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Mid-Term Theory Examination, 2021-22

Engineering Chemistry (BCHS 0101)

Course: B.Tech. **Year/ Semester: I/I**

Time: 2 Hours **Maximum Marks: 30**

Section A

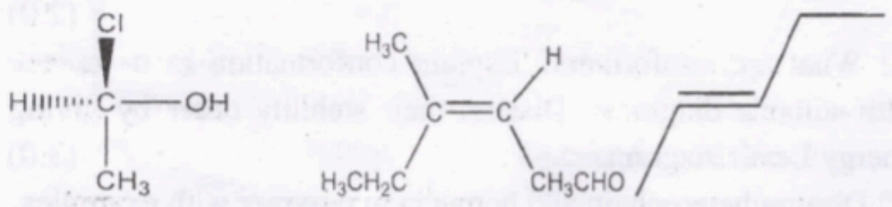
Note: Attempt all questions **2 × 3 = 6 marks**

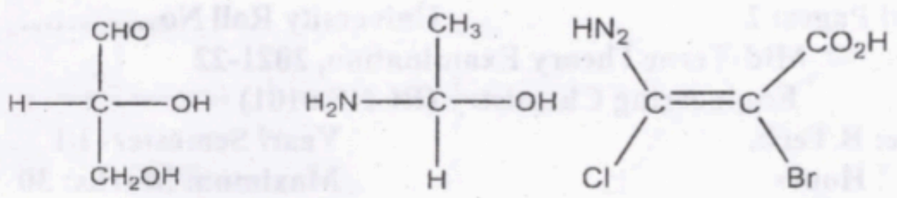
1. What is optical activity? Give the stereoisomers of Tartaric acid.
2. Suggest the role of flux used in ceramic industry. Discuss important industrial applications of ceramics.
3. What is metallic Bond? Explain conductor, semiconductor and insulator on the basis of molecular orbital theory.

Section B

Note: Attempt all questions **3 × 3 = 9 marks**

1. Define is lubricant? Discuss the SEN and Flash & Fire point of lubricants.
2. (a) Design preparation process and industrial application of any one polymer. (2.0)
   I. Nylon6,6
   II. Vulcanized rubber
   (b) Find weight average molecular weight for polypropene, given its degree of polymerization as 10,000. (1.0)
3. Assign R/S and E/Z to the following.





Section C

Note: Attempt any three questions **5 × 3 = 15 marks**

1. (a) Differentiate Gross and Net Calorific value of a fuel. (1.5)
   (b) Discuss the importance of proximate analysis of Coal. (1.5)
   (c) A Coal has the following composition by weight C=90%, O=3%, S=0.5, N=0.5 and ash=2.5%.Net Calorific value of the coal was found to be 8490.5kcal/kg. Calculate the percentage of Hydrogen and Higher calorific value of a coal. (2.0)
2. Using the concept of Molecular orbital theory, draw the molecular orbital diagram of N_2 molecule, find out bond order and also assign magnetic behavior.
3. (i) List composition and uses of any two of the glasses. (3.0)
   (a) Flint
   (b) Pyrex
   (c) Potash glass
   (ii) A gaseous fuel has the following composition by volume: H_2=34%, CH_4=16%, N_2=38% and O_2=12%. If 22% excess air is used, find the weight of air actually supplied per m^3 of this gas. (2.0)
4. (i) What are conformers? Explain conformation in n- butane with suitable diagrams. Discuss their stability order by giving Energy Level diagram. (3.0)
   (ii) Discuss heterochain and homochain polymer with examples. (2.0)