

Time: 3 hours

Total marks 75

Note: All Questions are Compulsory.
 Figures to the right indicate full marks.
 Draw diagrams wherever required.
 Use of Scientific calculator is permitted

Q.I	Choose the appropriate option for following multiple choice questions	20
1	Use of pharmacokinetic principles to the design, conduct and interpretation of drug safety evaluation studies	1
a	Population pharmacokinetics	
b	Clinical pharmacokinetics	
c	Therapeutic drug monitoring	
d	Toxicokinetics	
2	Absorption of Vitamin B12 from small intestine is brought about by	1
a	Active transport	
b	Passive transport	
c	Carrier mediated transport	
d	Ion pair transport	
3	BCS Class II drug molecule has	1
a	Low solubility and high permeability	
b	High solubility and high permeability	
c	Low solubility and low permeability	
d	High solubility and low permeability	
4	Following route of drug administration will exhibit maximum bioavailability	1
a	Oral	
b	Rectal	
c	Intravenous	
d	Topical	
5	_____ involves adsorptive uptake of solid particulate	1
a	Pinocytosis	
b	Phagocytosis	
c	Ion pair transport	
d	Diffusion	
6	Apparent volume of distribution is described as	1
a	correlation between dose administered and plasma concentration	
b	correlation between dose eliminated and plasma concentration	
c	correlation between rate of elimination and plasma concentration	
d	correlation between rate of absorption and plasma concentration	
7	Site II of Human Serum Albumin is referred to as _____ binding site	1
a	Warfarin	
b	Diazepam	
c	Tamoxifen	
d	Digitoxin	
8	Following is active process of urinary excretion	1
a	Glomerular filtration	

- b Tubular secretion
c Biliary secretion
d Tubular filtration
- 9 Hepatic clearance is given by: **1**
a Elimination rate X plasma drug concentration
b Hepatic excretion rate/ plasma drug concentration
c Plasma drug concentration / Hepatic excretion rate
d Elimination rate / plasma drug concentration
- 10 Phase II reaction involves following reaction **1**
a Oxidation
b Conjugation
c Reduction
d Hydrolysis
- 11 USP Dissolution Apparatus IV is called as **1**
a Paddle over disc
b Paddle
c Basket
d Flow through Cell
- 12 Following is the pharmacodynamic method for studying bioavailability **1**
a Plasma level time studies
b Urinary excretion studies
c Stool excretion studies
d Therapeutic response
- 13 Comparison of AUC of drug given by oral route of administration with AUC of drug given by intravenous route of administration is called as **1**
a Biopharmaceutics
b Bioequivalence
c Absolute bioavailability
d Relative bioavailability
- 14 The steady state concentration C_{ss} for IV infusion is given by **1**
a $C_{ss} = \text{Infusion Rate} - \text{Total Systemic Clearance}$
b $C_{ss} = \text{Infusion Rate} / \text{Total Systemic Clearance}$
c $C_{ss} = \text{Total Systemic Clearance} / \text{Infusion Rate}$
d $C_{ss} = \text{Infusion Rate} \times \text{Total Systemic Clearance}$
- 15 Unit of clearance is given by **1**
a mg / hr
b mL/hr
c mg/L*hr
d hr/mL
- 16 Wagner Nelson method is used to determine **1**
a K_E
b K_A
c AUC
d CL_T
- 17 In the two-compartment open model IV bolus, the initial rapid decline in the drug concentration is due to **1**

- a Absorption
 b Distribution
 c Metabolism
 d Elimination
- 18 In case of Multi compartment model, elimination is indicated by **1**
 a α
 b β
 c μ
 d γ
- 19 In Michaelis Menton equation when $K_m \gg C$ **1**
 a Rate of process is zero order
 b Rate of process is first order
 c Rate of process is half the maximum rate
 d Rate of process is double the maximum rate
- 20 Self induction of enzyme in case of carbamazepine causes _____ in half **1**
 life of drug
 a decrease
 b increase
 c keeps constant
 d decrease followed by increase

Q.II a Attempt any Two. 2x10

- 1 a A single IV bolus injection containing 500 mg of an antibiotic is given to an adult patient (weight = 55 kg). The apparent volume of distribution is 0.1 L/kg and the elimination half-life is 0.75 hour. Assuming the drug is eliminated by first-order kinetics and described by one-compartment model, calculate the following
- a, C_0 **1**
 b. Elimination rate constant and AUC **1**
 c. The amount of drug in the body 4 hours after the dose is given **2**
 d. The time for the drug to decline to 0.5 μ g/ml the minimum inhibitory concentration for streptococci **2**
- 1 b What is apparent volume of distribution? Derive the equation for apparent volume of distribution **3**
- 2 Describe the concept of two compartment model and derive various pharmacokinetic parameters following two compartment open model IV bolus administration of drug. **10**
- 3 Explain the concept of drug distribution and give a detailed note physicochemical properties of the drug affecting distribution with suitable examples **10**

Q.II b Attempt any seven. 7x5

- 1 Explain effect of any two dosage form related factors with suitable examples affecting drug absorption **5**
- 2 Explain the mechanism of active transport of drug with suitable examples **5**
- 3 Justify with reasons, human serum albumin considered a versatile protein for drug binding. Enlist various drug binding sites on human serum albumin **5**
- 4 Explain the concept of IVIVC and discuss its significance. **5**
- 5 Enlist the methods used for assessment of bioavailability of drug. Explain any one method in detail. **5**
- 6 What are the causes on non linearity in absorption and metabolism of drug? Explain with suitable examples. **5**
- 7 Explain the determination of absorption rate constant based on method of feathering following one compartment kinetics. **5**

- 8 What is drug accumulation index? State the equations for determination of Maximum and minimum concentrations at steady state following multiple dosing. 5
- 9 Explain the concept of loading dose and maintenance dose of iv infusion. 5
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