**[Time: Three Hours]** **[ Marks:80]**

Please check whether you have got the right question paper.

N.B: 1. All questions are compulsory.
2. Draw neat and well labelled diagram wherever necessary.

Q.1 a) Define order of reaction and specific rate constant. 2

b) Explain concept of diffusion. 2

c) Explain role of complexation in solubilization. 2

d) Define the following terms 1.Pharmacokinetics 2.Bioavailability. 2

e) Classify dispersed systems with examples. 2

f) Explain dissolution mechanisms. 2

g) Write the effects of any two factors affecting rate of reaction. 2

h) Differentiate between lyophilic and lyophobic colloids. 2

i) Classify drugs as per the BCS giving examples of each class. 2

J) Explain role of accelerated stability studies in expiration dating of Pharmaceutical dosage forms. 2

Q.2 a) Explain steady state diffusion and driving forces for diffusion in pharmaceutical Systems. 4

**OR**

a) Give Fick's first and second law of diffusion.
b) Explain any one method of analysis of complexes. 4
c) Explain DLVO theory. 4

Q.3 a) Explain various physical and chemical factors influencing the chemical degradation of Pharmaceutical product. 4

b) Give Noyes Whitney equation and explain significance of the same. 4

c) Enlist Physiological and physicochemical factors affecting drug absorption. Explain any two in detail. 4

**OR**

C) Give reasons for following:
1. Metastable polymorph is preferred by the formulators.
2. Small intestine is the primary site for absorption site for majority of drugs.

Q.4 a) Explain measurement of diffusion by Franz diffusion cell. 4

b) Classify various modes of drug transport. Explain passive diffusion in detail. 4

c) Give classification of complexes with examples and explain any one type in detail. 4

Q.5 a) Enlist the various methods to determine order of a reaction and explain any two in detail. 4

b) Explain Nernst and Zeta potential. 4

**OR**

b) Discuss thermodynamic instability of disperse system.

C) Write a note on kinetic properties of Colloids. 4

Q.6 a) 50 % of a first order reaction is complete in 35 minutes. Calculate the time required to complete 90 % of the reaction. 4

**OR**

a) The initial concentrations of both ethyl acetate and sodium hydroxide in the mixture were 0.01000 M .The change in concentration, x,of alkali during 30 min was 0.000477 mole/liter. Compute the rate constant.

b) Enlist theories of emulsification and explain any one in detail. 4

c) What are protective colloids? Explain how the protective action of colloids is measured. 4

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