

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

**MAY - 2017**  
**MSC0C202 (Sem - II)**  
**Organic Chemistry**

**Time : 3 Hrs.**

**Total Marks : 70**

- Instruction : (1) All Questions are Compulsory.  
(2) Figures to the right indicate total marks of the Questions.

1. (A) Answer the following.

- (1) Write a note on high resolution mass spectroscopy. 4  
(2) Write a note on the factors affecting the  $^{13}\text{C}$  chemical shift. 3

OR

- (1) Give all differences between  $^{13}\text{C}$  NMR and  $^1\text{H}$  NMR spectra.  
(2) Explain by appropriate example 'fragmentation', base peak and isotope peak'.

(B) Answer the following :

Deduce the structure of the compound from the following spectral data with suitable explanation: 7

Mol.wt : 152

IR : 3000(broad), 2900, 1720, 1650, 1378  $\text{cm}^{-1}$

NMR : 3.76 (s,3H), 6.9 (m,2H), 7.5 (m,1H), 7.8 (m,1H), 10.8 (s,1H)  $\delta$  ppm.

Mass : 153, 152, 121, 92, 65, 39

OR

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

Mol.wt : 130

IR : 2900, 1740, 1700, 1150, 1290, 1370  $\text{cm}^{-1}$

NMR : 1.2(t,3H), 2.2(s,3H), 3.4(q,2H), 3.1(s,2H)  $\delta$  ppm.

Mass : 130, 102, 87, 85, 57, 45, 43.

2. (A) Answer the following :

- (1) Draw Jablonski diagram and explain the term fluorescence and Phosphoresces with example and uses.  
(2) Explain Norrish type I reaction mechanism with suitable example.

OR

- (1) Write short note on oxetane formation in suitable evidences.  
(2) Write short note on photosensitization.

(B) Answer the following :

Give any two synthesis and four important reactions for Oxazole OR Isoxazole.

OR

Give any two synthesis and four important reactions for Quinoxaline OR Pyrazine.

3. Answer the following :

(A) Discuss the principle, mechanism, and synthetic applications of the following. 7

(1) Birch Reduction. (2) Stobbe Condensation.

OR

(1) Suzuki Reaction (2) Dickmann Reaction

(B) Discuss the principle, mechanism, and synthetic applications of the following. 7

(1) Buchwald Hartwig reaction. (2) Mitsunobu reaction.

OR

(1) Wittig reaction (2) Mannich reaction.

4. Answer the following :

(A) Discuss selectivity, mechanism and utilities of the following reagents 7

(1) Lithium diisopropylamide (LDA)

(2) Gilman's reagent-Lithium dimethylcuprate

OR

(1) 1,3 - Dithiane (Umpolung reagent)

(2) Sodium cyanoborohydride  $\{NaBH_3(CN)\}$

(B) Discuss selectivity, mechanism and utilities of the following reagents. 7

(1) Dicyclohexyl carbodiimide (DCC)

(2) Baker's yeast

OR

(1) Dess- Martin periodinane

(2) Phase transfer catalysis

5. Answer the following : 14

(1) Distinguish between base peak and molecular peak.

(2) What is off-resonance decoupled spectra.?

(3) What is McLafferty rearrangement ?

(4) Predict the approximate CMR values of p-Anisidine.

(5) Give structure of following compounds.

(i) pyrazino(2,3-C) pyridazine (ii) Imidazo (2,1-C) thiazole.

(6) Give one synthesis of Imidazole.

(7) What is Photolysis ?

(8) Outline spin forbidden selection rule in Photo-chemistry.

(9) What is Dickmann Condensation?

(10) What is Swern Oxidation.?

(11) Name the reagents and their function to carry out Vilsmeier Haack reaction.

(12) Give difference between reagents and catalyst.

(13) What is umpolung reagent ? Give one application of this reagent.

(14) Give preparation of DDQ reagent.