

DECEMBER 2015

P/ID 40121/PCHA

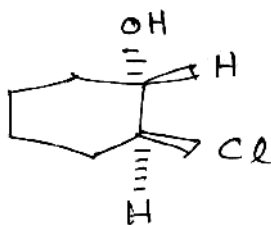
Time : Three hours

Maximum : 100 marks

PART A — (10 × 2 = 20 marks)

Answer ALL questions.

1. Assign R/S configuration for the chiral centres in the following compound :



2. Write a Fischer projection and Newmann formulae of threo-2,3-dichloro-3-phenylpropanoic acid.
3. Define Atropisomerism.
4. Bring out the difference between conformation and configuration.
5. The Gauche conformation of ethylene glycol is preferred as compared to its anticonformation. Why?

6. Sketch the conformation of trans-decalin and list all symmetry elements present.
7. What are non-classical carbocations? Give an example.
8. What are ambident nucleophiles?
9. Both m-bromoanisole and o-bromoanisole yield the same product m-anisidine in nucleophilic substitution reactions. Why?
10. What is Reimer-Tiemann reaction?

PART B — (4 × 20 = 80 marks)

Answer ALL questions.

11. (a) Write short notes on :
 - (i) Asymmetric synthesis
 - (ii) Enantiotopic and diastereotopic hydrogens
 - (iii) Stereo selective reactions
 - (iv) Prochirality.

Or

- (b) (i) Discuss the optical activity of allenes.
- (ii) Write explanatory notes on stereochemistry of biphenyls.

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12. (a) With suitable examples, discuss the effect of angle strain, torsional strain, steric strain and intramolecular hydrogen bonding on the stability of conformations.

Or

- (b) (i) Account for the observation that the potential energy difference between cis-and-trans-9-methyldecalins is less than that of cis-and-trans-decalins.
- (ii) Compare the reactivity of cis-and-trans-4-butylcyclohexanols towards oxidation by chromic acid.
13. (a) Write short notes on :
- (i) Von-Braun reaction
- (ii) Claisen condensation
- (iii) S_Ni reaction
- (iv) Neighbouring group participation

Or

- (b) (i) Discuss the various mechanisms encountered during the hydrolysis of esters under acid/base catalytic conditions.
- (ii) Derive Hammett equation and explain the importance of " ρ " and " σ ".

14. (a) (i) Discuss the mechanism of nitration and give the evidences for the formation of nitronium ion.
- (ii) Outline the methods of synthesis of 1,2,3,-trimethyl-benzene and tribromo benzene.

Or

- (b) Write short notes on :
- (i) Ziegler alkylation
- (ii) Chichibabin reaction
- (iii) Vilsmeier-Hack reaction
- (iv) Gattermann reaction.
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