

SARDAR PATEL UNIVERSITY
Programme & Subject: M.Sc (Defence Science)
Semester: III
Syllabus with Effect from: June - 2014

Paper Code: PT03CDSC01	Total Credit: 4
Title Of Paper: Chemical Science	

Unit	Description in Detail	Weightage (%)
I	Theoretical treatment of Atomic Structure and Chemical Bonding: Localized band approach, hybridization, delocalized approach to bonding and MO theory as applicable to diatomic and polyatomic molecules (few examples have to be worked out); Chemical applications of group theory: Symmetry Elements, Symmetry operations, Point groups, transformation matrices, molecular properties, character table.	25%
II	Chemistry of main group elements and their compound-D block elements, electronic structure and properties, F block elements-lanthanoid and actanoid chemistry, Allotropes of carbon and boron clusters, inner transition elements-Spectral and magnetic properties, analytical applications.	25%
III	Organometallic compounds-synthesis, bonding, structure and reactivity and applications in homogenous catalysis, concept of catalysis, catalytic reactions including isomerisation, hydrogenation, addition, polymerization, oxidation (examples of each of it)	25%
IV	Principles of Stereochemistry: Conformational analysis, isomerism, chirality-generation of chiral centre, reaction of chiral molecules, generation of second chiral character and related configurations; Reactive intermediates and organic reaction mechanisms, types and formation of reaction intermediates, electron delocalization, generations of Carbocations, Carbanions, Carbenes, nitrenes, arynes, free radicals and ion radicals	25%

Basic Text & Reference Books:-

- J.D. Lee; Concise Inorganic Chemistry, 5th edition, Wiley India
- Peter Atkins, Tina Overton, Jonathan Rourke, Mark Weller, Fraser Armstrong; Shriver & Atkins' Inorganic Chemistry, 5th edition, Oxford
- F. Albert Cotton, Geoffery Wilkinson, Paul L. Gaus; Basic Inorganic Chemistry, 3rd edition, Wiley-India
- Reddy K. V., Symmetry and Spectroscopy of Molecules, New Age International Publishers, 2nd edition, reprint 2011
- Gordon M Barrow; Physical Chemistry, 5th edition, Tata McGraw Hill
- Robert J. Silbey, Robert A. Alberty, Mounqi G. Bawendi; Physical Chemistry, 4th edition, Wiley-India
- Peter Atkins & Julio de Paula; Elements of Physical Chemistry, 5th edition, Oxford
- Robert Thornton Morrison, Robert Neilson Boyd, Saibal Kanti Bhattacharjee; Organic Chemistry, 7th edition, Pearson
- S.M. Mukherji, S.P. Singh, R.P. Kapoor, R. Dass; Organic Chemistry Volume I, 2nd edition, New Age International Publishers
- S.M. Mukherji, S.P. Singh, R.P. Kapoor, R. Dass; Organic Chemistry Volume II, 2nd Revised edition, New Age International Publishers
- S.M. Mukherji, S.P. Singh, R.P. Kapoor; Organic Chemistry Volume III, New Age International Publishers

