

**B. Sc DEGREE END SEMESTER EXAMINATION - OCT. 2020 : JANUARY 2021****SEMESTER 3 : CHEMISTRY**COURSE : **19U3CRCHE3 : ORGANIC CHEMISTRY - I***(For Regular - 2019 Admission)*

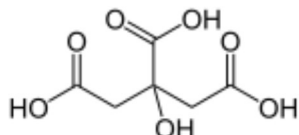
Time : Three Hours

Max. Marks: 60

**PART A****Answer All (1 mark each)**

1. Explain why chloramine is a weaker base than ammonia but chloroacetic acid is stronger acid than acetic acid?
2. An object lacking plane of symmetry is called .....
3. What do you understand by axial and equatorial hydrogen in cyclohexane ?
4. Draw the structure of D-Threose.
5. The catalyst used in the nitration of benzene is
6. What is Benzyne?
7. The electrophile generated in the Chlorination of benzene is

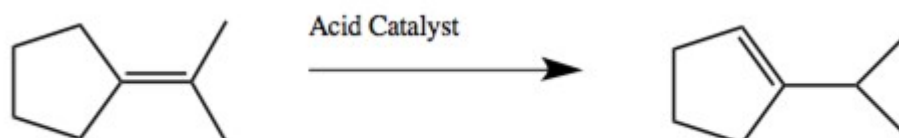
8.



Give the IUPAC name of the above compound

**(1 x 8 = 8)****PART B****Answer any 6 (2 marks each)**

9. Explain homolytic and heterolytic fission with examples
10. Classify the following reactions as addition, elimination, substitution, or rearrangement



11. 3 g of an enantiomer is dissolved in ethanol to make 100 mL solution. Find out the specific rotation at 20 °C for sodium light (the D line) if the solution has an observed rotation of +2.10° in 10 cm polarimeter tube.
12. Define the terms (i) Dihedral angle (ii) Torsional strain
13. Draw the erythro and threo forms of 3-bromo-2-butanol
14. What are Wheland Intermediate?

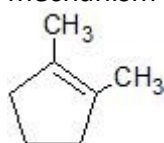
15. Explain the reaction between benzene and benzoylchloride in the presence of anhydrous  $\text{AlCl}_3$ .
16. Write the Structural formulae of the following compounds  
a) 2,4,5,5-tetramethyl-3-hexanone b) 3,4,5-trimethylheptanoicacid

**(2 x 6 = 12)**

### PART C

**Answer any 4 (5 marks each)**

17. Explain why racemization is not 100% in case of  $\text{S}_{\text{N}}^1$  reaction ?
18. One of the products that results when 1-bromo-2,2-dimethylcyclopentane is heated in ethanol is shown below. Give a mechanism by which it is formed and give the name of this mechanism



19. Explain why the chair conformation of cyclohexane is more stable than boat conformation?
20. Explain the term optical activity with an example. Discuss the requirement for a compound showing optical activity.
21. Discuss the molecular orbital structure of benzene.
22. Discuss the general mechanism of electrophilic substitution in benzene.

**(5 x 4 = 20)**

### PART D

**Answer any 2 (10 marks each)**

23. How do you account for the relative stability of primary, secondary and tertiary alkyl carbocations?
24. Discuss the various factors influencing the rate of nucleophilic substitution and elimination reactions. How will you differentiate between  $\text{S}_{\text{N}}^1$  and  $\text{S}_{\text{N}}^2$  substitution reactions ?
25. Taking tartaric acid as example illustrate the differences between enantiomers, diastereomers and meso compounds.
26. State and Explain Huckel's rule. Account for the aromaticity of Cyclopentadienyl anion and tropylium cation by this rule.

**(10 x 2 = 20)**