AQ – 869

First Semester M. Sc. (Part – I) (CBCS) Examination

PHARMACEUTICAL CHEMISTRY

Paper – 1 SA 3

(Physical Chemistry)

P. Pages : 3

Time : Three Hours] [Max. Marks : 80

Note : (1) All questions are compulsory and carry equal marks.

(2) Use of log table and Calculator is permitted.

1. (a) Define and explain entropy, fugacity, free energy and activity. 8

(b) Explain thermodynamics of ideal and non ideal mixtures. 8

OR

(p) Explain Partial molar properties and their determination. 6

(q) Discuss postulaes of Debye Huckel theory. 4

(r) Define and explain Activity coefficients and mean ionic activity coefficient of electrolytes. 6

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

(b) Explain how thermodynamic functions and equilibrium constants calculated from partition function. 8

OR

(p) Discuss theories of specific heat for solids. 6

(q) Explain probability, ensembles and distribution law. 6

(r) Explain Bose–Einstein and Fermi–Dirac statistics. 4

3. (a) Explain classification of two component systems with example. 8

(b) Describe formation of a eutectic system in ternary system containing two solids and a liquid. 8

OR

(p) Draw and explain well labelled phase diagram of a general two component simple eutectic system. 8

(q) What do you mean by 3–component system ? How is a ternary system represented ? 8

4. (a) Derive rate equation for 2nd order reaction and write the characteristics of it. 4

(b) Describe the principle and experimental details of stopped flow technique and flush photolysis. 8

(c) Describe the salt effect on kinetics of ionic reaction. 4

OR

(p) Write and explain transition state theory. 8

(q) Describe chain reactions and oscillator reactions with suitable examples. 8

5. (a) Write and explain Gibbs adsorption equation. 6

(b) Describe Harkins and Jura method for determination of surface area of the absorbent. 6

(c) Explain surface catalysis. 4

OR

(p) Explain theory of Langmuir and Freundlich adsorption isotherm. 8

(q) Explain acid–base catalysis. 4

(r) Derive Kelvin equation. 4