

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

PAPER ID : 9928

Roll No.

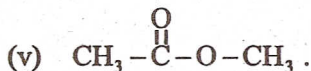
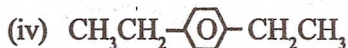
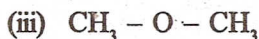
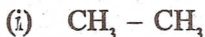
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B. Tech.**(SEM. II) THEORY EXAMINATION 2010-11****CHEMISTRY***Time : 3 Hours**Total Marks : 100***Note : Attempt all questions.**

1. Attempt any two parts of the following : (10×2=20)

(a) Explain metallic bond on the basis of molecular orbital theory.

(b) How many NMR signals are observed in the spectrum of:



(c) Give the mechanism of the following reactions :

(i) Cannizaro Reaction

(ii) Reimer-Tiemann Reaction.

2. Attempt any **four** parts of the following : (5×4=20)
- (a) Discuss the mechanism of electrochemical corrosion.
 - (b) What is meant by calorific value of fuel ? What is the difference between GCV and NCV ?
 - (c) How is ozone formed and depleted in nature ?
 - (d) Explain n-type and p-type semi conductors.
 - (e) Calculate the pH of 0.1N acetic acid. The K_a for acetic acid is 1.86×10^{-5} .
 - (f) Distinguish between catalytic promoters and poisons.

3. Attempt any **two** parts of the following : (10×2=20)

- (a) What is permanent hardness ? Write the constituents responsible for permanent hardness.

A water sample contains 408 mg of CaSO_4 per litre. Calculate the hardness in terms of CaSO_4 equivalents.

- (b) Distinguish between natural and artificial fuel. Calculate the GCV and NCV of coal having following compositions; C = 85%, H = 8%, S = 1%, N = 2%, ash = 4% Latent heat = 587 Cal/g.
- (c) What is meant by polymerization ? Differentiate between addition and condensation polymerization.

4. Attempt any **four** parts of the following : (5×4=20)

- (a) Differentiate between thermoplastic and thermosetting polymers.

- (b) Differentiate between order and Molecularity of reaction.
- (c) Explain the methods of prevention of corrosion.
- (d) A solution of thickness 3 cm transmits 30% incident light. Calculate the concentration of the solution, given extinction coefficient $\epsilon = 4,000 \text{ dm}^3\text{mol}^{-1}\text{cm}^{-1}$.
- (e) What do you mean by acid rain? Explain the consequences of acid rain.
- (f) Draw the molecular orbital energy diagram of N_2 .

5. Attempt any two of the following : (10×2=20)

- (a) What do you mean by Energy Activation? Explain with the help of energy reaction coordinate diagram. Also explain how the nature of activated complex changes in the presence of a catalyst.
- (b) Define pollution. List various sources of pollution and discuss their effect on the environment.
- (c) Explain clearly the terms; component, phase and degree of freedom. State the phase rule and discuss its application to the system of water vapour, liquid water and ice.