N – 5413

(Pages : 3)

Reg. No. : .....

Name : .....

First Semester M.Sc. Degree Examination, May 2022

Chemistry/Analytical Chemistry/Polymer Chemistry

CH/CL/PC 212 : ORGANIC CHEMISTRY I

(2020 Admission onwards)

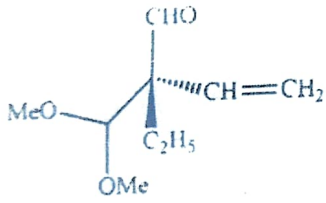
Time : 3 Hours

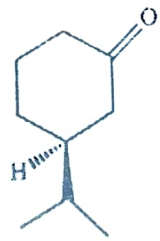
Max. Marks : 75

SECTION – A

Answer two among (a), (b) and c) from each. Each sub question carries 2 marks

1. (a) Assign the configuration (R or S) for

(i) 

(ii) 

(b) Write one example each for chiral, achiral, prochiral and meso form of an organic compound.

(c) Why hydroboration of alkene is stereospecific and regioselective reaction?

2. (a) Sketch the Si / Re faces of acetophenone

(b) Draw the structure of Ibuprofen. Give its uses.

(c) What is Cotton effect? Give its significance.

P.T.O.

3. (a) Arrange the following radicals in the increasing order of their stability

$CH_3\dot{C}H_2, (CH_3)_2\dot{C}H, (CH_3)_3\dot{C}$ and $CH_2 = CH - \dot{C}H_2$.

(b) What is AIBN? Give its structure and applications.

(c) Explain Chichibabin reaction.

4. (a) Give the structure of a classical and non-classical carbonium ion.

(b) Justify the statement with suitable example that "Aryl and vinyl halides show low reactivity towards nucleophilic substitution reaction compared to alkyl halides."

(c) What is Iodolactonisation? Give one example.

5. (a) Explain Saytzeff's rule of elimination reaction.

(b) What is Chugaev reaction?

(c) Illustrate Shapiro reaction with suitable example.

(10 × 2 = 20 Marks)

SECTION – B

Answer *either* (a) or (b) from each question. Each question carries **5** marks.

6. (a) Give a brief account of the chiral auxiliary and chiral reagents.

(b) Explain octant rule and axial haloketone rule using proper examples.

7. (a) Explain the free radical chlorination of alkenes.

(b) Illustrate (i) Mc-Murry reaction (ii) Pinacol coupling reaction.

8. (a) Discuss the mechanism of S_Ni reaction with examples.

(b) Explain cis and trans hydroxylation of cycloalkenes.

9. (a) Write a note on stereo-aspects of substituents on the rate of addition >C=C< system.

(b) Explain the mechanism of Mannich reaction by using one example.

10. (a) Discuss the stereochemistry of >C=C< bond formation in cyclic systems.

(b) Explain Cis elimination of esters using one example.

(5 x 5 = 25 Marks)

SECTION – C

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

11. Discuss the conformational analysis of substituted cyclohexane.

12. Describe the structure, formation and stability of nitrenes. Write any two reactions that involving nitrene as intermediates.

13. (a) Discuss the stereochemistry, effect of solvent, structure of leaving group and substrate structure on S_N1 and S_N2 reactions.

(b) Explain the S_NAr reactions.

14. Write a note on normal aldol condensation and crossed aldol condensation.

15. Discuss E1, E2, E1cB mechanisms for the elimination reactions.

(3 x 10 = 30 Marks)
