(3 Hours)   [Total Marks : 70

N.B. : (1)   All the questions are compulsory
      (2)   Figures to the right indicate full marks
      (3)   Use of scientific calculator is permitted.

1. Answer the following: 15
     (a)   Define Absorption   2
     (b)   Which are the different routes of parenteral drug administration?   2
     (c)   Why is the volume of distribution called apparent?   1
     (d)   What is enzyme induction?   2
     (e)   What is enterohepatic cycling of drugs?   2
     (f)   What is the Biopharmaceutical classification system of drugs?   2
     (g)   What is meant by one compartment open model?   2
     (h)   What is absolute bioavailability?   2

2. (a)   Differentiate between passive and active transport mechanisms.   4
     (b)   Write a note on pH partition Hypothesis   4
     (c)   Explain the importance of gastric emptying in drug absorption.   3

3. (a)   Compare the bioavailability of a drug from solution and suspension dosage forms.   3
     (b)   What is the significance of protein binding on the volume of distribution.   4
     (c)   Discuss rate of excretion method of urine analysis after IV administration.
<div align="center">OR</div>
     Discuss causes of non-linearity in drug absorption and drug excretion.   4

4. (a)   Enlist Phase I reactions and describe any one briefly.   4
     (b)   What is hepatic clearance and hepatic extraction ratio.   3
     (c)   Discuss the effect of distribution and binding characteristics of drug on renal clearance.   4

TURN OVER

2

5. (a) How does particle size influence the dissolution rate of drugs?   4
   (b) Which dissolution rate apparatus is most appropriate for dissolution studies   3
   for the following dosage forms:
   Transdermal patches, chewable tablet and Liposomes.
   (c) How is bioavailability measured by pharmacodynamic methods.   4

<div align="center">OR</div>

   Write a note on Biowaivers.

6. (a) Discuss method of residuals for extravascular administration.   4

<div align="center">OR</div>

   Describe the pharmacokinetic parameters after IV administration of a drug.

   (b) An intravenous bolus dose(100mg) of a drug following one compartment
   kinetics gave an extrapolated concentration at zero time of 25 mg/L
   (milligram per litre) and a $'K'_E$ value of 0.85 hr^{-1}.

   Calculate:
       (i)   Volume of distribution   1
       (ii)   Half Life   1
       (iii) AUC (zero to infinity)   1
       (iv) The amount of drug eliminated from the body after 6 hours   2
       (v)   Time required to eliminate 65% of the dose.   2

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