

Total No. of Questions : 09

M.Sc.(Chemistry) (2015 to 2017) (Sem.-2)

ORGANIC CHEMISTRY – II

Subject Code : MSCH-201

Paper ID : [A2800]

Time : 3 Hrs.

Max. Marks : 100

INSTRUCTION TO CANDIDATES :

1. Candidate is required to attempt 5 (FIVE) questions in ALL.
2. Attempt one question each from SECTION A, B, C and D.
3. Section E is compulsory. All questions carry EQUAL marks.

SECTION-A

1.
 - a) Describe the conformational isomerism of 3,5-dimethylcyclohexane, considering cyclohexane ring to be planer.
 - b) Explain the following :
 - i) Relation between elements of symmetry and optical activity
 - ii) Why is it not possible under ordinary conditions to resolve amines even though three different groups are attached to the nitrogen?
 - c) What is the effect of configuration on reactivity? Explain giving suitable examples. (7+8+5)
2.
 - a) How Prelog's rule is helpful in assignment of configuration? Explain giving suitable examples.
 - b) Explain optical isomerism in Biphenyls giving suitable examples.
 - c) Write note on Absolute chiral synthesis. (7+8+5)

SECTION-B

3. a) What are calixarenes? Describe the conformations, synthesis and applications of calixarenes.
- b) Describe the following :
- i) Fullerenes ii) Cryptands (10+5+5)

4. a) Describe supramolecular catalysis giving suitable examples.
b) Describe the following :
i) Supramolecular photochemistry ii) Catenanes
c) Write a note on cyclophanes. (7+8+5)

SECTION-C

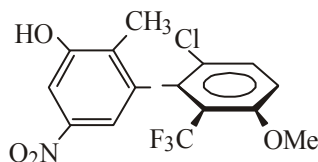
5. a) Describe the photochemistry of dimerization of alkenes.
b) What is Barton reaction? Give its mechanism and applications.
c) What is photochemical oxidation? Describe photo-oxidation of alkenes and polyenes. (6+7+7)
6. a) Draw molecular orbitals of 1,3-butadiene from the linear combination of molecular orbitals of two ethylene molecules.
b) What are chelotropic reactions? Describe [2+2] chelotropic cycloadditions of alkenes with the following:
i) Singlet carbenes ii) SO₂
c) Describe the mechanism and applications of Cope rearrangement. (5+8+7)

SECTION-D

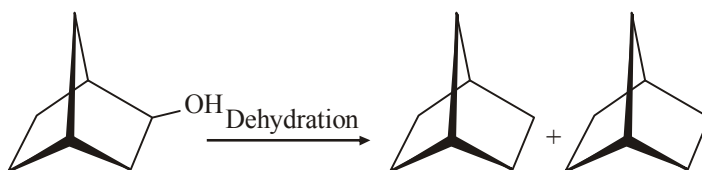
7. a) Describe the oxidative addition reactions catalyzed by transition metal complexes.
b) Describe the insertion reactions giving suitable examples.
c) What is Heterogeneous catalysis by transition metal complexes? Explain mechanism and applications giving suitable examples. (6+7+7)
8. a) Describe the mechanism and applications of hydrosilation reaction.
b) Explain the following :
i) Heck reaction ii) Negishi Coupling reaction (6+7+7)

SECTION-E

9. a) The following biphenyl is chiral. What will be its configuration?

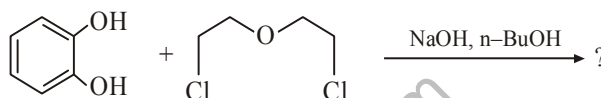


- b) Explain the formation of products in the following reaction.



- c) Comment on the strain in the conformation of bicycle [3.3.1]nonane.

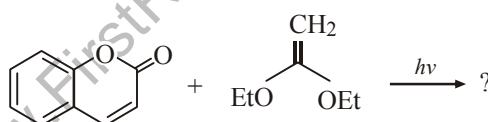
- d) Complete the following:



- e) Give ONE example of molecular recognition of alkyl ammonium cations by 18-crown-6.

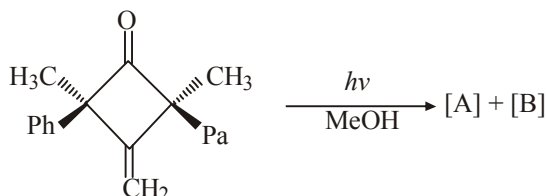
- f) Give the mechanism of Di- π -methane rearrangement.

- g) Complete the following :



- h) Give an example of Claisen rearrangement.

- i) What are products [A] and [B] in the following reaction:



- j) What is Stille reaction?