

Printed Pages : 4



AS-103

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 199103

Roll No.

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B. Tech.

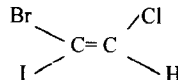
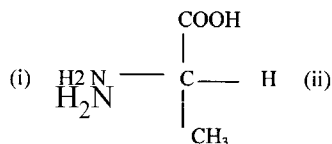
(SEM. I) (ODD SEM.) THEORY
EXAMINATION, 2014-15
ENGG. CHEMISTRY

Time : 3 Hours]

[Total Marks : 80

SECTION - A1. Attempt any EIGHT Parts. **2x8=16**

- Calculate the density of NaCl which crystallizes in a fcc lattice with unit cell length of 0.4nm.
- What is Ziegler Natta catalyst?
- Write the two example of molecule which has optical activity without chiral carbon.
- Assign R or S and E or Z configuration to the following compound:



- Define isotactic and syndiotactic polymer.
- Name the substrate and product name of Diels Alder reaction.

- (g) Why Cu gets deposited on iron nail immersed in copper sulphate solution?
- (h) What is the Principle of EDTA titration?
- (i) What is addition and condensation polymerization?
- (j) How many NMR signals obtained in $\text{CH}_3\text{CH}_2\text{CH}_2\text{CHO}$ & $(\text{CH}_3)_2\text{CH}\cdot\text{CHO}$

SECTION - B

2 Attempt any THREE questions. **8x3=24**

- (a) (i) Describe the different conformation of n-Butane with energy diagram.
- (ii) What do you understand Concentration cell, give the cell equation?
- (b) (i) What is meant by space lattice? Calculate the total no. of atom in Simple cubic, FCC & BCC.
- (ii) Calculate the density of compound if 200g of this compound contain 24×10^{23} atoms, edge length is 200pm. The compound having FCC geometry.
- (c) (i) What are elastomers? Explain the process of vulcanization.
- (ii) Give the preparation and use of BUNNA-S and butyl rubber. Distinguish between homopolymer and copolymer.
- (d) (i) In $(\text{CH}_3)_3\text{-Br}$ and $\text{CH}_3\text{-Br}$ which molecule undergo SN^1 and SN^2 process and which molecule gives inverted and which give mixture of products.
- (ii) What are enantiomers and diastereomers? Explain the optical isomerism of tartaric acid.

SECTION - C

Note. Attempt all FIVE questions. Each question carries equal marks.

3. Attempt any One of the following: **8x5=40**

- (a) Explain the mechanism of hydrogen evolution and oxygen absorption in electrochemical corrosion.
- (b) What are organometallic compounds? Explain their synthetic method and applications.

4. Attempt any One of the following:

- (a) Write a short on softening of water by Zeolite process.
- (b) Calculate the total badness of water containing 16.8 mg/L of $\text{Mg}(\text{HCO}_3)_2$, 19.0 mg/L of MgCl_2 , 24.0 mg/L of MgSO_4 and 22.0 mg/L CaCl_2

5. Attempt any One of the following:

- (a) What is biogas? Explain biogasification process with help of biogas plant.
- (b) Give the relation between NCV& GCV. The following data obtained in Bomb calorimeter:

Weight of crucible	= 3.469gm
Weight of crucible+fuel	= 4.678gm
Water equivalent of calorimeter	= 570gm
Water taken in calorimeter	= 2200gm
Rise in temperature	= 2.3°C
Colling correction	= 0.047°C
Acid calorimeter	= 62.6°C
Fuse wire calorimeter	= 3.8 °C
Cotton thread calorimeter	= 1.6 calories

Calculate the GCV of fuel sample. If the fuel contains 6.5% H, determine the value of NCV.

6. Attempt any One of the following:

(a) Write the mechanism and application of following reactions.

(i) Beckmann Rearrangement reaction

(ii) Cannizarro Reaction mechanism with suitable example

(b) Explain the following polymers with their application

(i) BAKELITE

(ii) PMMA

(iii) Nylon-66

(iv) PAN

(v) Polythene

7. Attempt any One of the following:

(a) (i) Write the short note on Galvanic cell.

(ii) Calculate the Emf of cell



$$E^0 (\text{Zn}|\text{Zn}^{+2}) = -0.763\text{v and } (\text{Fe}|\text{Fe}^{+2}) = -0.44\text{V}$$

(b) Describe the various types of liquid crystals. Distinguish between nematic and smectic liquid crystals.
