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Total Number of Pages : 02

B.Tech
BS1103

2nd Semester Back Examination 2018-19

CHEMISTRY - I

BRANCH : CHEM, CIVIL, CSE, ECE,
EEE, EIE, ELECTRICAL, IT, MANUTECH, MECH

Time : 3 Hours

Max Marks : 70

Q.CODE : F070

Answer Question No.1 which is compulsory and any FIVE from the rest.
The figures in the right hand margin indicate marks.

- Q1** Answer the following questions : (2 x 10)
- a) What do you mean by component? What is the maximum no of phases that can be in equilibrium at one point for one component system(T&P Constant)?
 - b) Write down the Gibbs's Helmholtz equation and define term involved there in
 - c) Write down electrode reaction of quinhydrone electrode
 - d) Enthalpy/mole is extensive or intensive property. Justify your answer.
 - e) What do you mean by the planes of symmetry and Center of symmetry?
 - f) Construct a galvanic cell for the reaction
$$\text{Zn}_{(s)} + \text{HCl}_{(aq)} \leftrightarrow \text{ZnCl}_{2(aq)} + \text{H}_{2(g)}$$
 - g) Calculate Free energy change when 5 mole of oxygen at 300K and 5bar pressure expand isothermally to 1 bar pressure.
 - h) What do you mean by the Zero –order reaction? Give an example.
 - i) What do you mean by enzyme catalyst? Give an example of enzyme catalytic reaction.
 - j) What do you mean by Eutectic temperature and Critical temperature?
- Q2**
- a) Two second order reaction have identical pre exponential factor and activation energy differ by 20.01 kj/mol .Calculate ratio of their rate constant at (a) 0 °C and (b) 1000 °C (5)
 - b) What do you mean by Order and molecularity?Derive an expression for second order reaction when two reactant are Different? (5)
- Q3**
- a) Prove that $C_p - C_v = [P + \{\partial U / \partial V\}_T] [\partial V / \partial T]_p$ (5)
 - b) What do you mean by close packing in solids ?Give a comparative account of Hexagonal close packing(HCP) and Cubic close packing(BCC) in solids (5)
- Q4**
- a) What is a fuel cell? Write the construction and cell reaction of Hydrogen-oxygen fuel cell (5)
 - b) What do you mean by the catalytic poisoning? (5)
Discuss the various type of catalytic poisoning. with example
- Q5**
- a) Derive an expression for 2nd order reaction when two reactants are same. and different. (5)
 - b) Justify the paramagnetic behavior of O₂ and O₂⁻ With help of Molecular orbital Diagram. With help of Molecular orbital Diagram : (5)

- Q6** With the help of the Phase rule, draw and describe the phase diagram of. Sulphur system and Bi-Cd System (10)
- Q7** How can you find the PH Of solution with help of the Quinhydrone Electrode . Discuss it merit and demerits? (10)
- Q8** Write short answer on any TWO : (5 x 2)
- a) Collision theory of reaction Rate
 - b) Standard Hydrogen electrode.
 - c) Theory of Heterogeneous catalyst