M. Sc. Chemistry (Semester – II), Examination, OCT-2016
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. Fries rearrangement is believed to be produced by a combination of intra and inter-molecular mechanism". Discuss. Explain both mechanisms and give illustration.

B. Explain 'Hofmann rearrangement is an example of intra-molecular 1,2-nucleophilic rearrangement'. Give synthetic importance of the reaction with suitable examples.

OR

Q.1. Give detailed account on: Beckman and Lossen cope rearrangements. 14

Q.2. Give principles and applications of Ene, Barton and Freytag reactions in organic reactions. 14

OR

Q.2. Give synthetic importance of the following reactions: 14

(i) MPV reduction (ii) Michael condensation (iii) Oppenauer oxidation

Q.3 Answer the following: 14

1. Discuss the spectral and magnetic properties of lanthanide compounds.
2. Give preparation of PPA. Discuss important applications of PPA in organic synthesis.

OR

Q.3. Answer the following: 14

1. How will you prepare NBS? Give the uses of NBS in organic synthesis. (Applications)
2. Give a brief account on lanthanide β-diketonate complexes as contact shift reagent in NMR spectroscopy.

Q.4 Answer any two questions from the following: 14

1. For the cyclopentadienyl cation, find out electron & charge densities and π- bond order.

[Given: $\Psi_1 = 0.288\ P_1 + 0.5\ P_2 + 0.577\ P_3 + 0.5\ P_4 + 0.288\ P_5$),

$\Psi_2 = 0.5\ (P_1 + P_2 - P_4 - P_5)$, $\Psi_3 = 0.577\ (P_1 - P_3 + P_5)$]

2. Find out E_π, π-bonding energy and delocalization energy for1,3-butadiene.
3. Explain the perturbation theory for non-degenerate state.
4. Explain the differences between VB and MO theory.

Q.5 Answer any two from the following questions: 14

1. Discuss the limitations of CFT and MOT.
2. Explain the variation principle.
3. Write a note on Di-nitrogen complexes.
4. Write a note on: Metal-π complexes of Transition metals.