RAMAKRISHNA MISSION VIDYAMANDIRA

(Residential Autonomous College under University of Calcutta)

B.A./B.Sc. FIFTH SEMESTER EXAMINATION, DECEMBER 2014

THIRD YEAR

Date : 20/12/2014 **INDUSTRIAL CHEMISTRY (Honours)**

Time : 11 am – 1 pm **Paper :** V (Gr. B) Full Marks : 50

Unit – I

1. Write notes on **any four** : [4×5]
   a) Bhopal gas accident
   b) BOD, COD & TOC
   c) Green house effect
   d) E1A
   e) Hydrosphere / Water cycle
   f) Automobile pollution

Unit – II

(*Answer **any five** questions*) [5×6]

2. a) Draw the potential energy curve for n-butane molecule and discuss about the relative stability of the conformations? [3]
   b) i) Write the most stable conformation for 1,2-di hydroxyl ethanol and explain the reason for stability. [1·5]
   ii) What is torsion angle and how it differs from dihedral angle? [1·5]

3. a) What do you mean by Cs pathway of inversion of cyclohexane chair form? Explain with diagram. [3]
   b) Explain 1,3 diaxial interaction for 1,3 dimethyl cyclohexane and draw the most stable conformation. [3]

4. a) Which conformer of 1,2-dicarboxyl cyclohexane can form acid anhydride easily? Explain. [2]
   b) Trans-4-t-butylcyclohexanol undergoes chromic acid oxidation quickly than its cis-isomer —explain [2]
   c) When 4-tertiarybutyl cyclohexanone is treated with $LiAlH_4$, explain the formation of major product. [2]

5. Discuss briefly about Bardhan-Sengupta synthesis of phenanthrene and give mechanism and reagent used in each step. [6]

6. Explain the mechanistic view of electrophilic aromatic nitration during the nitration reaction of naphthalene. Also explain the formation of major isomer in this reaction. [6]

7. a) Discuss about Hoffmann's method of separation of amines. [2]
   b) Compare the basicity of $CH_3CH_2NH_2$, $(CH_3CH_2)_2NH$ and $(CH_3CH_2)_3N$ in aqueous as well as non-aqueous medium with proper explanation. [4]

8. Do the conversion (**any three**) : [3×2]
   a) Nitrobenzene to *m*-nitro aniline
   b) 1,4-naphthaquinone to anthracene
   c) Aniline to di-phenyl hydrazine
   d) Nitrobenzene to *p*-amino phenol
   e) N-methylphthalimide to methyl amine

———— × ————