UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, May 2022

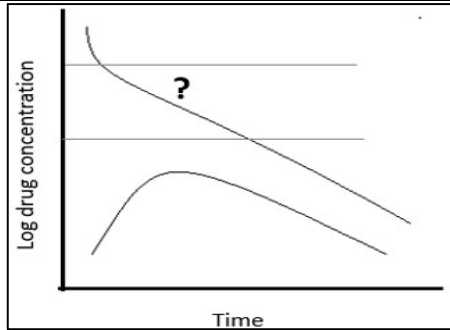|	
Course: Biopharmaceutics and Pharmacokinetics	**Semester: VI**
Program: B. Pharm.	**Time: 03 h.**
Course Code: BP 604 T	**Max. Marks: 100**

Instructions: All the sections are compulsory.

SECTION A

S. No.	CO		Marks
		Answer all the questions.	**20**
1.	**CO1**	Which is the major process of absorption for more than 90% of drugs? 　A. Facilitated diffusion　　　　　B. Absorption diffusion 　C. Passive diffusion　　　　　　　D. Pinocytosis	**1**
2.	**CO1**	Which one of the following is a critical rate-limiting step of drug absorption of poorly soluble drugs? 　A. Rate of dissolution　　　　　B. Rate of permeation 　C. Size of the drug　　　　　　　D. Rate of drug release	**1**
3.	**CO1**	Fick's law is used to explain_____ . 　A. Dissolution rate　　　　　　　B. Disintegration rate 　C. Diffusion rate　　　　　　　　D. Dissociation rate	**1**
4.	**CO1**	During pregnancy, drug distribution is more. Which of the following sentences describe the given fact better? 　A. The baby needs more drug 　B. The mother needs more drug due to high metabolism 　C. The surface area increases in the mother's body due to the presence of uterus, placenta, and foetus. 　D. The growth of the uterus, placenta, and foetus increases the volume thus increasing distribution. And even the baby forms a separate compartment for a drug to get distributed	**1**
5.	**CO1**	Which one of the following organ has a high perfusion rate? 　A. Fats　　　　　　　　　　　　B. Kidney 　C. Skin　　　　　　　　　　　　D. Bone	**1**
6.	**CO2**	Biotransformation of drugs is defined as the conversion from one physical form to another. 　A.　　True　　　　　　　B. False	**1**
7.	**CO2**	Which enzymes catalyzes the hydrolysis of amides? 　A. Esterase　　　　　　　　B. Amidase 　C. Amydase　　　　　　　　D. Aminodase	**1**
8.	**CO2**	Which one of the following is the principal organ for drug excretion? 　A. Kidney　　　　　　　　　B. Liver 　C. Lung　　　　　　　　　　D. Skin	**1**

9.	CO2	Which of the following is not a factor influencing pulmonary excretion?
		
		   A. Pulmonary blood flow B. Rate of respiration
		   C. The solubility of volatile substance D. Heart rate
			1

10.	CO2	What will be the elimination rate if the clearance is 130 ml/min and drug concentration is 0.8 g/ml?
		
		   A. 104 g/min B. 140 g/min
		   C. 130 g/min D. 100 g/min
			1

11.	CO2	Drugs of molecular range 300-500 Dalton will be excreted out by glomerulus. A. True B. False	1

12.	CO3	What is the equation to find out the apparent volume of distribution?
		
		   A. Amount of drug in the body/plasma drug concentration
		   B. Plasma drug concentration/amount of drug in the body
		   C. 1 / plasma drug concentration
		   D. 1 / Amount of drug in the body
			1
			
			C

13.	CO3	In which of the model peripheral compartments are connected to a central compartment?
		
		   A. Compartment model B. Mammillary model
		   C. Caternary model D. Physiological model
			1

14.	CO3	What is the chemical equivalence?
		
		   A. Two or more drug products contain the same labeled chemical substance in the same amount
		   B. Two or more drug products contain the same labeled chemical substance in different quantity
		   C. Two or more drug products contain different labeled chemical substance giving the same therapeutic effect
		   D. Two or more drug products contain the same labeled chemical substance giving a different therapeutic effect
			1

15.	CO3	The period for which the plasma concentration of drug remains above minimum effective concentration is known as _____.
		
		   A. Onset of time B. Duration of action
		   C. Onset of action D. Therapeutic range
			1

16.	CO3	Multiple dose study is better since we can understand the peak, valley, drug blood levels, etc. A. True B. False	1
17.	CO4	Draw a block diagram for two compartment open model extravascular administration.	1
18.	CO4	In the given picture, the marking "?" represents the drug concentration of which compartment? A. The central compartment in a two compartment model B. Peripheral compartment in a two compartment model C. The central compartment in a one compartment model D. Drug concentration of the plasma	1

19.	CO5	The characteristic of non-linear pharmacokinetics include…………..
		   A. Area under the curve is proportional to the dose
		   B. Elimination half-life remains constant
			1

		C. Area under the curve is not proportional to the dose D. Amount of drug excreted through remains constant	
20.	CO5	In Michaelis-Menton Equation, when the value of Km <<< C, rate of the process is equal to maximum rate of reaction. A. True B. False	1

SECTION B

Answer any two questions of the following.			**20**
1.	CO5	What are the causes of non-linearity found in pharmacokinetics (ADME) of drug?	10

2.	CO3	If the plasma concentration of vancomycin 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 (3 marks)
		    c) Concentration of drug at zero time (4 marks)
			10

3.	CO2	Describe any five factors affecting renal excretion with an example.	4+6

SECTION C

Answer any seven questions of the following.			**35**
1.	CO1	Differentiate active and passive transport.	5
2.	CO1	Explain the term 'volume of distribution'.	1+4
3.	CO1	Write a short note on blood-brain barrier.	5
4.	CO2	"Drug interactions can be employed for selective excretion of some drugs". Explain the statement with an example.	5

5.	CO3	Half-life of a drug in 60 kg patient is 5 hours and Vd is found to be 5 L/kg.
		    a. Determine the total systemic clearance
		    b. Determine the renal clearance if the fraction excreted unchanged in urine is 0.045.
			5

6.	CO3	Explain bioequivalence and therapeutic equivalence.	5
7.	CO2	Explain glucuronidation in biotransformation.	5
8.	CO4	How body tissues are classified considering two compartment model? In which compartment the brain should be classified.	4+1
9.	CO4	Why the rapid decline in initial concentration followed by slower decline is observed in plasma levels of the drug that follows two compartment model?	5
		Total	**75**