



DHH-003-010202

Seat No. _____

M. Sc. (Sem. - II) (CBCS) Examination

May / June - 2015

Organic Chemistry : Paper (C) - 202

Faculty Code : 003

Subject Code : 010202

Time : $2\frac{1}{2}$ Hours]

[Total Marks : 70

- Instructions:** 1. All the questions carry equal Marks.
2. Attempt five questions in all.

Q.1. Answer any seven of the following briefly. 14

- Define the term Pericyclic reaction and classify with two suitable examples.
- Explain the term photochemistry and classification with one suitable example.
- Distinguish the following compounds in aromatic, nonaromatic and anti-aromatic.
(i) C_8H_8 (ii) $C_8H_8^{+2}$ (iii) $C_7H_7^{-1}$ (iv) $C_{14}H_{10}$ (v) $C_9H_9^{+1}$ (vi) $C_5H_5^{+1}$
- Explain that Pericyclic reaction is also recognized as no reaction mechanism.
- Explain the terms diatropic, anation and partial double bond fixation in aromatic behavior.
- Define the term photophysical process. Explain Einstein's law of photochemical equivalence and Grotthus' Draper law.
- Define the following terms:(Any three)
(i) HOMO, (ii) LUMO, (iii) Photo-chemically allowed reaction, (iv) Conrotatory motion, (v) Disrotatory motion
- Discuss Quantum efficiency with its other name and equation. Discuss the cause of high and low Quantum efficiency.
- Explain, why s-cis conformation of 1,3- butadiene (dine) reacts easily with dinophile than its s-trans conformation of 1,3- butadiene (dine).
- Discuss Quantum efficiency with its other name and equation. Discuss the cause of high and low Quantum efficiency.

Q.2. Answer any two of the following. 14

- Explain $(4n+2)\pi$ electrocyclic reaction of 1,3,5-hexatriene to cyclohexadiene by co-relation method or Huckel-Mobius method.
- Discuss $4n\pi$ electrocyclic ring opening of trans-3,4-dimethyl cyclobutane to (2E,4E)-hexadiene as a major product and (2Z,4Z)-2,4-hexadiene as a minor product involving conrotatory motion and C_2 axis symmetry by thermal FMO method or Woodward-Hoffmann rule.
- Discuss $(2s+2s)\pi$ cyclo-addition reaction ethylene by FMO or correlation diagram or PMO method.

- Q.3. Answer any two of the Following. 14**
- Explain synthesis and aromatic behavior of tropolone.
 - Define Craig's imperial rule and explain aromaticity of pentalene & heptalene.
 - Draw the structures of annulenes. Discuss internal proton and its importance with respect to [14] [mono, dihydro...], [16],[18] and [22] annulenes.
- Q.4. Answer any two of the Following. 14**
- Explain the term photosensitization. Discuss photosensitization reaction between 1,3-butadiene and benzophenone citing product in detail.
 - Draw modified Jablonski diagram and discuss radiative and non-radiative processes for dissipation of energy.
 - Define and explain Norrish-I and Norrish-II photochemical covalent cleavage with suitable examples.
- Q.-5. Answer any two of the following. 14**
- Define and discuss principal, basic chemical reaction of Paterno-Buchi photochemical reaction citing suitable examples.
 - Define Reterocycloaddition or cycloreversion. Explain its importance with at least two examples.
 - Discuss $4n\pi$ electro cyclic conversion of cyclobutene to 1,3-butadiene by FMO or correlation diagram method.
 - Discuss aromatic character of azulene.
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