M.Sc. (Part–I) Semester—I (C.B.C.S. Scheme) Examination
1SA3 : PHARMACEUTICAL CHEMISTRY
(Physical Chemistry)

Time : Three Hours] [Maximum Marks : 80

Note :—(1) **ALL** questions are compulsory and carry equal marks.

(2) Use of calculator and log table are allowed.

1. (a) Explain partial molar properties and how they can be determined. 8

   (b) Write a note on :—

   (i) asymmetric effect

   (ii) electrophoretic effect. 8

OR

   (p) Explain the concept of free energy, entropy fugacity and activity. Give its relation with each other. 8

   (q) Deduce thermodynamics of ideal and non-ideal mixtures. 8

2. (a) Explain translational and rotational partition function. 8

   (b) Discuss the theories of specific heat for solids. 8

OR

   (p) How thermodynamic functions and equilibrium constant are calculated from partition function ? 8

   (q) Define probability and ensembles with suitable examples. 4

   (r) Explain Sterling approximation. 4

3. (a) Discuss classification of two component system with suitable example. 8

   (b) Explain application in crystallization of pure component of two salts and water. 8

OR

   (p) What is Rochelle's salt ? Explain effect of temperature on three partially miscible pair. 8

   (q) Explain three component system with suitable example and discuss method of graphical representation. 8

4. (a) What are Photochemical reactions ? Explain quantum yield calculation. 8

   (b) Discuss flash photolysis in detail. 8

OR

   (p) Explain transition state theory and compare result with Eyring and Arrhenius equation. 8

   (q) Explain the kinetics of Oscillator reactions with suitable examples. 8

5. (a) Explain mechanism of surface reactions. 4

   (b) Derive Kelvin equation. 4

   (c) Deduce Gibbs adsorption equation. 8

OR

   (p) Discuss Homogenous catalysis and Acid-base catalysis with example. 8

   (q) Discuss salient features of Langmuir and Freundlich adsorption isotherm. 8