LOYOLA COLLEGE (AUTONOMOUS) CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION – **CHEMISTRY**

FIFTH SEMESTER – **NOVEMBER 2024**

UCH 5501 – ORGANIC FUNCTIONAL GROUPS - II

Date: 07-11-2024 Dept. No. Max. : 100 Marks

Time: 09:00 am-12:00 pm

SECTION A

Answer ANY FOUR of the following **4 x 10 = 40 Marks**

1. Write the mechanism of haloform and Micheal addition reactions.
2. Discuss the effect of substituents on the acidity of aliphatic and aromatic carboxylic acids with examples.
3. Illustrate the mechanism of pinacol-pinacolone and Beckmann rearrangements.
4. Propose any one method of preparation of cyanoacetic ester and describe any three of its synthetic uses.
5. How are the following organometallic compounds prepared? (3+3+4)
   (i) CH_3MgBr (ii) C_6H_5Li (iii) R_2CuLi
6. Give the mechanism of Cannizarro reaction and Clemmensen reduction.
7. Differentiate maleic acid from fumaric acid using different methods.
8. Write the *inter*- and *intra*-molecular mechanism of Fries rearrangement.

SECTION B

Answer ANY THREE of the following **3 x 20 = 60 Marks**

9. (a) Compare the mechanisms of reduction by $LiAlH_4$ and $NaBH_4$ with examples. (10)
   (b) Write the mechanism of Norrish type-I and type-II reactions. (10)
10. Write any two methods of preparation and three properties of the following compounds.
    (i) Oxalic acid (ii) succinic acid (10+10)
11. Explain the mechanism and salient features of the following rearrangements. (8+12)
    (i) Sigmatropic rearrangements with an example.
    (ii) Rearrangement involving alkyl isocyanate as reaction intermediate.
12. Discuss the preparation and any five synthetic applications of ethyl acetoacetate.
13. Illustrate the synthetic applications of Grignard reagents.
14. Discuss the mechanism of (8+6+6)
    (i) acid and base catalysed hydrolysis of an ester
    (ii) trans-esterification
    (iii) aldol condensation
