# LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

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

FIFTH SEMESTER – **APRIL 2023**

**16/17/18UCH5MC03 – ORGANIC FUNCTIONAL GROUPS-II**

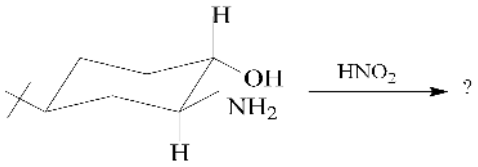
Date: 05-05-2023 Dept. No. Max. : 100 Marks

Time: 01:00 PM - 04:00 PM

## Part-A

***Answer ALL questions.*** **(10 × 2 = 20 Marks)**

1. What are active methylene compounds? Give an example.
2. What is haloform reaction?
3. Why is trifluoroacetic acid is more acidic than acetic acid?
4. Give the structure of lactic acid and pyruvic acid.
5. Give evidence for the intermediacy of a carbocation in pinacol-pinacolone rearrangement.
6. Predict the major rearranged product in the following:



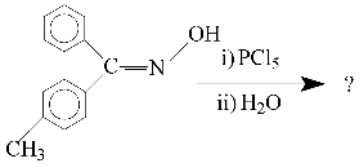

7. What is keto-enol tautomerism? Give any one example.
8. How will you convert ethyl aceto acetate into crotonic acid?
9. How is Grignard reagent prepared?
10. What is Gilmann reagent? Mention any one of its uses.

## Part-B

***Answer any EIGHT questions.*** **(8 × 5 = 40 Marks)**

11. Write the mechanism of the following reactions:
    (i) Wittig reaction(ii) Micheal addition
12. Explain the mechanism and salient features of Cannizarro reaction.
13. Illustrate the factors influencing the acidity of carboxylic acids with examples.
14. How are the following compounds prepared?
    (i) Adipic acid (ii) Crotonic acid.
15. Write any one method of preparation for the following compounds:
    (i) Acid chloride (ii) Amine and (iii) Acid anhydride.

16. Complete the following rearrangement with mechanism.




17. Write the mechanism for the following reaction.

$$RCOOH + HN_3 \xrightarrow{H_2SO_4} R\,NH_2 + CO_2 + N_2$$

18. Explain the salient features and write the mechanism of Claisen and para-Claisen rearrangement.
19. Discuss the mechanism of the following conversions:
    (i) Diethyl malonate into 2-methyl butanoic acid (ii) diethyl malonate into adipic acid
20. Explain any three synthetic applications of acetoacetic ester with mechanism.
21. Explain any five synthetic applications of diazomethane.
22. How will you prepare primary, secondary and tertiary alcohols using $CH_3MgBr$?

## Part-C

***Answer any FOUR questions.*** **(4 × 10= 40 Marks)**

23a. Discuss the mechanism of Norrish Type-I & II reactions with suitable examples. **(6)**

b. Give the mechanism of benzoin condensation reaction. **(4)**

24a. Explain the mechanism of acid and alkaline hydrolysis of an ester. **(6)**

b. Write any two stereospecific addition reactions to maleic and fumaric acids. **(4)**

25a. When an unsubstituted amide is treated with an alkaline solution of bromine, a primary amine with one carbon atom less is obtained. Discuss the mechanism of the reaction. **(5)**

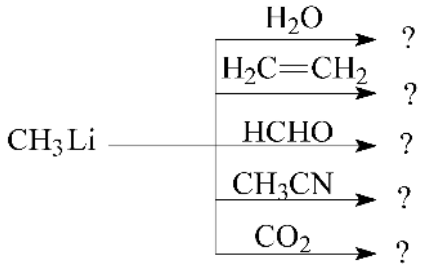
b. Write a reaction mechanism for ring-contraction and ring-expansion using pinacol-pinacol rearrangement. **(5)**

26a. Outline the mechanism of intra-molecular rearrangement of Fries rearrangement. **(4)**

b. Write any one method of preparation for the following compounds:
(i) Diethyl malonate (ii) Cyanoacetic ester (iii) Diazoacetic ester **(6)**

27. What happens when $CH_3MgBr$ reacts with the following compounds? Give mechanism.
    (i) HCHO (ii) $CH_3CHO$ (iii) $CH_3CN$ (iv) $CO_2$ (v) Ethylene oxide

28. Predict the product in the following reactions.

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