2. Explain the factors influencing drug distribution. Add a note on physiological barriers involving in drug distribution. (3+7)

3. Derive the equation for various pharmacokinetic parameters after intravenous bolus administration of drug which follows one compartment open model.

III. Short answers (Answer seven out of nine questions) 5x7=35

1. Demonstrate theories of dissolution involved in absorption.

2. Explain the kinetics in protein binding.

3. Explain phase I reactions.

4. Explain the plasma concentration time – plot for multiple oral administration.

5. Discuss any five methods for enhancing oral bio-availability of drugs.

6. Define IVIVC. Explain the different levels of IVIVC. (1+4)

7. Define bioavailability. Explain methods for determining the bioavailability. (1+4)

8. Describe sigma minus method in determination of Ke from urinary excretion data.

9. Discuss the causes of nonlinearity.

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B Pharm Even Semester Examination, September, 2023

PHARMACEUTICAL SCIENCES

(6th Semester)

Course No: BP-604T
(Biopharmaceutics & Pharmacokinetics- Theory)

FM: 75
Time: 3 Hours

The figures in the right margin indicate full marks for the question

I. A. Multiple Choice questions 1x10=10

1. The following one is the rate-limiting step for the absorption of BCS Class I drugs.

   a) Dissolution b) Permeability

   c) Gastric emptying d) Case by case

2. The total area of solid surface of any drug particle is expressed by

   a) Relative surface area

   b) Absolute surface area

   c) Effective surface area

   d) Critical surface area

3. Which form of drug shows most rapid dissolution rate?

   a) Crystalline b) Meta stable

   c) Amorphous d) Hydrate

4. The biomarker, antipyrine is used to measure the volume of the following real physiological compartment

a) Plasma b) Total body water

c) Erythrocytes d) Extracellular fluid

5. Which of these attributes is most commonly connected with a large apparent volume of distribution?

a) High hepatic extraction ratio

b) Extensive binding to plasma protein

c) Extensive binding to tissue constituents

d) Distribution into total body water

6. The decrease in hepatic enzyme activity that results in reduced metabolism of drugs

a) Hydrophilic

b) First-pass metabolism

c) Gastric emptying time

d) Enzyme inhibition

7. The dose dependent kinetics is

a) Zero order kinetics

b) First order kinetics

c) Second order kinetics

d) Mixed order kinetics

8. Absorption rate constant can be measured by the following

a) Method of residual

b) Michaelis menten equation

c) Lineweaver-burke plot

d) All of the above

9. Which method is useful to determine KE from urinary excretion data

a) Wagner-Nelson method

b) Sigma-minus method

c) Loo-Riegelman method

d) Koltz plot method

10. The area under the serum concentration time curve of the drug represents

a) The biological half-life of the drug

b) The amount of drug in the original dosage form

c) The amount of drug absorbed

d) The amount of drug excreted

I. B. Objective type 2x5=10

1. Write the applications of biopharmaceutics.
2. What is the significance of plasma protein binding?
3. Define the term apparent volume of distribution.
4. What is mean by soft drug. Give example. 1+1
5. Differentiate absolute and relative bioavailability.
6. What is 'mean resident time'?

II. Long answers (Answer two out of three questions) 10x2=20

1. Explain the structure of cell membrane and discuss about the passive transport of drug across cell membrane. (3+7)