



FC-142002

Seat No. _____

M. Sc. (Sem. II) Examination

June / July - 2021

MSC0C202 : Organic Chemistry
(Old Course)

Time : 2 Hours]

[Total Marks : 50

- Instructions :**
- (1) Answer only **three (3)** questions.
 - (2) The examination will be for **two (02)** hours.
 - (3) Q. No. **9** is **compulsory** and carries **14** marks.
 - (4) Answer any **two** questions from questions No. 1 to 8. Each question carries **18** marks.

1 (a) Answer the following

- (i) Write a note on the factors affecting the C^{13} chemical shift.
 - (ii) Explain by appropriate example "M-Stable Peak" and "Molecular ion Peak".
- (b) (i)** Do the mass fragmentation for the following molecules.
2-Hexanone, Benzamide
- (ii) Discuss chemical ionization techniques used in mass spectroscopy.

2 (a) Answer the following

- (i) Discuss the mass fragmentation of Benzylbromide in details.
 - (ii) Write a note on High - Resolution-Mass Spectroscopy.
- (b)** Deduce the structure of the compound from the following spectral data with suitable explanation.
- Mol. Wt.: 136
- IR: 2810, 2700, 1683, 1600, 1511, 1315, 1260, 1160, 1024, 833 cm^{-1}
- 1H -NMR: δ = 3.8 (s, 3H), δ = 6.95 (d, 2H), δ = 7.6 (d, 2H), δ = 9.8 (s, 1H)
- ^{13}C NMR: δ = 55.6, 114.5, 130.2, 132.1, 164.5, 191
- Mass: m/z = 136, 135, 119, 107, 92, 65, 64, 63, 51

3 (a) Answer the following

- (i) Explain the modified Jablonski diagram and discuss the terms involved in it.
 - (ii) Explain Norrish type II reaction mechanism with suitable example.
- (b) (i)** On the basis of molecular orbital structure at a carbonyl group, explain photo- reduction of benzophenone in presence of toluene.
- (ii) Write a short note on oxetane formation in detail.

- 4 Answer the following**
Give the synthesis and four important reactions for any three
Oxazole, Imidazole, Benzothiazole, Cinnoline
- 5 Answer the following** (any three)
Discuss the principle and mechanism and synthetic applications of the following.
Birch Reduction
Dickmann Reaction
Witing Reaction
- 6** Discuss the principle and mechanism and synthetic applications of the following. (any three)
Mannich Reaction
Suzuki Reaction
Buchwald Hartwig Reaction
- 7 (a) Discuss selectivity mechanism and three utilities of following reagents.**
(i) Dicyclohexycarbodimide (DCC)
(ii) 2,3,-Dichloro-5,6-dicyanobenzoquinone (DDQ)
(b) (i) 1,3-Dithiane
(ii) Sodiuncyanoborohydride
- 8 (a) Discuss selectivity mechanism and three utilities of following reagents.**
(i) Phase transfer catalysis
(ii) Backers Yeast
(b) (i) Grignard Reagents
(ii) Lithium diisopropylamide (LDA)
- 9 Answer the following**
(a) Give two applications of Baker's Yeast in organic synthesis.
(b) What is Umpolung reagent? Give one application of this reagent.
(c) What is photo sensitizer?
(d) What do you understand by Nitrogen rule?
(e) Give one synthesis of Pyrimidine.
(f) Which ingredients are used in Jones Oxidation reaction?
(g) Deduce structure of the compound from given ^1H NMR data.
 $\text{C}_7\text{H}_7\text{NO}_3$: $\delta = 3.8$ (S, 3H), 6.9 (D, 2H), 8.1 (D, 2H) ppm.
(h) What is Fermi resonance?
(i) What is McLafferty rearrangement?
(j) What is Quantum yield?

- (k) Which reagent is used in Jones Oxidation?
 - (l) What is carbopolladation?
 - (m) What is Swarn Oxidation?
 - (n) Distinguish between base peak and molecular peak.
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