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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)

- 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?
- Write down the Gibbs's Helmholtz equation and define term involved there in
- Write down electrode reaction of quinhydrone electrode
- Enthalpy/mole is extensive or intensive property. Justify your answer.
- What do you mean by the planes of symmetry and Center of symmetry?
- Construct a galvanic cell for the reaction
$$\text{Zn}_{(s)} + 2\text{HCl}_{(aq)} \rightleftharpoons \text{ZnCl}_{2(aq)} + \text{H}_{2(g)}$$
- Calculate Free energy change when 5 mole of oxygen at 300K and 5bar pressure expand isothermally to 1 bar pressure.
- What do you mean by the Zero –order reaction? Give an example.
- What do you mean by enzyme catalyst? Give an example of enzyme catalytic reaction.
- 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?
Discuss the various type of catalytic poisoning. with example (5)

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