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Pharmaceutical Technology
Brainware University
Barasat, Kolkata-700125

# BRAINWARE UNIVERSITY

## Term End Examination 2025-2026
## Programme – B.Pharm-2020/B.Pharm-2021/B.Pharm-2022/B.Pharm-2023
## Course Name – Biopharmaceutics and Pharmacokinetics Theory
## Course Code - BP604T
## ( Semester VI )

**Full Marks : 75** **Time : 3:0 Hours**

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

### Group-A
(Multiple Choice Type Question) 1 x 20=20

1. *Choose the correct alternative from the following :*

(i) What is the ideal solubility rate of an orally administered drug in the pH range of 2 to 8?

a) 3-4 mg/ml b) 4-6 mg/ml
c) 7-8 mg/ml d) 1-2 mg/ml

(ii) In the sequence of events in the drug absorption from orally administered solid dosage, select the step which comes at first.

a) Disintegration b) Deaggregation
c) Dissolution d) Absorption

(iii) From the following option, select the theory which takes into account that a thin film is created by the solution of the solid at the solid-liquid interface.

a) Interfacial barrier model b) Diffusion layer model
c) Penetration or surface renewal theory d) Danckwert's model

(iv) Identify the option that is not a theory of drug dissolution.

a) Diffusion layer model b) Fick's law of diffusion
c) Interfacial barrier model d) Penetration or surface renewal theory

(v) From the following options, select the characteristic of matrix dissolution-controlled release systems.

a) Release the drug along the entire length of GIT b) Prolong their residence in the GIT and release
c) Release only at a specific site d) Employ waxes to control the rate of dissolution

(vi) Select the characteristics of diffusion-controlled release systems.

a) Release the drug along the entire length of GIT b) Diffusion of the dissolved drug
c) Release only at a specific drug d) Employ waxes to control the rate of dissolution

(vii) From the following, name the option which is a physicochemical property of drug substance.

a) Solubility of drug
b) Disintegration time
c) Age of patient
d) Dissolution time

(viii) If distribution of drug is slower than process of biotransformation and elimination, select the possible outcome.

a) It will cause high blood level of drug
b) It will cause low blood level of drug
c) Cause failure to attain diffusion equilibrium
d) No effect

(ix) Distinguish the characteristic of encapsulation or coating dissolution-controlled release systems.

a) Microencapsulation using slowly dissolving materials
b) Prolonged their residence in the GIT and release
c) Release only at a specific drug
d) Employ waxes to control the rate of dissolution

(x) From the following options, distinguish the driving force for passive diffusion.

a) Concentration gradient only
b) Electrochemical gradient only
c) Charge equilibration and concentration gradient
d) Concentration and Electrochemical gradient

(xi) The onset of drug action represents the rate of-

a) Drug absorption
b) Drug dissociation
c) pH
d) GI motility

(xii) Movement of ions through the pores in cell membrane can be predicted by-

a) Counter ion transport
b) Expenditure of intracellular energy
c) Both a & b
d) None of them

(xiii) Predict the following option which has very low perfusion rate.

a) Fat and bone
b) Muscle and skin
c) Lungs and kidney
d) Liver and Heart

(xiv) Predict the outcome, when an obese person is given with a lipophilic drug.

a) Drug aggregation will begin
b) He cannot absorb lipophilic drugs
c) High adipose tissue take up most of the lipophilic drug
d) A large amount of drug is needed as the person's weight is more

(xv) Identify the equation to find out the apparent volume of distribution.

a) Amount of drug in the body/plasma drug concentration
b) Plasma drugconcentration/amount of drug in the body
c) 1 / plasma drug concentration
d) 1 / Amount of drug in the body

(xvi) Choose the correct option which expresses Michaelis-Menten equation.

a) $-dC/dt = Vmax\ C/Km+C$
b) $dC/dt = Vmax\ C/Km+C$
c) $-dC/dt = Vmax\ C/Km$
d) $-dC/dt = Km+C/Vmax\ C$

(xvii) Choose the principal organ for drug excretion.

a) Lungs
b) Liver
c) Kidneys
d) Sweat glands

(xviii) From the given option, choose the molecular weight cut off for biliary excretion.

a) Less than 300 Dalton
b) More than 300 Dalton
c) Less than 200 Dalton
d) More than 200 Dalton

(xix) From the following option, choose the factor which does not influence the pulmonary excretion.

a) Pulmonary blood flow
b) The solubility of volatile substance
c) Rate of respiration
d) Heart rate

(xx) From the following options, choose the expression for total systemic clearance.

a) Sum of clearance from kidney
b) Sum of clearance from kidney and liver
c) Sum of clearance form non-renal clearances
d) Sum of renal and non-renal clearances

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## Group-B

(Short Answer Type Questions) 5 x 7=35

2. With a neat sketch explain the binding sites for human serum albumin. (5)
3. Briefly describe the concept of pharmacokinetics mentioning its significance. (5)
4. Explain in detail about protein binding and its significance. (5)

5. Briefly describe about passive diffusion process for transporting drug molecules. (5)
6. Describe about ion pair transport for drug absorption. (5)
7. Illustrate and explain the plasma concentration time – plot for multiple oral administration. (5)

**OR**

Correlate loading dose and maintenance dose. (5)

8. Analyze the effect of Ka and Ke on Cmax, tmax and AUC. (5)

**OR**

Explain in detail about the parameters used in adjustment of dosage regimen. (5)

## Group-C

(Long Answer Type Questions) 10 x 2=20

9. Explain in detail about one-compartment open model for a drug administered by extravascular route in determining the pharmacokinetic parameters. (10)
10. Explain and classify the compartment modeling in pharmacokinetic study with its significance and limitations. (10)

**OR**

Explain the theories of drug dissolution in determining the pharmacokinetics of administered drug. (10)

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