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Reg. No. : .....

Name : .....

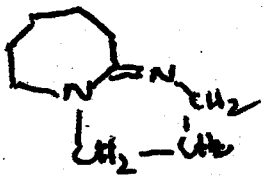
First Semester M.Sc. Degree Examination, February 2016
Branch : Chemistry
CH/CL/CA/CM 212 : ORGANIC CHEMISTRY – I
(2013 Admission Onwards)

Time : 3 Hours Max. Marks : 75

SECTION – A

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

1. a) Write IUPAC names of the following



b) Indicate the elements of symmetry (other than Cn) present in each of the following molecules :

I) S-cis (cisoid conformation of (3E, 5E)– 4, 5 – dimethyl – 3, 5 – octadiene

II) 4-chloropiperidine.

c) Define conformation and configuration.

2. a) In benzanilide the ring attached to nitrogen undergoes electrophilic substitution more readily. Account for this observation.

b) Although amides can be hydrolysed by either aqueous acid or aqueous alkali, hydrolysis of p-nitroacetanilide is best carried out in acidic solution – Explain this observation.

c) How singlet carbene is differentiated from triplet carbene ?

3. a) Arrange with explanation $F^{\ominus}$, $Cl^{\ominus}$, $Br^{\ominus}$ and $I^{\ominus}$ in the increasing order of their nucleophilicity in ethanol.

b) Chloromethoxy ethane undergoes solvolysis at a rate faster (5×10^9 times) than 1-chloro-2-methoxy ethane ($CH_3OCH_2CH_2Cl$). Explain this observation.

c) What is a 1, 3– or r-elimination reaction ? Give an example.

P.T.O.

4. a) What is Woodward hydroxylation ?

   b) Predict the product and discuss the mechanism in the following reaction

   cis-2-Butene $\xrightarrow{CHCl_3/t\text{-}BuO^-K^+}$?

   c) How would you prepare β-hydroxy ester from carbonyl compound ?

5. a) What is R_f value ?

   b) Write the principle of paper chromatography.

   c) Outline the applications of capillary electrophoresis. **(2×10=20 Marks)**

SECTION – B

Answer either (**a**) or (**b**) of **each** question, and **each** question carries **5** marks.

6. a) Give a brief account on stereochemistry of non-carbon chiral centres.

   b) Write a note on octant and axial haloketone rules.

7. a) What is $S_{NR'}$ mechanism in aromatic nucleophilic substitution ?

   b) What is autoxidation and radical chain reaction ? Explain it with suitable examples.

8. a) What is E_1CB mechanism ? How would you differentiate it from E_2 mechanism ?

   b) Write a note on "effect of leaving group and substrate structure in nucleophilic substitution reaction".

9. a) What is Benzoin condensation ? Outline its mechanism. State its applications in organic synthesis.

   b) Outline the mechanism of :

      1) Wittig reaction and

      2) Darzen reaction.

10. a) State Craig's technique of liquid liquid extraction.

    b) Write a note on chiral separations using HPLC. **(5×5=25 Marks)**

SECTION – C

Answer **any three** questions and **each** question carries **10** marks.

11. Give a brief account on effect of conformation on reactivity of cyclohexane and its derivatives.

12. Discuss about the reactivity and orientation of substituents in aromatic electrophilic substitution reactions.

13. Explain the following :
    I) Hofmann and Saytzeff elimination.
    II) Neighbouring group participation in nucleophilic substitution reaction.

14. Give a brief account on mechanism of esterification and ester hydrolysis.

15. Write notes on the following :
    I) Partition chromatography
    II) Column matrices.

(10×3=30 Marks)