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1B4A23146 (Pages : 3) Reg. No:.....

Name: .....

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

Fourth Semester B.Sc Chemistry Degree Examination, April 2023

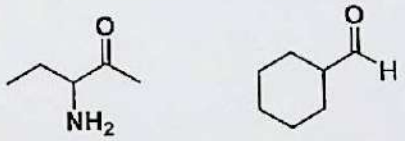
BCH4B04 – Organic Chemistry – I

(2019 Admission onwards)

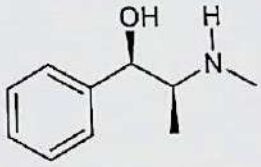
Time: 2 hours Max. Marks: 60

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

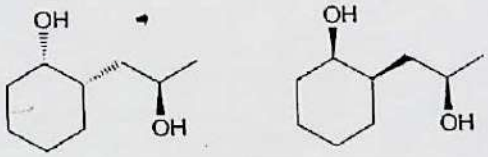
1. Distinguish between Hyperconjugative and mesomeric effects
2. Among 2,2-Dimethylbutane and 2-methyl pentane which one have higher boiling point? Why?
3. Identify the potential H-bond donors and H-bond acceptors in each of the following molecules



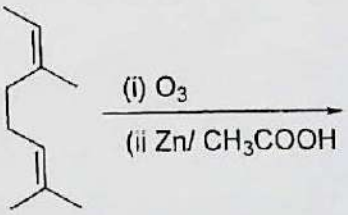
4. Identify the configurations(R/S) of the chiral centres in the following molecule



5. Identify whether the following pair of compounds are enantiomers or diastereomers. Why?



6. Calculate the enantiomeric excess of a mixture compound containing 94% R isomer and 6% S isomer?
7. How will you convert But-2-yne to (i) cis -2-butene and (ii) trans 2-butene
8. Predict the products in the following reaction



9. pKa value of ethylene is 44 while that of acetylene is 25. Comment

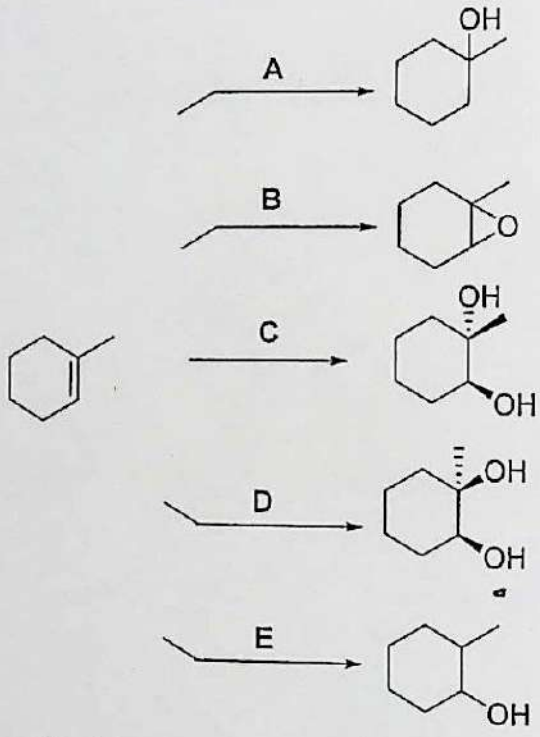
10. State and explain the Huckel' rule of aromaticity
11. Draw the resonance structures of tropylium ion
12. Provide the structures of Azulene and cyclopentadienyl anion. Identify whether they aromatic or not?

[Ceiling of marks: 20]

Section B (Paragraph)

(Answer questions up to 30 marks. Each question carries 5 marks)

13. Briefly discuss the types, structure and stability of carbocations and carbenes
14. Distinguish between Mesomeric and Electromeric effect. Explain +E and –E effect in reactions using appropriate examples.
15. Provide the Fischer, Flying wedge, Sawhorse and Newman projectionsof (2R,3S)-3-bromo-2 butanol
16. Discuss mechanisms of E1 & E2 Elimination reactions
17. Identify the reaction conditions A-E in the following



18. Discuss the mechanism of sulphonation of Benzene
19. What is meant by orientation effect in Aromatic electrophilic substitution reactions. Discuss the orientation effect of Nitro group and methoxy group

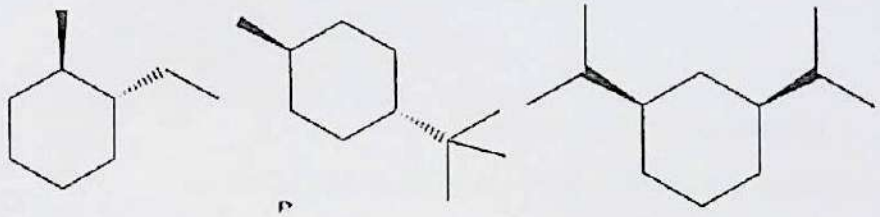
[Ceiling of marks: 30]

Section C (Essay)

(Answer any one. Each question carries 10 marks)

20. (a) Discuss the salient features of Baeyer's strain theory

(b) Draw both the chair conformations of each of the following compounds



21. Distinguish between S_N1 and S_N2 reactions. Discuss the effects of substrate structure, solvent, nature of the nucleophile and nature of the leaving group on the rate of S_N1 and S_N2 reactions

[1 x 10 = 10]

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FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

Fourth Semester B.Sc Degree Examination, April 2023

BCH4C04 – Physical and Applied Chemistry

(2019 Admission onwards)

Time: 2 hours Max. Marks: 60

Section A (Short answers)

(Answer questions up to 20 marks. Each question carries 2 marks)

1. Among Na^{+}, Al^{3+} and Mg^{2+},which ion is having highest coagulating power? Why?
2. Explain delta formation.
3. What are green solvents? Give an example.
4. Give two applications of nanomaterials in medicine.
5. Draw the labeled schematic diagram of NMR spectrum of acetone.
6. How is Nylon 66 prepared?
7. What is the importance of R_f value in planar chromatography?
8. Give two applications of gas chromatography.
9. Sketch the vibrational modes of H_2O that are observed in IR spectrum.
10. Distinguish between bioaccumulation and biomagnification.
11. What are analgesics? Give an example.
12. Write the important requirements of a dye.

[Ceiling of marks: 20]

Section B (Paragraph)

(Answer questions up to 30 marks. Each question carries 5 marks)

13. Give a brief account of the origin of charge and electrical properties of colloids.
14. Explain the principle and the technique of adsorption column chromatography.
15. State Beer-Lambert's law. Explain the application of electronic spectroscopy in quantitative analysis.

16. Explain the terms chemical shift and spin-spin coupling with reference to NMR spectroscopy.

17. Why biodegradable polymers are preferred over non-biodegradable polymers? Name any two biodegradable polymers and discuss their applications.

18. State the principles of green chemistry.

19. Discuss the composition and uses of LPG and CNG.

[Ceiling of marks: 30]

Section C (Essay)

(Answer any one. Each question carries 10 marks)

20. (a) Write a note on depletion of ozone layer and its impacts.

    (b) Explain BOD and COD

21. (a) Explain the terms chemical name, generic name and trade name as applied to drugs with illustrative examples.

    (b) Write a short note on different types of glasses and their uses.

[1 x 10 = 10]