ/T&F
(20Qx1.5M= 30 Marks)

S. No.		30 Marks	CO
Q 1	Define active diffusion.	**1.5**	**CO1**
Q 2	Enlist any three factors affecting drug absorption.	**1.5**	**CO1**
Q 3	If the dosing rate is doubled, the C_{ss} will remain constant. A. True B. False	**1.5**	**CO1**
Q 4	Identify from the following route of administrations that lacks "Permeation of drug" step. A. Oral B. Transdermal C. Intra-ocular D. Intra-venous	**1.5**	**CO1**
Q 5	The beginning of pharmacologic response is called as_____. A. Onset of action B. Onset time C. Duration of action D. Drug is slowly eliminated from body	**1.5**	**CO1**
Q 6	$K_E \times AUC =$ _____. A. C_0 B. C_{ss} C. $T_{1/2}$ D. V_d	**1.5**	**CO1**
Q 7	The drug-drug interactions need to be considered while prescribing combination therapy. A. True B. False	**1.5**	**CO2**
Q 8	Renal impairment results in the decrease in _____. (Select all possible options) A. Renal excretion rate B. Renal clearance C. Glomerular filtration rate D. Biliary excretion rate	**1.5**	**CO2**
Q 9	Name any two conditions that can cause renal failure.	**1.5**	**CO2**
Q 10	If the GFR of the patient is less than 15 ml/minute per 1.73 m^2, he/she should be diagnosed with _____. A. Renal Failure B. Mild kidney failure C. Hepatic failure D. Cardiac failure	**1.5**	**CO2**
Q 11	Sate any two parameters used to estimate liver function.	**1.5**	**CO2**

Q 12	The i.v. bolus dosage is 500 mg and the plasma drug concentration is 0.4 µg/ml. Estimate the volume of distribution? A. 1250 mg/mL B. 1250 L C. 1250 mL D. 0.0008 L	**1.5**	**CO3**
Q 13	Define maintenance dose.	**1.5**	**CO3**
Q 14	Greater the dose size, less will be the fluctuation in drug concentration during each dosing interval. A. True B. False	**1.5**	**CO3**
Q 15	State the formal for estimation of accumulation index in multiple dose regimen.	**1.5**	**CO3**
Q 16	Illustrate the effect of dose size on plasma concentration-time profile after oral administration of a drug at fixed intervals by a well labelled graph.	**1.5**	**CO3**
Q 17	State the purpose of population pharmacokinetic modeling.	**1.5**	**CO4**
Q 18	Individual pharmacokinetics studies are generally conducted at later stages of clinical studies. A. True B. False	**1.5**	**CO4**
Q 19	The basic principle of therapeutic drug monitoring is to measure_____.	**1.5**	**CO5**
Q 20	Explain the term "Pharmacodynamic monitoring".	**1.5**	**CO5**
Section B (4Qx5M=20 Marks)			
Q	Short Answer Type Question	**20 Marks**	**CO**
Q 1	Write a short note on renal clearance.	**5**	**CO1**
Q 2	Describe the population pharmacokinetics.	**5**	**CO4**
Q 3	Explain catenary model of pharmacokinetics.	**5**	**CO1**
Q 4	Discuss the term therapeutic drug monitoring.	**5**	**CO5**
Section C (2Qx15M=30 Marks)			
Q	**Two case studies 15 marks each subsection**	**30 Marks**	**CO**
Q 1	If the plasma concentration of antibiotic after IV bolus administration was found to be 20.0 and 11 µg/mL at 4 and 8 hours, respectfully. By assuming one compartment open model, calculate following parameters: a) The elimination rate constant (3 marks) b) half-life of the drug (2 marks) c) Concentration of drug at zero time (4 marks) d) Volume of distribution if dose is 600 µg (3 marks) e) Total systemic clearance (3 marks)	**15**	**CO3**
Q 2	Diltiazem is administered in a dose of 60 mg q.i.d. The oral bioavailability of the drug is 50%, Vd is 30L and elimination half-life is 4 hrs. a) Determine maximum and minimum amounts of drug in the body after 4 doses. (4 marks) b) Calculate maximum and minimum amounts if drug in the body at steady state (4 marks) c) Estimate the accommodation index? (2 marks)	**15**	**CO3**

	d) Calculate average amount of drug in the body at steady state (3 marks) e) If the dose is given as 120 mg b.i.d., calculate new $C_{ss.av.}$ (2 marks)		
	Section D **(2Qx10M=20 Marks)**		
Q	Long Answer type Questions	**20 Marks**	**CO**
Q 1	Explain in detail the one compartment open model for IV infusion.	**4+6**	**CO1**
Q 2	Write a short note on dose adjustment in hepatic and renal failure.	**1+9**	**CO2**