[Time: 3 Hours] **[Marks:80]**

Please check whether you have got the right question paper.

N.B: 1. All questions are compulsory.
2. Draw neat labelled diagrams wherever necessary.

Q.1 a) Define order of reaction and molecularity. **02**
b) Explain diffusion and its significance. **02**
c) Comment on protein binding. **02**
d) Elaborate on concept of bioavailability. **02**
e) Enlist properties of colloidal suspensions. **02**
f) State the importance of dissolution in pharmaceutical formulations. **02**
g) Differentiate between 1^{st} and 2^{nd} order reaction. **02**
h) Give applications of colloids. **02**
i) What is BCS classification? **02**
j) Define shelf life and give its formula. **02**

Q.2 Answer the following. **04**
a) State & explain Fick's first law of diffusion and permeability.

OR

Elaborate on driving forces for diffusion and permeability. **04**

b) How is complexation measured? Explain with an example. **04**
c) Write short note on DLVO theory. **04**

Q.3 Answer the following.
a) Detail on chemical factors affecting rate of reaction. **04**
b) What are the factors that affect rate of dissolution? **04**
c) Which dosage form related factors affect absorption? Explain any three in detail. **04**

OR

Explain with three examples the effect of physicochemical factors on drug absorption.

Q.4 Answer the following.
a) Define intrinsic dissolution rate and explain how it is measured. **04**
b) Write short note on mechanism of drug absorption. **04**
c) Classify complexes and describe inclusion complex in detail. **04**

Q.5 Answer the following.

a) Derive zero order reaction equation and list out methods for determination of order of reaction. **04**

b) Comment on zeta potential and Nernst potential with help of diagram. **04**

OR

Explain electrical double layer and the effect of electrolytes on dispersions.

c) State various Kinetic properties of colloids. **04**

Q.6 Answer the following.

a) If a chemical reaction takes 23 minutes to complete half part, calculate the time required for completion of 90% reaction. **04**

OR

The concentration of Drug A reduced to 9.6 mg/ml from initial value of 57.9 mg/ml after 65 minutes. Find the reaction rate constant and concentration after 25 minutes.

b) Suggest measures to be taken for ensuring stability of emulsion. **04**

c) Write a short note on protective colloids and Schultz Hardy rule. **04**
