LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION – **CHEMISTRY**

SECOND SEMESTER – **APRIL 2023**

CH 2504 – HYDROCARBONS AND STEREOCHEMISTRY

Date: 10-05-2023 Dept. No. Max. : 100 Marks

Time: 09:00 AM - 12:00 NOON

Part A

Answer ALL the questions. **10×2 =20 marks**

1. State Huckel's rule.
2. Tertiary carbocations are more stable than secondary carbocations. Justify.
3. How will you convert benzene into cyclohexane?
4. What is called cracking in petroleum industry?
5. Define Saytzeff rule.
6. Predict the product formed in the ozonolysis of 2-Pentyne.
7. Write an equation for the Friedel-Crafts alkylation reaction of benzene.
8. Draw the structure of phenanthrene.
9. List any two important uses of naphthalene.
10. What is called tortional strain?

Part B

Answer any EIGHT questions. **8×5= 40 marks**

11. Define tautomerism. Explain amido-imidol tautomerism with an example.
12. Differentiate between inductive effect and electromeric effect.
13. State Huckel's rule and mention its prerequisites.
14. Describe the mechanism and limitations of Wurtz reaction in the synthesis of alkanes with examples.
15. Discuss the free radical mechanism of bromination of alkane.
16. Explain the relative stability of conjugated dienes over isolated dienes.
17. Predict the product formed in the hydroboration –oxidation reaction of alkyne.
18. How will you synthesis cycloalkanes by Dieckmann's method?
19. Discuss the mechanism for the sulphonation reaction of benzene.
20. Explain Haworth's synthesis of anthracene.
21. What are conformers? Describe the different conformations of n-butane with energy diagrams.
22. Explain any three methods used to distinguish between cis and trans isomers.

Part C

Answer any FOUR questions. **4×10 =40 marks**

23. a) What is hybridization? Explain the structure of methane, water and ammonia using sp^3 hybridization.

    b) Explain any two factors affecting the magnitude of bond length. (6+4)

24. a) Describe the two different types of resonance effect with example.

    b) Write the important postulates of Bayer's strain theory. (4+6)

25. a) Describe the ring opening reactions of cycloalkanes with example.

    b) Write note on Ziegler Natta Polymerization reaction. (6+4)

26. Predict the mechanism for the electrophilic addition of halogens and hydrogen halides with alkynes.

27. a) How will you prepare the following from acetylene?

    (i) Benzene (ii) Glyoxal (iii) Propyne

    b) Explain the acidic nature of acetylene. (6+4)

28. Describe in detail the conformational analysis of cyclohexanes.

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