C 3518 (Pages : 2) Name.....

Reg. No.....

FOURTH SEMESTER (CBCSS—UG) DEGREE EXAMINATION, APRIL 2021

Chemistry

CHE 4B 04—ORGANIC CHEMISTRY-I

Time : Two Hours Maximum : 60 Marks

Section A (Short Answers)

Answer at least **eight** *questions.*
Each question carries 3 *marks.*
All questions can be attended.
Overall Ceiling 24.

1. What are the limitations of Kekule's structure ?
2. Which compound is easily nitrated- benzene or nitrobenzene ? Substantiate your answer.
3. What is Birch reduction ?
4. Why-OH group is ortho- para orienting ?
5. Predict the product in the nitration of methyl benzene.
6. State and explain Saytzeff's rule.
7. Explain the aromaticity of tropylium ion on the basis of Huckel's rule.
8. What are annulenes ? Give two examples of annulenes that are aromatic.
9. Is anthracene aromatic ? Justify your answer.
10. What are carbenes ? Give two examples.
11. Which is a stronger acid ? Acetic acid or formic acid ?
12. What are the consequences of intermolecular hydrogen bonding ?

(8 × 3 = 24 marks)

Section B (Paragraph)

Answer at least **five** *questions.*
Each question carries 5 *marks.*
All questions can be attended.
Overall Ceiling 25.

13. Draw the Newman projections of conformers of butane. Represent the stability of the conformers in a potential energy diagram.
14. Distinguish between enantiomers and diastereomers.

Turn over

15. What is steric effect ? Explain its effect in determining the basicity of 1°, 2°, 3° amines.

16. Discuss hyperconjugation and its significance with illustrative examples.

17. What is meant by Kharasch effect ? Explain the mechanism with an example.

18. Explain the hydroboration-oxidation reaction of alkenes with a suitable example.

19. Halogens are electron withdrawing yet they direct the incoming electrophile to ortho -para positions. Why ?

(5 × 5 = 25 marks)

Section C (Essays)

Answer any **one** *question.*

The question carries 11 *marks.*

20. Discuss the different methods of resolution of a racemic mixture.

21. Illustrate the stereochemical aspects of S_N1 and S_N2 mechanisms. Also discuss the effect of substrate structure, solvent, nucleophile and leaving group.

(1 × 11 = 11 marks)

C 2171 (Pages : 3) Name.....

Reg. No.....

FOURTH SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION
APRIL 2021

Chemistry

CHE 4B 04—ORGANIC CHEMISTRY—I

Time : Three Hours Maximum : 80 Marks

Section A (One Word)

Answer **all** *questions.*
Each question carries 1 *mark.*

1. A tertiary carbocation is ———— stable than primary carbocation.
2. 1-butene and 2-butene are ———— isomers.
3. Represent the functional group of ether.
4. Baeyer's reagent is ————.
5. Give one example for non-benzenoid aromatic compounds ?
6. Draw the two flipped cyclohexane structure in chair form.
7. Which isomer is having zero dipole moment ? Cis -2-butene or trans-2-butene ?
8. Draw the stable conformation of ethylene glycol.
9. Hybridization of carbene (triplet) intermediate————.
10. 1-Butyne is ———— acidic than 2-Butyne.

(10 × 1 = 10 marks)

Section B (Short Answers)

Answer any **ten** *questions.*
Each question carries 2 *marks.*

11. Define specific rotation ?
12. Represent tartaric acid in Fischer projection.
13. "Ortho-nitro phenol is more acidic than meta-nitro phenol". Justify your answer ?
14. Discuss ring flipping with suitable examples ?

Turn over

15. Explain Anti-Markownikov addition reaction.

16. Arrange the compounds in order of decreasing reactivity toward aromatic electrophilic substitution : Benzene, phenol, toluene, nitrobenzene.

17. Explain Keto-enol tautomerism with proper examples.

18. What are Anti-aromatic compounds ? Give examples.

19. Arrange the carbocation given in their increasing stability order CH_3^+, $C_2H_5^+$, $(CH_3)_3C^+$. Justify.

20. Write the products obtained on sulphonation of naphthalene at different temperatures.

21. Write the products when 2-Butyne reacts with H_2/Lindlar catalyst.

22. Explain the term enantiomeric excess.

(10 × 2 = 20 marks)

Section C

Answer any **five** *questions.*
Each question carries 6 *marks.*

23. Give the mechanism of halogenation of benzene.

24. What are Carbanions ? Discuss the stability of carbanions.

25. Explain the mechanism of dehydration of alcohols.

26. Discuss the conformations of n-butane with proper energy profile diagram.

27. Define Hyperconjugation. How it can be used to compare stability of 1-butene and 2-butene ?

28. Discuss the mechanism of addition of water into alkene with proper examples.

29. State Huckel's $(4n + 2)$ rule. Explain the aromatic character of indole and quinoline.

30. Write a short note on 1, 4 addition of 1, 3-butadiene and Diels Alder reaction.

(5 × 6 = 30 marks)

Section D

Answer any **two** *questions.*
Each question carries 10 *marks.*

31. a) Write a brief note on :

1) Freund reaction ; and 2) Ozonolysis reaction.

b) Discuss Haworth synthesis of naphthalene ?

(6 + 4 = 10 marks)

32. a) Discuss the definition, structure, hybridization of carbocation intermediate.

b) Discuss the stereochemistry of addition of halogens into alkene with proper examples.

(6 + 4 = 10 marks)

33. a) Write a detailed comparison note on basicity of pyrrole and pyridine.

b) Discuss in detail about ring activating and deactivating group with proper examples.

(5 + 5 = 10 marks)

34. a) Define mesomeric effect ? Give examples for + M and – M groups and also compare the basicity of aniline and p-nitroaniline.

b) Discuss the structure and stability of benzene based on M O concepts ?

(5 + 5 = 10 marks)

[2 x 10 = 20 marks]

D 103031 **(Pages : 2)** **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 *pKa* of cyclopentadiene is 15. Describe the reason for the low *pKa.*
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.

Turn over

15. Explain with necessary equations the compounds you would use to resolve the racemic mixtures 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-l-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 HNO_3 and H_2SO_4. Justify the answer with mechanisms.

19. Write a short note on stability of benzene using MO theory.

(Ceiling 30 marks)

Section C (Essay)

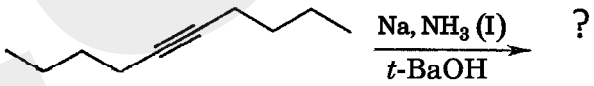
Answer any **one** *question.*
The question carries 10 *marks.*

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)