M. Sc. Chemistry (Semester – II), Examination, Oct. 2017
Modern Interfaces of Organic & Inorganic Chemistry: Paper-VI
Subject code: 2951

Time: 2.5 hrs Marks: 70
NB: All questions carry equal marks.

Q.1. Answer the following: 14
(a) Discuss: Hofmann rearrangement is an example of intramolecular1, 2 nucleophilic shift. Give applications of the rearrangement.
(b) Explain mechanism of Backman rearrangement and discuss any seven applications of this rearrangement in the organic synthesis.

OR

Q.1. Give a detailed account on: Pinacol-pinacolone and Schmidt rearrangements. 14

Q.2 Give principles and applications of Chichibarin, Barton and Manich reactions in organic reactions. 14

OR

Q.2. Give principles and applications of Ene, Sommelet and Shapiro, reactions in organic reactions. 14

Q.3. Answer the following: 14
(a) Give the preparation and any five applications of $LiAlH_4$.
(b) Give a brief account on lanthanide β-diketonate complexes as contact shift reagent in ^1H NMR spectroscopy.

OR

Q.3. Answer the following: 14
(a) Give the preparation and any five applications of OsO_4.
(b) Discuss the magnetic properties of lanthanide compounds.

Q.4 Answer **any two** questions from the following. 14
1. For benzene molecule, prove that total electron density, $q_r = 6$.
2. For 1,3-cyclobutadiene, prove that it is very unstable molecule.
3. By using perturbation theory, carryout out the first order wave function correction.
4. Discuss any one application of approximation method.

Q.5 Answer **any two** from the following questions. 14
1. Discuss the limitations of CFT and important features of LFT (Application of MOT for complex).
2. Discuss M.O. diagram for Oh-σ-bonding and effect of π-acceptor ligand on the Δo.
3. Discuss physical and chemical properties of metal-π complexes.
4. What do we mean by 'Dioxygen Compounds' and explain its binding and relevance in biology.