Name: Enrolment No:		UPES UNIVERSITY OF TOMORROW

Course: Biopharmaceutics and Pharmacokinetics   Semester : VI
Program: B. Pharmacy   Duration : 03 Hours
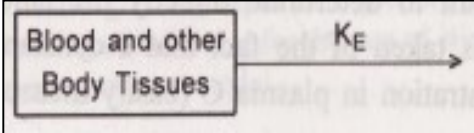Course Code: BP604T   Max. Marks: 75

Instructions: Read all the questions carefully. Follow the instructions mentioned against each section.

SECTION A
(20Qx1M=20 Marks)

S. No.		Marks	COs

Q 1	If drug Y has 10 times more affinity to plasma proteins than drug X, which of the following statement is true for drug Y?
	
	  A. Apparent volume of distribution of drug Y does not change.
	  B. Free drug concentration of drug Y in blood will decrease.
	  C. Apparent volume of distribution of drug Y increase.
	  D. Toxicity of drug Y increase.
			CO1

Q 2	Define active diffusion.		CO1
Q 3	Weakly acidic drugs are extensively absorbed from stomach. A. True B. False		CO1

Q 4	Drugs with molecular weight less than 10000 D can easily cross through_____.
	
	  A. Blood-brain barrier B. Cell membrane
	  C. Blood-CSF barrier D. Placental barrier
			CO1

Q 5	Total body water volume is supposed to be _____ liters.
	
	  A. 24 B. 42
	  C. 12 D. 36
			CO1

Q 6	State the name of biomarker used for determination of GFR.		CO2
Q 7	Define bioavailability.		CO2
Q 8	Glucuronidation is a Phase II biotransformation reaction. A. True B. False		CO2
Q 9	Enlist any two process involved in urine formation.		CO2
Q 10	Induction of metabolizing enzymes may precipitate toxicity of some drugs. A. True B. False		CO2
Q 11	Sate any one method used for determination of absorption rate constant.		CO3

Q 12	What does the word "open" mean in the one compartment open model?
	
	  A. Unidirectional input and output B. The drug easily enters in compartment
	  C. The drug readily mixes with the blood D. Easy absorption
			CO3

Q 13	State the parameter which explains about the rate and extent of absorption of the drug.		CO3

Q 14	Identify the model depicted in given figure. A. One compartment open model for IV bolus administration B. One compartment open model for IV infusion C. One compartment open model for IV extravascular administration D. One compartment open model for IV loading dose + IV infusion		CO3
Q 15	In mammillary model, the compartments are assumed to be arranged in series. A. True B. False		CO3
Q 16	Sate the formula for estimating loading dose for IV administration.		CO3
Q 17	Dissolution Apparatus with basket is known as _____, as per USP. A. Type I B. Type II C. Type III D. Type IV		CO4
Q 18	Define bio-equivalence.		CO4
Q 19	State any one example of non-linear kinetics observed in metabolism.		CO5
Q 20	In Michaelis-Menton Equation, when the value of Km <<<C, rate of the process is half of the maximum rate. A. True B. False		CO5

SECTION B (20 Marks)
(2Qx10M=20 Marks)
Attempt 2 Question out of 3

Q 1	a. Explain the concept of volume of distribution. b. Write a short note on absorption of the drug from any one of the extravascular route of administration.	5+5	CO1
Q 2	A 70 kg of patient is administered with a drug by IV infusion. The drug has plasma half-life of 22 hours, apparent Vd of 15.7 liters and desired steady state level plasma concentration of 0.0002 µg/mL. By assuming one compartment open model, calculate following parameters: a) Time required to reach 90% of Css (2 marks) b) Infusion rate to achieve Css (3 marks) c) Loading dose to achieve Css rapidly (2 marks) d) The concentration of drug after 2 half-lives of drug (3 marks) e) Comment on the drug distribution in the body (1 marks)	10	CO3
Q 3	Discuss in detail the factors affecting the renal clearance.	10	CO2

SECTION-C (35 Marks)
(7Qx5M=35 Marks)
Attempt 7 Question out of 9

Q 1	Explain the non-linearity observed in absorption and distribution phase with proper examples.	5	CO5
Q 2	Define conjugation reaction in biotransformation. Elaborate with the help of any two examples.	1+4	CO2
Q 3	If the drug is poorly soluble. Suggest any two methods to enhance its bioavailability.		CO2
Q 4	Define: Onset of action, duration of action, C_{max}, therapeutic range.	4+1	CO3

	Draw a graph with and label above parameter.		
Q 5	Differentiate between active and passive diffusion.		CO1
Q 6	Define loading dose and maintenance dose. State their significance.	2+3	CO4
Q 7	Write a short note on Michaelis-Menten equation and derive equation for its three conditions.	5	CO5
Q 8	Discuss the central and peripheral compartment in two-compartment model with example. Draw a pharmacokinetic profile of drug for IV bolus two compartment open model.	4+1	CO4

Q 9	The Volume of distribution of fluoxetine is 3000 liters. Calculate the following parameters.
	   a. The amount of drug in the body if the plasma concentration is 1 ng/ml.
	   b. The percentage of the drug that is present in plasma.
		3+2	CO3