Question Paper

Exam Date & Time: 18-May-2023 (10:00 AM - 01:00 PM)

MANIPAL ACADEMY OF HIGHER EDUCATION

Biopharmaceutics and Pharmacokinetics (Theory) [PCE-BP604T -S3]

Marks: 75 **Duration: 180 mins.**

I Multiple Choice Questions (MCQs)

Answer all the questions. Section Duration: 30 mins

1) What is the molecular weight cut off for biliary excretion? (1)

- Less than 300 Dalton
- More than 300 Dalton
- Less than 200 Dalton
- More than 200 Dalton

2) What is the mechanism of drug excretion for skin excretion? (1)

- Active secretion
- Glomerular secretion
- Passive diffusion
- Passive reabsorption

3) BCS stands for (1)

- Biopharmaceutical Classification System
- Biological Classification System
- Biopharmaceutical Classification Standard
- Biochemical Classification System

4) Which of the following establishes a single-point relationship between one of the dissolution parameters (e.g. time for specific amount dissolved) and one pharmacokinetic parameter (e.g. AUC or Cmax)? (1)

- Level A
- Level B
- Level C
- Level D

5) Which of the following is the pharmacodynamics method of studying bioavailability? (1)

- Plasma-level time studies
- Acute pharmacologic response
- Urinary excretion studies
- Stool excretion studies

6) What is the full form of PVP and what is its function in drug formulation? (1)

Polyvinyl propylene, diluent
Polyvinyl pyrrolidone, solubilizing agent
Polyvinyl propylene, buffering agent
Polyvinyl pyrrolidone, Binding agent

7) Extrapolation of animal study data of pharmacokinetics of drug to humans is possible by (1)

Catenary model
Mammillary model
Physiologic model
Compartment model

8) Intravenous infusion of drug follows mainly what kinetics of drug administration? (1)

Zero order
First order
Second order
Mixed order

9) Peripheral compartments are arranged as satellites around the central compartment in (1)

Mammillary model
Catenary model
Physiologic model
Noncompartmental analysis

10) Ratio of AUMC to AUC in statistical moments theory gives (1)

Mean elimination time
Mean distribution time
Mean residence time
Mean metabolism time

11) In compartment pharmacokinetic model, highly perfused tissues and organs are included into (1)

First compartment
Second compartment
Third compartment
Fourth compartment

12) . When the dosing interval is decreased and the dose is unchanged in multiple dosing, Cmax, Cmin and Cav _____ and the ratio Cmax/Cmin _____ (1)

Decrease; Increases
Increase; Decreases
Increase; Increases
Decrease; Decreases

13) What kinetics of drug release is mainly followed by maintenance dose in multiple dosing of drug? (1)

Second order
First order
Zero order
Mixed order

14) Number of half-lives of drug required to attain steady state drug levels following multiple administrations with half-life as the dosing interval (1)

One
Two
Three
Five

15) When plasma protein binding of drug gets saturated, apparent volume of distribution (1)

Increases
Decreases
Remain constant
Increase and then decrease

16) Rate of change of drug concentration in nonlinear pharmacokinetics attains a maximum value and constancy when (1)

Km value is very high than concentration of drug
Km value is very less than concentration of drug
Km value and concentration of drug are equal
All of the above

17) When tubular reabsorption of the drug becomes capacity limited renal clearance (1)

Decreases
Increases
Remain constant
Increase and then decrease

18) Saturation of first pass metabolism of the drug is mainly a cause of nonlinearity in (1)

Drug absorption
Drug distribution
Drug metabolism
Drug excretion

19) Mechanism of drug absorption that can cause nonlinearity (1)

Passive diffusion
Pore transport
Active transport
Convective transport

20) Nonlinear pharmacokinetics of a drug follows (1)

First and second order kinetics
Zero and second order kinetics
Zero and first order kinetics
Zero, first and second order kinetics

II Long Answers

Answer all the questions.

1) Explain different phases of renal excretion of drug with neat labelled diagram. (10)

2) Explain the pharmacokinetics of drug in blood upon Intravenous bolus administration if it follows one (10)

compartment open model

III Short Answers

Answer all the questions.

1)	How the nature and type of dosage form affects the absorption of dosage form?	(5)
2)	Differentiate between the plasma protein and tissue binding of drugs.	(5)
3)	Discuss on drug absorption by Endocytosis mechanism.	(5)
4)	How to deduce various pharmacokinetic parameters by the application of the concept of method of residuals in two compartment open model IV bolus administration of the drug?	(5)
5)	Using suitable diagrams, explain the effects of dose size and dosing frequency on the pharmacokinetic profile of drug in multiple dosing by oral administration?	(5)
6)	What are the causes of nonlinearity in drug distribution and drug metabolism? Explain.	(5)
7)	Explain the application of concept of Michaelis Menton equation to describe nonlinear pharmacokinetics.	(5)

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