3/11/24

Seat Number | | | | | | |

DAGDU-40

BP-604-T

Biopharmaceutics and Pharmacokinetics

(736604)

Total Pages : 5]

Time : 3 Hours **Max. Marks : 75**

Note : (1) Do not write anything on question paper except Seat No.

(2) Graph or diagram should be drawn with the black ink pen being used for writing paper or black HB pencil.

(3) Students should note, no supplement will be provided.

(4) *All* questions are compulsory.

1. Multiple choice questions : 10

(*i*) Non-linear pharmacokinetics is called as :

(*a*) Mixed order kinetics

(*b*) Capacity limited kinetics

(*c*) Dose-dependent kinetics

(*d*) All the above

(*ii*) What kind of substances cannot permeate membranes by passive diffusion ?

(*a*) Lipophilic

(*b*) Hydrophobic

(*c*) Hydrophilic

(*d*) Non-ionized

P.T.O.

(iii) k_m and V_{max} can be estimated from :

(a) Noyes-Whitney's equation

(b) Michaelis-Menten equation

(c) Fick's law

(d) None of the above

(iv) Parenteral administration :

(a) Cannot be used in unconscious patients

(b) Generally results in a less accurate dosage than oral administration

(c) Usually produces a more rapid response than oral administration

(d) Is too slow for emergency use

(v) Biological half-life does not depend on :

(a) Biotransformation

(b) Time of drug absorption

(c) Concentration of drug in plasma

(d) Role of drug elimination

(vi) Which route of drug administration is most likely to lead to first pass effect ?

(a) Sublingual

(b) Oral

(c) Intravenous

(d) Intramuscular

(vii) A study of what the body does to the drug is .....

(a) Pharmacodynamics

(b) Pharmacotherapeutics

(c) First pass metabolism

(d) Pharmacokinetics

(viii) Which of the following is not a physiological barrier to distribution of drugs ?

(a) Blood brain barrier

(b) Blood skin barrier

(c) Blood CSF barrier

(d) Blood placental barrier

(ix) In Michaelis-Menten equation, when $k_m << C$, the equation becomes :

(a) $\frac{-dc}{dt} = \frac{V_{max}C}{k_m + C}$

(b) $\frac{-dc}{dt} = \frac{V_{max}C}{k_m}$

(c) $\frac{-dc}{dt} = \frac{C}{k_m + C}$

(d) $\frac{-dc}{dt} = V_{max}$

(x) Dose ratio is :

(a) $\frac{\text{Loading dose}}{\text{maintenance dose}}$

(b) $\frac{\text{Loading dose}}{\text{maintenance dose}} \times 100$

(c) $\frac{\text{Maintenance dose}}{\text{loading dose}}$

(d) None of the above

2. Answer the following (**2** marks each) : 10

(a) Define the term clearance with formula.

(b) Define pharmacodynamics.

(c) What are the objectives of bioavailability studies ?

(d) Enlist the formulation related factors influencing GI absorption of drugs.

(e) Define non-linear pharmacokinetics.

3. Solve any *two* : 20

(a) Describe various pharmacokinetic models.

(b) Explain in detail various mechanisms of drug absorption through barriers.

(c) Write a short note on In-vitro-In-vivo-Correlation (IVIVC).

4. Solve any *seven* : 35

(a) Write a note on Fick's first law of diffusion.

(*b*) Define :

(*i*) Bioavailability

(*ii*) Biopharmaceutics

(*iii*) Disposition

(*iv*) Teratogenicity

(*v*) Perfusion rate.

(*c*) Explain in detail factors affecting elimination.

(*d*) Write a note on theories of drug dissolution.

(*e*) Explain various factors affecting drug distribution.

(*f*) Explain any *five* non-renal routes of excretion.

(*g*) Write down in detail bioequivalence study design.

(*h*) Explain in detail the methods for bioavailability measurement.

(*i*) What is protein binding of drugs and its types and add a note on mechanism of protein drug binding.