

18U408

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Name:

Reg. No.

FOURTH SEMESTER B.Sc. DEGREE EXAMINATION, APRIL 2020

(CUCBCSS-UG)

(Regular/Supplementary/Improvement)

CC15U CHE4 B04 - ORGANIC CHEMISTRY I

(Chemistry - Core Course)

(2015 Admission onwards)

Time: Three Hours

Maximum: 80 Marks

Section A (One word)

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

1. Structure of the enol form of acetone is _____
2. Most stable conformation of methyl cyclohexane is _____
3. Draw the structure of an optically active biphenyl molecule.
4. Homolysis of carbon carbon bond in ethane generates _____
5. The order of stability of primary, secondary and tertiary carbocation is _____
6. Dehydration of 3-methylbutan-2-ol yields _____ as the major product.
7. Ozonolysis of _____ yields propanone as the single product.
8. Metal used in Freund reaction is _____
9. An example for a carcinogenic polycyclic aromatic hydrocarbon is _____
10. An example for antiaromatic compound is _____

(10 x 1 = 10 Marks)

Section B (Short Answer Type)

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

11. What do you mean by homologous series? Write one example.
12. Draw the Sawhorse and Newman projection formulae of staggered ethane molecule.
13. What do you mean by resolution?
14. Draw the structure of the enantiomers of tartaric acid.
15. Explain the term electromeric effect.
16. Give any two reactions given by carbenes.
17. What is Saytzeff's rule?
18. What is Diels-Alder reaction?
19. Draw the resonance structures of benzene. Include both Kekule and Dewar structures.
20. Is tropylium cation aromatic? Explain using Huckel's rule.
21. What are the products formed when naphthalene is (a) nitrated (b) sulphonated?

22. How will you synthesise 2-butyne?

(10 x 2 = 20 Marks)

Section C (Paragraph Type)

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

23. Discuss Baeyer's strain theory. What are its merits and demerits?
24. Taking suitable examples illustrate the Cahn-Ingold-Prelog rules for assigning R S configuration of chiral molecules.
25. Discuss the curved arrow formalism in depicting reaction mechanism.
26. Explain oxymercuration-demercuration reaction of alkenes with suitable example.
27. Explain any two methods for *cis* hydroxylation of alkenes.
28. Explain the mechanism of HBr addition to alkene in presence of organic peroxide.
29. Discuss the mechanism of sulphonation of benzene.
30. Compare the basicities of (i) pyrrole and pyridine (ii) indole and quinoline

(5 x 6 = 30 Marks)

Section D (Essay Type)

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

31. Discuss the methods for distinguishing geometrical isomers.
32. Explain the following.
- | | |
|------------------------|-------------------------|
| a) Racemization | b) Resolution |
| c) Enantiomeric excess | d) Asymmetric synthesis |
33. What is hyperconjugation? Discuss its characteristics. Using hyperconjugation compare the stabilities of (a) 1-butene and 2-butene and (b) toluene, ethyl benzene and *tert*-butyl benzene.
34. What do you mean by orientation effect in electrophilic aromatic substitution? Explain the directive influence of groups in such substitution reactions.

(2 x 10 = 20 Marks)
