Reg. No ..... Name **24U326**

B.Sc. DEGREE END SEMESTER EXAMINATION - OCTOBER 2024

SEMESTER 3 : CHEMISTRY

COURSE : **19U3CRCHE3 : ORGANIC CHEMISTRY - I**

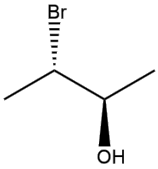
(For Regular 2023 Admission and Improvement/Supplementary 2022/2021/2020/2019 Admissions)

Time : Three Hours Max. Marks: 60

PART A

Answer All (1 mark each)

1. Give the order of preference for naming organic compounds for the following: Double bond, Triple bond, Substituent.
2. Write the Structural formulae of the following compound
   Hept-1-en-3-yne
3. Write the Structural formulae of the following compound
   Oct-2-en-6-yn-1-ol
4. Why is CH_2=CH-$^+CH_2$ is more stable than $CH_3CH_2{}^+CH_2$?
5. The number of optical isomers possible for the compound CH_3-CHCl-COOH?
6. Check whether the given molecule is eryhtro or threo.



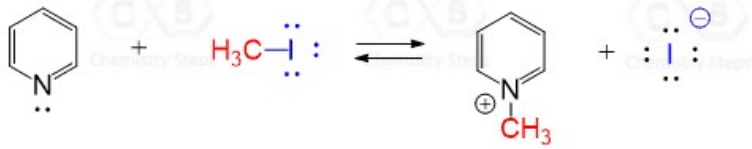
7. Identify the expected product of the reaction between CH_2=CH-CH_3 and H_2O in presence of Al_2O_3. Write down the equation for the reaction.
8. In strongly acidic medium, aniline exists mainly as ……

(1 x 8 = 8)

PART B

Answer any 6 (2 marks each)

9. Is 1,3-cyclobutadiene and 1,3,5,7-cyclooctatetraene aromatic or non-aromatic? Explain.
10. 3 g of an enantiomer is dissolved in ethanol to make 100 mL solution. Find out the specific rotation at 20 ^oC for sodium light (the D line) if the solution has an observed rotation of +2.10^o in 10 cm polarimeter tube.
11. Use curved arrow notation to show how each reaction and resonance structure conversion can be achieved:



12. Write the Structural formulae of the following compounds
    a) 3-ethyl-2,4-dimethylpentane and b) 4-isopropyl-5-methyloctane
13. Which is more stable, 2 - butene orl-butene? Explain.
14. Explain the term principal axis of rotation by taking benzene as example.
15. Draw the Newmann projection formulae for ethane.
16. Draw the structure of bicyclo (4. 3. 1) decane.

(2 x 6 = 12)

PART C

Answer any 4 (5 marks each)

17. Discuss the geometrical isomersim in aldoximes and ketoximes.
18. For each pair, determine if they are resonance structures of each other or not. If they are, draw the curves arrow(s) to confirm the movement of electrons.

a)

b)

c)

d)

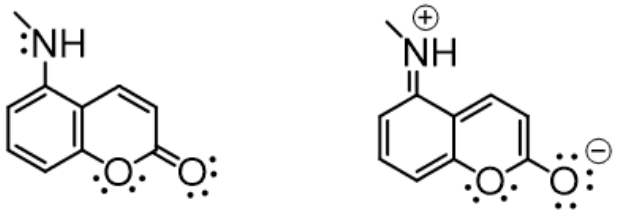
e)

f)

g)

h)

i) 

j) 

19. Account for the aromaticity of Cyclopropenyl cation and Cyclopentadienyl anion.
20. Distinguish between Enantiomers and Diastereomers.
21. Explain how Heat of Combustion and Heat of Hydrogenation of benzene interpret its structure.
22. Explain aromatic and non-aromatic compounds with examples.

(5 x 4 = 20)

PART D

Answer any 2 (10 marks each)

23. Explain the following with reasons
    a) Carboxylic acids do not give reactions of carbonyl group
    b) *p*- Nitrophenol is a stronger acid than alcohol
    c) Phenol is a stronger acid than an alcohol
    d) Aniline is a weaker base than cyclohexyl amine
    e) Aniline is a stronger base than *p*-nitroaniline
24. Discuss in detail mechanism of halogenation and nitration of benzene.
25. Explain the different racemization and resolution methods.
26. Discuss the various factors influencing the rate of nucleophilic substitution and elimination reactions. How will you differentiate between S_N1 and S_N2 substitution reactions ?

(10 x 2 = 20)