

ST. JOSEPH'S COLLEGE (AUTONOMOUS), BANGALORE-27
 MID-SEMESTER TEST- AUGUST 2016
 MSc. CHEMISTRY-I SEMESTER
CH-7215- ORGANIC CHEMISTRY

Time: 1.5 hrs

Maximum marks: 35

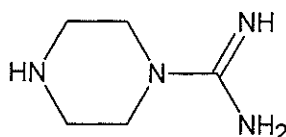
This question paper has *two* printed pages and *three* parts.

PART A

Answer any **THREE** questions.

3 x 2 = 6

1. Which proton in the following compound is more likely to be removed when the compound is treated with a base? Justify your answer.



2. State the principle of microscopic reversibility. Why are photochemical reactions exceptions to this principle?
3. Draw the energy profiles for the following reaction if (i) the reaction product is B under kinetic control and C under thermodynamic control and if (ii) the product is B under both kinetic and thermodynamic controls.
- B \leftarrow A \rightarrow C
4. Write the structure of an optically active allene and give the configuration notation.
5. Write the following structures: a) Fischer projection formula of threo-2-bromo-3-chlorobutane b) (E)-1,3-dichloro-2-butene.

PART B

Answer any **TWO** questions.

2 x 12 = 24

6. a) What are i) nitrenes and ii) carbon free radicals iii) carbocations. Give a method of generating each of them.
 b) What is steric inhibition resonance? With suitable examples give any three properties that can be affected owing to steric inhibition of resonance. (6+6)
7. a) Explain isovalent and sacrificial hyperconjugation with an example each.
 b) Explain Curtin-Hammett principle.
 c) How are racemic modifications classified? Give the melting point diagram for each type.
 d) Draw Newman projection formulae for the most stable conformations of
 i) 1,2-dibromoethane and ii) 2-bromoethanol. (3+3+3+3)

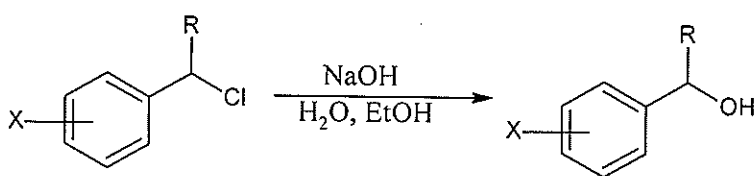
8. a) With suitable examples discuss chirality in i) biphenyl derivatives and ii) cyclophanes.
 b) Draw Fischer projection formulae for all the stereoisomers of 1,2,3,4,5-pentachloropentane. Identify meso compound/s and a pair of enantiomers among them and give the configuration notation of C-3 in the relevant stereoisomers. (6+6)

PART C

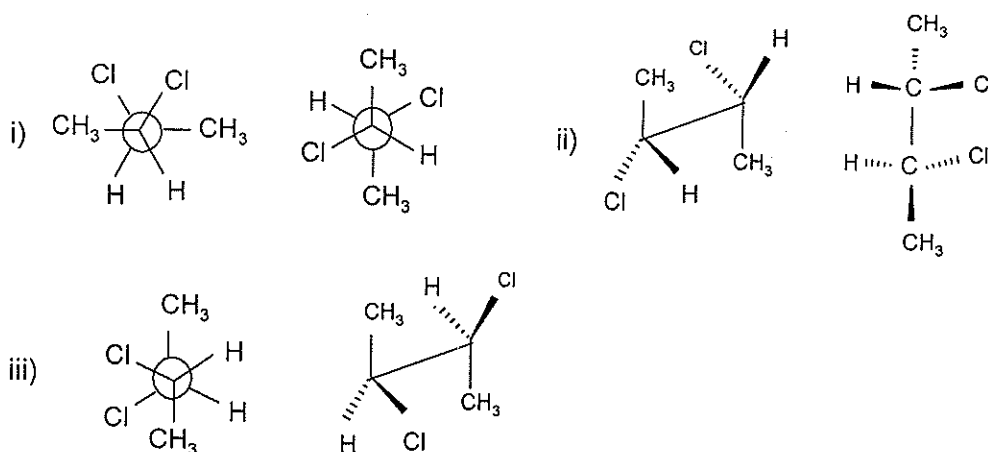
Answer any **ONE** question.

1 x 5 = 5

9. Explain the difference between these Hammett ρ values by mechanisms for the two reactions. When R=H, $\rho = -0.3$ but, when R = Ph, $\rho = -5.1$. In both reactions the substituent 'X' that is varied in the ring is the same.



10. a) Label the following pairs of molecules as Identical/enantiomers/diastereomers.



- b) Identify stereoheterotopic ligands and faces (indicate which type) in the following molecule and give relevant configuration notation to the front face and to any one ligand. (3+2)

