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MPH 202 T

Roll No. of candidate .

2019

M.Pharm 2nd Semester End-Term Examination

ADVANCED BIOPHARMACEUTICS AND PHARMACOKINETICS

(New Regulation)

(w.e.f 2017-2018)

Full Marks – 75 Time – Three hours

The figures in the margin indicate full marks for the questions.

1. Choose the correct answer of the followings : $(10 \times 1 = 10)$

   (i) The major mechanism of drug transport involved in the transport of drug out of the blood into tissues is :

   (a) Aqueous diffusion

   (b) Lipid diffusion

   (c) Active transport

   (d) Facilitated transport

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(ii) Noyes and Whitney equation is used to describe

(a) Absorption

(b) Dissolution

(c) Distribution

(d) Disintegration

(iii) The Volume of distribution of drug is _____

(a) An expression of total body volume

(b) A measure of total fluid volume

(c) A relationship between the total amount of drug in the body and the concentration of the drug in the blood

(d) Proportional to bioavailabiliiy of the drug

(iv) The rate of drug bioavailability is most rapid when the drug is formulated as a

(a) Controlled release product

(b) Hard gelatin capsule

(c) Tablet

(d) Solution

(v) Protein binding of drugs helps to maintain _____ for absorption of drugs.

(a) Nonsink condition

(b) Sink condition

(c) Biological condition

(d) None of the above

(vi) According to pH partition theory, a weakly acidic drug will most likely be absorbed from the stomach because the drug which exist primarily in the

(a) Un ionized, more lipid soluble form

(b) Ionised, more water soluble form

(c) Form of weak acid and more soluble in acid media

(d) Ionic form of the drug, which facilitates diffusion

(vii) Which of the following is carrier mediated transport system?

(a) Passive diffusion

(b) Active transport

(c) Pore transport

(d) None of the above

(viii) Absorption of poorly soluble drug is

(a) Diffusion rate limited

(b) Dissolution rate limited

(c) Both (a) and (b)

(d) None of the above

(ix) Micronized form of drug absorbed fast because

(a) Surface area increased

(b) Viscosity increased

(c) Angle of distribution increased

(d) None of the above

(x) The rate of drug transport across a cell membrane by lipid diffusion depends on all of the following except

(a) Surface area of absorption

(b) Lipid partition coefficient

(c) Density of transporters

2. Answer the following questions (any *seven*) :

$(7 \times 5 = 35)$

(a) State the pH-partition hypothesis briefly. On what assumptions this statement is based?

(b) Discuss factors influencing GI absorption of drug.

(c) Discuss in vitro methods for studying drug uptake.

(d) Differentiate between compartment and physiological models.

(e) What are the two major mechanisms by which drug-drug interactions can develop? Quote examples of beneficial drug interaction.

(f) What are pharmacokinetic models? What is the importance and utility of developing such models? Discuss briefly the types of Pharmacokinetic models.

(g) Define dose-dependent kinetics. Mention the tests used to detect nonlinearity in pharmacokinetics.

(h) What are the applications and limitations of methods of residuals? What is the influence of Ka and K_E on C_{max}, t_{max} and AUC?

(i) What is noncompartmental analysis of drug? Discuss the merits and demerits of such an approach.

3. Answer the following questions (any *three*) : $(3 \times 10 = 30)$

(a) What are the objectives of dissolution profile comparison? Discuss the method for comparison of dissolution profile with proper statistical equations.

(b) Discuss the objectives for conductance of bioequivalence studies. Enlist the elements of bioequivalence study protocol.

(c) Derive K_a values by method of residuals and explain the flip-flop phenomenon with proper illustration.

(d) Write notes (any *two*) :

(i) In viro-in vivo correlation

(ii) Loo-Riegelman method for estimation of Ka.

(iii) Causes of nonlinearity in pharmacokinetics.

(e) A product is degrades according to first-order kinetics. When prepared, the concentration of active ingredient was 23 μg/mL and after 5 months, the concentration of active ingredient was 21 μg/mL. Calculate time, when concentration of active ingredient in the product will be 17.5 μg/mL.