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Name.....

Reg. No.....

**FOURTH SEMESTER (CBCSS—UG) DEGREE EXAMINATION  
APRIL 2024**

Chemistry

CHE4B04—ORGANIC CHEMISTRY—I

(2019 Admission onwards)

Time : Two Hours

Maximum : 60 Marks

**Section A (Short Answers)***Answer questions up to 20 marks.**Each question carries 2 marks.*

1. What is Inductive effect ? Illustrate -I effect with one example.
2. Explain the significance of hydrogen bonding in the anomalous behaviour of water.
3. Among the two types of carbene, which is more stable and why ?
4. What are meso compounds ? Draw the Fischer Projection formula of meso-tartaric acid.
5. Draw the flying wedge formulae of R and S - glyceraldehyde.
6. Depict the conformational energy diagram for n- butane.
7. What is Huckel's Rule of aromaticity ? Illustrate with an example.
8. The  $pK_a$  of cyclopentadiene is 15. Describe the reason for the low  $pK_a$ .
9. Which is more basic, pyridine or pyrrole? Draw the structures and explain.
10. Compare the aromaticity of azulene and naphthalene.
11. Explain with necessary equations, the mechanism of nitration of benzene.
12. What is Friedel-Crafts acylation reaction ?

(Ceiling 20 marks)

**Section B (Paragraph Questions)***Answer questions up to 30 marks.**Each question carries 5 marks.*

13. How electron displacement effects play a role in the stability of alkenes ?
14. Arrange the following in the order of increasing basic nature: Aniline, p-nitroaniline, p-toluidine. Justify your answer.

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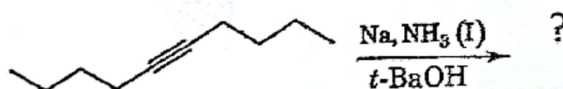
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15. Explain with necessary equations the compounds you would use to resolve the racemic mixture of (a) 2-phenylethylamine and (b) tartaric acid.
16. Differentiate between SN1 and SN2 mechanisms of substitution at saturated carbon.
17. Predict the product formed during the reaction of but-1-yne with ozone. Explain with mechanism.
18. How reactive are the different sites in toluene? Comment on the relative yields of the products formed in the reaction of toluene with  $\text{HNO}_3$  and  $\text{H}_2\text{SO}_4$ . Justify the answer with mechanism.
19. Write a short note on stability of benzene using MO theory.

(Ceiling 30 marks)

**Section C (Essay)***Answer any one question.**The question carries 10 marks.*

20. Arrange the different conformers of cyclohexane in the order of decreasing stability. Explain the reason for the stability of the cyclohexane conformers.
21. (a) Give any two preparation methods of alkenes.
- (b) Write a short note on Anti-Markownikov addition of alkyl halides.
- (c) Predict the product and explain the stereochemistry of the following reaction



(1 × 10 = 10 marks)