18P112 (Pages: 2) Name: …….

Reg. No……...

FIRST SEMESTER M.Sc. DEGREE EXAMINATION, NOVEMBER 2018

(Regular/Supplementary/Improvement)

(CUCSS-PG)

CC15P CH1 C03 - STRUCTURE AND REACTIVITY OF ORGANIC COMPOUNDS

(Chemistry)

(2015 Admission onwards)

Time: 3 Hours Maximum: 36 Weightage

Section A

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

1. What are electron donor-acceptor complexes? Give an example for EDA complexes in which the acceptor is an organic molecule.
2. What is cross-conjugation? Illustrate with an example.
3. What are *ylides*? Draw the general structure of a nitrogen *ylide*.
4. What is Bell-Evans-Polanyi principle?
5. Explain the term "antiaromaticity". Give one example.
6. Among 2-phenethyl acetate and propyl acetate, which will readily undergo solvolysis? Why?
7. Menthyl chloride is less susceptible to elimination reactions than neomenthyl chloride. Explain.
8. *trans*- Decalin is conformationally rigid. Give reason.
9. Differentiate between homotopic and enantiotopic hydrogens with suitable examples.
10. What is a chiral pool synthesis?
11. Define optical purity. How is it related to percentage enantiomeric excess?
12. Identify and sketch the *Re*-and *Si*- faces of 2- butanone.

(12 x 1 = 12 Weightage)

Section B

Answer any ***eight*** questions. Each question carries 2 weightage.

13. Explain homoaromaticity with a suitable example. Also explain how NMR is useful in finding homoaromaticity.
14. Draw the energy profile diagrams for kinetically and thermodynamically controlled reactions.
15. What are acidity functions? Explain.
16. State and explain Bredt's rule. What is its structural basis?

17. Explain the factors affecting the conformational stability of molecules with suitable examples.
18. Explain the effect of conformation on the course and rate of esterification of isomeric menthols.
19. Discuss optical activity in biphenyls. How [R]/[S] is assigned for optically active biphenyls.
20. Draw the stereoisomers of tartaric acid and assign [R]/[S] for the chiral centers.
21. Explain the different classes of asymmetric reactions.
22. Using Cram's rule and Felkin-Anh model, explain 1, 2-asymmetric induction.
23. Explain the stereochemistry of Sharpless asymmetric epoxidation.
24. Explain Marcus theory and its significance.

(8 x 2 = 16 Weightage)

Section C

Answer any ***two*** questions. Each question carries 4 weightage.

25. Explain
    (i) Aromaticity of 8- and 10- annulenes.
    (ii) Effect of hydrogen bonding on physical and chemical properties of organic compounds.
26. Explain (i) Linear free energy relationships and their significance in studying reactivity of organic compounds (ii) Curtin- Hammet principle and its significance.
27. What are the conditions for optical activity? Explain with suitable examples the different kinds of molecules which display optical activity.
28. Explain the stereochemical outcome of aldol reaction, using Zimmermann- Traxler model.

(2 x 4 = 8 Weightage)

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