

M.Sc.(Chem.) Semester - 2 (CBCS) Examination
May/June-2021 (OLD COURSE)
ORGANIC CHEMISTRY(CORE)

Time: 1:30 Hours

Marks: 42

Instructions:

1. Figure to the right indicate marks.
2. There are five questions in the question paper.
3. Answer any three of the following questions.

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- Que-1(A) Answer the followings. (04)
1. Define the terms HOMO, LUMO, conrotatory and disrotatory motion.
 2. Give the laws of photochemistry.
- Que-1(B) Answer the following. (any two) (10)
1. Discuss [3, 3] sigmatropic reaction by giving example of Claisen-Cope rearrangement.
 2. Discuss Diels-Alder reaction and its cyclic transition mechanism.
 3. Explain electrocyclic interconversion of 1,3,5-hexatriene to cyclohexadiene by FMO approach and give correlation diagram.
- Que-2(A) Answer the followings. (04)
1. Define the term pericyclic reaction and give name of each class of pericyclic reaction with suitable example.
 2. Give definition and examples of aromatic, nonaromatic and anti-aromatic compounds.
- Que-2(B) Answer the following. (any two) (10)
1. Draw modified Jablonski diagram and Explain different terms involved in it.
 2. Discuss principle and basic reaction of Paterno-Buch photochemical reaction with suitable mechanism and example.
 3. Discuss photo-reduction and photo-oxidation reaction with suitable example.
- Que-3(A) Answer the followings. (04)
1. Draw π molecular orbital diagram of butadiene system and give electron occupancy.
 2. Define photosensitization. Give examples of photosensitizers.
- Que-3(B) Answer the following. (any two) (10)
1. Discuss Norrish-II reaction with suitable mechanism and example.
 2. Define quantum yield and give its equation. Discuss the factors responsible for low or high quantum yield.
 3. Discuss photo-addition and photo-isomerization reactions with suitable examples.
- Que-4(A) Answer the followings. (04)
1. Give brief about Huckel's rule of aromaticity.
 2. What are the differences between excited singlet and triplet state?
- Que-4(B) Answer the following. (any two) (10)
1. Discuss $4n\pi$ electrocyclic ring opening of cis-3,4-dimethyl cyclobutane involving conrotatory motion and C_2 symmetry by thermal FMO method or Woodward-Hoffmann rule.
 2. Discuss $[4S+2S]\pi$ cycloaddition reaction by PMO rule of FMO method or correlation diagram.
 3. Justify with FMO approach that sigmatropic rearrangement of 1,1-dideuterioprop-1-ene to 3,3-dideuterioprop-1-ene is a photochemically allowed reaction and it involve migration of hydrogen atom.
- Que-5(A) Answer the followings. (04)
1. Give brief about Craig's empirical rule.
 2. Justify that $^1\text{H-NMR}$ is a useful spectroscopic technique for identifying aromaticity.
- Que-5(B) Answer the following. (any two) (10)
1. Give method for synthesis of tropolone and discuss its aromatic behaviour.
 2. Discuss aromaticity of cyclopentadienyl anion and cycloheptatrienyl cation.
 3. Draw the structures of annulenes. Discuss internal proton and their importance in any four annulene system.
