

B.Sc (P) Physical Science

Semester-VI

Paper Name: Organometallics. Bioinorganic Chemistry, Polynuclear hydrocarbons, UV-IR Spectroscopy

Attempt any five questions

maximum marks: 75

Question 1. Write down the names and structures of three heterocyclic compounds with three different hetero atoms. Compare their aromatic character and give one method for the preparation of each.

Question 2. Describe the methods of isolation of naphthalene from coal tar and petroleum. Discuss the structure of naphthalene, is it more aromatic than benzene. How can you establish that naphthalene molecule has two ortho-fused benzene rings.

Question 3. Outline the major difference between resonance and tautomerism. Discuss the various factors that are responsible for stabilizing enols forms in keto-enol tautomeric systems. Give chemical evidence in favour of keto and enol forms of ethyl acetoacetate.

Question 4. What is claisen ester condensation? What is the final product? Why should we use excess of sodium ethoxide during this reaction? Give the ionic mechanism of Claisen condensation.

Question5. Explain how an auxochrome exerts a bathochromic shift on $c=c$ chromophore. On the basis of Woodward-Fieser rules, calculate λ_{max} for the following compounds.

Methyl vinyl ketone, 2-Cyclopentenone, 2-Methyl-1-acetylcyclopentene.

Question6. Discuss in details the applications of IR spectroscopy.