Printed Pages: 2

CY-301

Roll No. | | | | | | | | | |

B. Tech.

(SEM- III) ODD SEMESTER THEORY EXAMINATION, 2015-16

APPLIED ENGINEERING CHEMISTRY

Time: 3 Hours ***Maximum Marks: 100***

Note: Attempt all questions.

1. *Attempt any **FOUR** parts of the following:* **(4x5=20)**

a) Convert alcohol into mesylates and tosylates.

b) Discuss Reduction of nitrobenzene under different conditions.

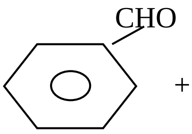
c) (i) Explain the mechanism of diazotization.

(ii) What happens when benzene diazonium chloride reacts with (i) Phenol (ii) Cinnamic acid (iii) HBF_4.

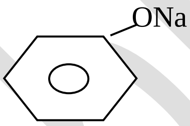
d) Complete and name the following reactions:

(i) $CH_3COOH \xrightarrow{\text{Pand Bromine}}$

(ii) $RCOOH \xrightarrow[\text{2. } NaN_3]{\text{1. Thionylchloride}}$

(iii)  + $(CH_3CO)_2O \xrightarrow[180^0C]{CH_3COONa}$

(iv) $C_6H_5CHO + CH_2(COO\ C_2H_5)_2 \xrightarrow[\text{Base}]{\text{Piperidine}}$

(v)  + $CO_2 \xrightarrow[\text{5-7 atm.}]{150^0C}$

e) Write note on:

(i) Crown ethers

(ii) Epoxides

f) Write mechanism of Lossen Rearrangement .

2. *Attempt any **FOUR** parts of the following:* **(4x5=20)**

a) What do you mean by aromaticity? What are the conditions for a compound to be aromatic? Explain aromaticity in non- benzenoid compounds.

b) Give the mechanism of the reaction of $LiAlH_4$ to carbonyl compounds. Complete the following reactions:

i) $C_6H_5NHCOCH_3 \xrightarrow{\text{LAH}}$?

ii) $RCN \xrightarrow{\text{LAH}}$ **?**

iii) $C_6H_5CH{=}CHCHO \xrightarrow{\text{LAH}}$?

c) What are Chiral drugs? Give example. Discuss the structure and activity of Ibuprofen.

d) Complete the following reactions:
   i) $CH_3MgBr + CO_2$ ----------→**?**
   ii) $CH_3MgBr + CH_3CN$ ----------→**?**
   iii) CH_3MgBr + ethylene oxide (C_2H_4O) ----------→**?**
   iv) CH_3MgBr + ester ----------→**?**
   v) $CH_3MgBr + CS_2$ ----------→**?**

e) What are stereo specific reactions. Explain with example.

f) Write different conformers of 1, 2,-di-substituted cyclohexane and arrange them in decreasing order of stability.

3. *Attempt any **TWO** parts of the following:* **(2x10=20)**

a) **i)** What is Colligative property? 0.36g of a substance dissolved in 25.5g of Benzene lowered the freezing point of Benzene by $0.42^{0.}$ Calculate the molar mass of solute (molal depression constant of Benzene is 5.15^0)

ii) A solution containing 2.44g of a solute dissolved in 75g of water boiled at 100.413^0C. Calculate the molar mass of the solute (Kb for water = 0.52^0)

b) **i -** Define Surface Tension, Interfacial Tension and discuss one method of determination of Surface Tension. Also explain the influence of temperature on Surface Tension.
ii. What are protective colloids? Distinguish between Lyophilic and lyophobic colloid.

c) i- Define the terms: catalyst. auto catalysis, negative catalysis, promoters, poisons homogeneous and heterogeneous catalysis.

ii) Differentiate between adsorption isotherm and adsorption isobar.

4. *Attempt any **TWO** parts of the following:* **(2x10=20)**

a) Write a brief introduction and application of Mass Spectroscopy.

b) Discuss principle of High Performance Liquid Chromatography.What are the applications of HPLC in Industry? Highlight advantages and limitations of this method.

c) Explain the principle and industrial applications of Gas Liquid Chromography or Atomic absorption Spectrophotometry.

5. *Attempt any **FOUR** parts of the following:* **(4x5=20)**

a) (i) Discuss the reaction mechanism of D- Glucose with phenyl hydrazine.
(ii) What is the product of reaction of Glucose with i) Bromine water, ii) HNO_3, iii) HIO_4.

b) (i) Discuss the mechanism of Osazone formation.
(ii) Discuss cyclic structure of Glucose.

c) What are nucleic acids? State difference between RNA and DNA. What is monomer of nucleic acid?

d) What are proteins ? How do you relate it with α amino acid? Write three properties of Zwitter ion.

e) What are Carbohydrates? How will you classified Carbohydrates? Write hydrolysis products of Sucrose and Lactose.

f) Write note on (i) Ruff degradation (ii) Lobry devan Ekestein rearrangement

---