

PANJAB UNIVERSITY, CHANDIGARH

B.Sc.-II [Semester-III]

Paper-XI : PHYSICAL CHEMISTRY-A

Time : 3 Hrs.

Max. Marks : 22 + 3

60 Hrs. (2 Hrs./Week)

3 Periods/Week

OBJECTIVE OF THE COURSE

To teach the fundamental concepts of Chemistry and their applications. The syllabus pertaining to B.Sc. (GENERAL) (Semester system) in the subject of Chemistry has been upgraded as per provision of the UGC module and demand of the academic environment. The course contents have been revised from time to time as per suggestions of the teachers of the Chemistry working in the Panjab University, Chandigarh and affiliated colleges. The syllabus contents are duly arranged unit wise and contents are included in such a manner so that due importance is given to requisite intellectual and laboratory skills.

UNIT – I

(8 Hrs.)

Liquid State :

Intermolecular forces, structure of liquids (a qualitative description).

Structural differences between solids, liquids and gases.

Liquid Crystals : Difference between liquid crystal, solid and liquid.

Classification, structure of nematic and cholestric phases. Thermography and seven segment cell.

UNIT – II

(7 Hrs.)

Chemical Equilibrium :

Equilibrium constant and free energy : Thermodynamic derivation of law of mass action. Le-Chatelier's principle.

Reaction isotherm and Reaction isochore-Clapeyron equation and Clausius - Clapeyron equation, applications.

UNIT – III

(8 Hrs.)

Thermodynamics-II :

Second Law of Thermodynamics : Need for the law, different statements of the law, Carnot cycle and its efficiency, Carnot theorem. Thermodynamic scale of temperature.

Concept of Entropy : Entropy as a state function, entropy as a function of V and T, entropy as a function of P and T, entropy change in physical change, Clausius inequality, entropy as a criteria of spontaneity and equilibrium. Entropy change in ideal gases and mixing of gases.

Thermodynamics-III:

Third Law of Thermodynamics : Nernst heat theorem, statement and concept of residual entropy, evaluation of absolute entropy from heat capacity data. Gibbs and Helmholtz functions; Gibbs function (G) and Helmholtz functions (A) as thermodynamic quantities, A and G as criteria for thermodynamic equilibrium and spontaneity, their advantage over entropy change. Variation of G and A with P, V and T.

Instructions for paper setters and candidates:

- (i) Examiner will set total of NINE questions comprising TWO questions from each unit and ONE compulsory question of short answer type covering whole syllabi.
- (ii) The students are required to attempt FIVE questions in all, ONE question from each unit and the Compulsory question.
- (iii) Compulsory question carries six marks and remaining all questions carry four marks each.