20P112 (Pages: 2) Name: …….

Reg. No……...

FIRST SEMESTER M.Sc. DEGREE EXAMINATION, NOVEMBER 2020

(CBCSS-PG)

(Regular/Supplementary/Improvement)

CC19P CHE1 C03 – STRUCTURE AND REACTIVITY OF ORGANIC COMPOUNDS

(Chemistry)

(2019 Admission onwards)

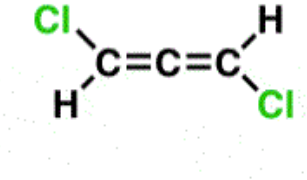
Time: Three Hours Maximum: 30 Weightage

Section A

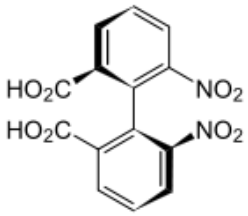
Answer any ***eight*** questions. Each question carries 1 weightage.

1. Comment on the aromaticity of cyclooctatetraene, its dianion and dication.
2. What is meant by resonance energy?
3. Write a note on the importance of Marcus equation.
4. Differentiate between homotopic and enantiotopic hydrogens with suitable examples.
5. Assign the absolute configuration of following molecules.

a)



b)



6. Give the structure of the major product of the reaction between (R)-CH_3-CO-$CH(CH_3)$Ph with CH_3CH_2MgBr using Felkin-Ahn Model.
7. Draw the preferred conformations of (a) 2-chloro hexanone (b) 2-bromo-4,4-dimethyl cyclohexanone.
8. Compare the rate of chromic acid oxidation of *cis* and *trans* 4-t-butylcyclohexanol.
9. Explain why first ionization of maleic acid occurs more readily than that of fumaric acid.
10. Explain Bredt's rule with suitable example.

(8 x 1 = 8 Weightage)

Section B

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

11. Write a note on aromaticity of [8] and [10] annulenes.
12. Compare the rate etherification of isomenthol, neomenthol, isoneomenthol.
13. Explain Curtin-Hammett principle. Illustrate its application with suitable example.
14. Write a brief note on different chemical methods of resolution.

15. Discuss the different methods used for the determination of configuration of geometrical isomers in acyclic systems.
16. Explain the asymmetric hydroboration reaction using $IPCBH_2$ and IPC_2BH.
17. Discuss the effect of conformation in the course and rate of elimination reactions with any two illustrative examples.
18. What are chiral auxiliaries? Illustrate the use of chiral auxiliary in asymmetric Diels-Alder reaction.

(6 x 2 = 12 Weightage)

Section C

Answer any ***two*** questions. Each question carries 5 weightage.

19. Write a note on diastereoselective aldol reaction involving *cis* and *trans* enolates. Explain the major and minor stereoisomers with the help of Zimmermann-Txaler model.
20. Explain why Hammett equation is considered to be a linear free energy relationship. Discuss the various parameters involved in the equation and explain their significance in the course reactions.
21. (a) Explain 'antiaromaticity' with suitable examples.
    (b) What are importance rules of resonance.
22. (a) Give an account of isomerism of substituted biphenyls.
    (b) Explain briefly the effect of conformation on the course and rate of S_N1 and S_N2 reactions.

(2 x 5 = 10 Weightage)

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