SYLLABUS FOR PANJAB UNIVERSITY

INORGANIC CHEMISTRY, PANJAB UNIVERSITY
CHOICE BASED CREDIT SYSTEM
2017

B.Sc. CHEMISTRY COURSE (GENERAL)

General Instructions for teachers, students and paper setters:

1. In each semester, there shall be one Core Course (Credits = 6) in Chemistry subject consisting of three papers of theory and one practical. The theory papers are allocated a total of 100 marks including 10 (Ten) marks for Internal assessment. The Practical examination is of 50 marks including 05 (Five) marks for Internal assessment.
2. The examination time for each of three theory papers as well as practical paper will be three hours.
3. Examiner will set total of NINE questions comprising TWO questions from each unit and ONE compulsory question of short answer type covering whole syllabi. The students are required to attempt FIVE questions in all, ONE question from each unit and the Compulsory question. All questions carry equal marks.
4. The numerical problems/exercises in the question paper should be ~ 25-30%.
5. The use of Non-programmable calculators will be allowed (paper setter should explicitly mention this in the question paper) in the examination centre but these will not be provided by the University/College. Mobile phones and pagers are not allowed in the examination hall.

SYLLABUS

PANJAB UNIVERSITY, CHANDIGARH

B.Sc. CHEMISTRY COURSE (GENERAL)

SEMESTER I

CC : Chemistry I : INORGANIC CHEMISTRY I A

Total Lectures: 30 Hrs. **Max. Marks : 30 + 3***

***Internal Assessment**

UNIT-I

Atomic Structure (8Hrs.)

Idea of de Broglie matter waves, Heisenberg uncertainty principle, atomic orbitals, Schrodinger wave equation, significance of ψ and ψ^2, quantum numbers, radial and angular wave functions and probability distribution curves, shapes of *s, p, d* orbitals. Aufbau and Pauli exclusion principles, Hund's multiplicity rule. Electronic configurations of the elements and ions.

UNIT-II

Perioidic Properties (7 Hrs.)

Position of elements in the periodic table; effective nuclear charge and its Calculations Atomic and ionic radii, ionization energy, electron affinity and electronegativity – definition, methods of determination or evaluation, trends in periodic table and applications in predicting and explaining the chemical behaviour.

UNIT-III

Chemistry of Noble Gases and *s*-Block Elements (7Hrs.)

Chemical properties of the noble gases, chemistry of xenon, structure and bonding in xenon compounds. Comparative study, diagonal relationships, salient features of hydrides, solvation and complexation tendencies including their function in biosystems, an introduction to alkyls and aryls.

UNIT-IV

Chemical Bonding-I (8Hrs.)

Covalent Bond – Valence bond theory and its limitations, directional characteristics of covalent bond, various types of hybridization and shapes of simple inorganic molecules and ions. BeF_2, BF_3, CH_4, PF_5, SF_6, IF_7, $SnCl_2$, XeF_4, BF_4^-, PF_6^-, $SnCl_6^{2-}$. Valence shell electron pair repulsion (VSEPR) theory applied to NH_3, H_3O^+, SF_4, ClF_3, ICl_2^- and H_2O. MO theory, homonuclear (elements and ions of 1st and 2nd row), and heteronuclear (BO, CN, CO^+, NO^+, CO, CN^-), diatomic molecules. Percentage ionic character from dipole moment and electronegativity difference.