



**FC-302002**

Seat No. \_\_\_\_\_

**M. Sc. (Sem. II) Examination**

**June / July - 2021**

**MSC1C202 : Organic Chemistry**

**(New 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 :

- (1) Discuss chemical Ionization techniques used in mass spectroscopy.
- (2) How mass spectra are useful in detecting the presence of an atom Br, Cl, I in molecule.

- (B)
- (1) Write a note on the factors affecting the  $^{13}\text{C}$  chemical shift.
  - (2) Discuss the mass fragmentation of Benzyl bromide in detail.

2 (A) Answer the following :

Deduce the structure of the compound from the following spectral data with suitable explanation :

MF :  $\text{C}_6\text{H}_8\text{O}_4$

IR : 3010, 2880, 1730, 1650, 1228  $\text{cm}^{-1}$

NMR : 3.9 (s,6H), 6.1(s,2H)  $\delta$ ppm.

CMR( $\delta$ ) : 51.5, 133.6, 169.4

HRMS : 144.0423

- (B) Deduce the structure of the compound from the following spectral data with suitable explanation :

Mol.wt : 120

IR : 3050, 2950, 2720, 1714, 1605, 1500, 845 $\text{cm}^{-1}$

PMR : 2.3(s,3H), 6.95(d,2H), 7.5 (d,2H), 9.57 (s,1H) $\delta$ ppm.

Mass : 120,105, 77, 51

- 3 (A) Answer the following :

(1) Draw Jablonski diagram and explain all terms with example and uses.

(2) Explain Di- $\pi$  methane rearrangement with two supporting evidence.

(B) (1) Write short note on oxetane formation in suitable evidences.

(2) Explain Norrish type II reaction mechanism with suitable example.

- 4 (A) Give any two synthesis and four important reactions for Imidazole OR Thiazole.

(B) Give any two synthesis and four important reactions for Quinazoline OR Pyrazine.

- 5 Answer the following : (any three)

(1) What is Mannich base ? Discuss mechanism for the generation of Mannich base through acid and base catalyzed reaction with relevant sequential steps.

(2) Give a brief account on Suzuki Reaction.

(3) What is yield ? How phosphine yields are prepared ? Discuss the application of phosphorous yields in witting reaction.

(4) Give a brief account on Mitsunobu Reaction.

6 Answer the following : (any three)

- (1) Discuss the principle mechanism and synthetic applications of Stobbe condensation Reaction.
- (2) Give a brief account on Sonogashira Reaction.
- (3) Discuss the principle, mechanism and synthetic applications of the Villsmeyer-Haack reaction.
- (4) Give a brief account on Jones Oxidation.

7 Answer the following : (any three)

Discuss selectivity, mechanism and utilities of the following reagents.

- (1) LDA
- (2) Thionylchloride
- (3) Oxaziridine
- (4) 1,3 dithiane

8 Answer the following : (any three)

Discuss selectivity, mechanism and utilities of the following reagents.

- (1) 2,3 Dichloro 5,6 Dicyano benzo Quinone
- (2) Phase transfer catalysis
- (3) Gilman's Reagent - Lithium dimethyl cuprate.
- (4) Baker's yeast



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- (B)**
- (1) Write a note on the factors affecting the  $^{13}\text{C}$  chemical shift.
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**2 (A)** Answer the following :

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