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B.Tech First Year (Even Semester Examination)
Mid - I Examination 2015-16
AHC 1001: Engineering Chemistry

Time 1 Hrs. 30 Minutes **Max. Marks: 20**

SECTION -A

NOTE : - Attempt all questions **(1 × 5 = 5 Marks)**

Q.1 In which order of reaction the time for half change is directly proportional to the initial concentration of the reactant. Also write the unit of rate constant of this order of reaction.

Q.2 Arrange O_2, N_2 and He_2 in order of their increasing bond order.

Q.3 Why ethyl alcohol is soluble in water and dimethyl ether is insoluble in water?

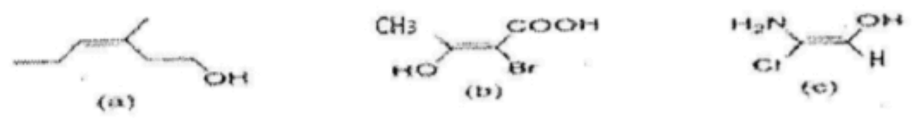
Q.4 Write stability order of aliphatic carbanions.

Q.5 What do you mean by smart material ?

SECTION –B

NOTE :- Attempt any three questions. **(2 × 3 = 6 Marks)**

Q.1 Assign (E)- or (Z)- configuration to any of the following two compounds with proper numbering:-



Q.2 What is hydrogen bond? Explain inter molecular hydrogen bond with suitable examples.

Q.3 Explain band theory of metallic bond.

Q.4 Derive rate equation for the reaction
$CH_3COOC_2H_5 + NaOH \longrightarrow CH_3COONa + C_2H_5OH$

(P.T.O.)

SECTION –C

NOTE :- Attempt any three questions. **(3 × 3 = 9 Marks)**

Q.1 What are conformers? Explain conformation in n-butane with suitable diagrams. Discuss their stability order also by giving Energy Level diagram.

Q.2 With the help of Molecular Orbital Theory, draw the Molecular Orbital diagrams of homonuclear molecule having bond order 2 and Heteronuclear molecule having bond order 3.

Q.3 In the course of reaction

CH_3COOCH_3 (g) ⟶ C_2H_4 (g)+ H_2 (g) + CO_2 (g)

The initial pressure was found to be 0.56 atm. and after 5.4 min. it was 0.84 atm. If the reaction follows first order kinetics, find the rate constant.

Q.4 Write short note on photovoltaic cell.

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