CBCS SCHEME

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18CH36

Third Semester B.E. Degree Examination, June/July 2023
Technical Chemistry

Time: 3 hrs. Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1 a. Define Chemical bond. Give the different types of chemical bond with suitable example. **(07 Marks)**

b. Outline the salient features of molecular orbital theory. How this theory accounts for the non existence of He_2 molecule. **(07 Marks)**

c. What is resonance? Explain the stability of carbonation based on resonance theory. **(06 Marks)**

OR

2 a. What is hydrogen bond? Explain the hydrogen bond formation in HF and H_2O molecule. **(07 Marks)**

b. Give the comparison of valence bond theory with molecular orbital theory. **(07 Marks)**

c. Discuss the bond theory of metals. **(06 Marks)**

Module-2

3 a. What are colligative properties? State Raoult's law and give its limitations. **(07 Marks)**

b. What is meant by elevation in boiling point? Pure water boils at 100°C. A solution prepared by dissolving 1.2g of solute in 9g of water boils at 100.7°C. Calculate the molecular mass of the solute. Given K_6 for water is 0.52 °C/1000g. **(07 Marks)**

c. Discuss Berkeley and Hartley's method of measuring osmotic pressure of a dilute solution. **(06 Marks)**

OR

4 a. Derive an expression to determine molecular mass of non volatile solute from lowering of vapour pressure. **(07 Marks)**

b. Describe an experimental determination of molecular weight by ebullioscopy method. **(07 Marks)**

c. Write a note on: i) Isotonic solution ii) Abnormal molecular weight. **(06 Marks)**

Module-3

5 a. What is Isomerism? Explain the types of isomerism with examples. **(06 Marks)**

b. Explain the various factors affecting the stability of complex ions. **(06 Marks)**

c. Discuss Physical and Chemical properties of geometrical isomers. **(08 Marks)**

OR

6 a. What are Conformational Isomers? Explain the conformational isomerism in propane. **(07 Marks)**

b. What are Coordination Compounds? Explain the Werner's theory of coordination compounds. **(08 Marks)**

c. What is Effective Atomic number? Find the effective atomic number of the metal ions in the following complex ions i) $[C_O(NH_3)_6]^{3+}$ ii) $[Zn(NH_3)_4]^{2+}$. **(05 Marks)**

Module-4

7 a. What are Heterocyclic Compounds? Discuss the Nomenclature of Heterocyclic Compounds. **(07 Marks)**

b. Discuss the structure , preparation , properties and reactions of Furans. **(08 Marks)**

c. Give the detailed classification of Heterocyclic Compounds and mention two examples for each class. **(05 Marks)**

OR

8 a. Explain the synthesis, properties and reactions of Pyrole. **(07 Marks)**

b. Discuss the preparation , properties and reactions of Azetidines. **(07 Marks)**

c. What are Diazenes? Discuss synthesis and properties of Pyrimidine. **(06 Marks)**

Module-5

9 a. Discuss the mechanism of SN^2 reaction, with suitable examples. **(08 Marks)**

b. Discuss the mechanism of Friedel Craft Alkylation. **(06 Marks)**

c. Discuss the Electrophic substitution in Sulphonation. **(06 Marks)**

OR

10 a. Discuss the effect of substituents for further substitution by taking relevant examples. **(08 Marks)**

b. Discuss the Mechanism of Elimination reaction (E_1 and E_2). **(06 Marks)**

c. Explain the formation of Carbocating, with suitable examples. **(06 Marks)**

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