BAC-C102
SEMESTER EXAMINATION DECEMBER 2023
CLASS: B. Tech SEMESTER: I
ENGINEERING CHEMISTRY

Time: 3 hours Max. Marks: 70

Note: Question Paper is divided into two sections: **A and B**. Attempt both the sections as per given instructions.

SECTION-A (SHORT ANSWER TYPE QUESTIONS)

Instructions: Answer any ***five*** questions in about 150 words each. Each question carries six marks.
(5 X 6 = 30 Marks)

Question-1: What is atomic radius? Why does atomic radius decrease across a period? Why are anions bigger than their parent atoms?

Question-2: What is hydrogen bond? Explain the different types of hydrogen bonds with examples.

Question-3: Define the rate of reaction. How does the rate of a reaction depend upon the concentration and surface area of the reactants?

Question-4: Define any two of the following with an example for each: (a) Enthalpy of a system (b) Standard electrode potential (c) Arrhenius concept of acids and bases

Question-5: What are monomers and polymers? Explain with suitable examples.

Question-6: What is vulcanization of rubber? What are the advantages of vulcanized rubber?

Question-7: What are nanomaterials? Explain the top down and bottom up approach of synthesis of nanomaterials.

Question-8: What are Fullerenes? Discuss the properties and applications of Fullerenes in brief.

Question-9: Give the synthesis and uses of Paracetamol.

Question-10: What is optical isomerism? How many optical isomers are possible in tartaric acid?

SECTION-B (LONG ANSWER TYPE QUESTIONS)

Instructions: Answer any ***four*** questions in detail. Each question carries 10 marks.
(4 X 10 = 40 Marks)

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Question-1: Define the term electronegativity. How does it vary in the periodic table? Discuss the factors which influence the electronegativity of an atom.

Question-2: Define hybridization. Explain the structure of BF_3 and NH_3 molecules on the basis of hybridization.

Question-3: What is activation energy? How is activation energy of a chemical reaction determined?

Question-4: Write the Nernst equation. Discuss any two applications of the Nernst equation in detail.

Question-5: Discuss the preparation and uses of (a) Teflon (b) Nylon 6,6

Question-6: Write short notes on (i) Addition and condensation polymers (ii) Natural and synthetic rubbers

Question-7: What is nanotechnology? Discuss the applications of nanotechnology in various fields.

Question-8: What are substitution reactions? Describe S_N1 and S_N2 substitution reactions with examples.

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