LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

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

THIRD SEMESTER – **APRIL 2023**

16/17/18UCH3MC02 – STEREOCHEMISTRY AND ORGANIC FUNCTIONAL GROUPS-I

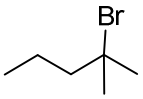
Date: 04-05-2023 Dept. No. Max. : 100 Marks

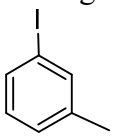
Time: 01:00 PM - 04:00 PM

PART-A

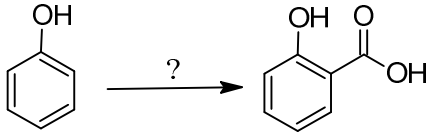
Answer ALL questions **(10 x 2 = 20 Marks)**

1. What is optical isomerism? Differentiate between optical and specific rotations.
2. Provide two examples of compounds having atropisomerism.
3. Give the IUPAC name for the following compounds.

i. 

ii. 

4. Mention the significance of haloform reaction.
5. How will you do the following conversion.

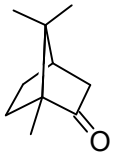


6. Draw the structure of 18-crown-6 compound.
7. Why ethers storage is risky for a longer period?
8. Exemplify the significance of hyroboration and oxidation reaction.
9. How are nitro compounds classified?
10. Suggest any two methods of preparation for nitro compounds.

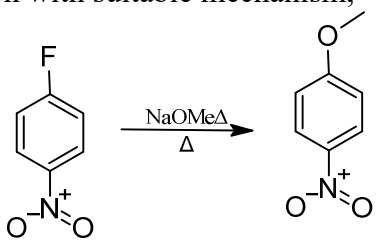
PART-B

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

11. Identify the chiral centers and assign with R & S notation.



12. Delineate the methods used for the resolution of racemic compounds.
13. Examine the free radical substitution mechanism. Outline the difference between free radical mechanism with other types of mechanisms.
14. Rationalise the following conversion with suitable mechanism,



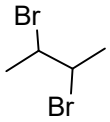
15. Describe the industrial manufacturing process of phenol.
16. Assess the mechanism of aromatic electrophilic substitution reactions. Why do aromatic compounds prefer substitution rather than addition reactions?
17. How will you convert phenol into salicylaldehyde? Explain.
18. Suggest any two methods of epoxide preparations.
19. Write a note on the classification of ethers with examples.

20. Discuss the general properties of nitro compounds.
21. Demonstrate the application of coupling reactions with examples.
22. Exemplify the utility of Sandmeyer and Gotterman reactions.

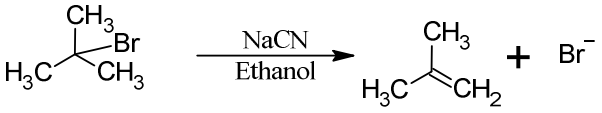
PART-C

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

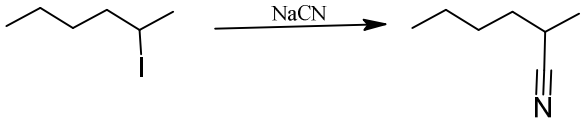
23. a) Examine the different methods used for asymmetric synthesis. (5)
    b) Depict the following compound with different illustration methods. (5)



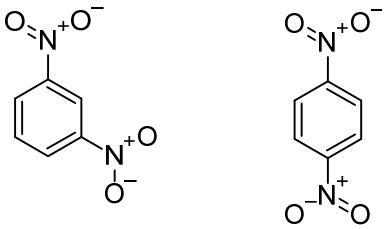
24. a) Write a note on chirality in organic compounds. Outline the significance of chirality in general. (5+5)
    b) Assess the orientation and stereochemical outcome in E1 and E2 elimination reactions.
25. Investigate the mechanisms involved in the following conversions. (5+5)
    i.



    ii.



26. a) Classify the reactions of alcohols and exemplify each class of reactions with examples.
    b) Analyse the mechanism of sulphonation of phenol. (5+5)
27. a) Describe the different methods used for the preparation of aliphatic and aromatic ethers. (5)
    b. Write note on organometallic reagents. (5)
28. a) How will you prepare the following compounds? (3+3)



    b) Investigate the effect of substituents on the basicity of amines. (4)
