

B.Tech 1st Year 2nd Semester
First Unit Test, March-2018
CHEMISTRY 1 [CH 201]

Set-1

(Students are requested to write down the SET No. in their Answer sheet)

Time allotted: 30 minutes

Full marks: 15

Answer any **three** of the following **five** questions

1. (a) Define 1st law of Thermodynamics and write it's mathematical expression
(b) What is Internal Energy of a system? State its properties 2+3 = 5

2. (a) What is pseudo-unimolecular reaction? Show that specific rate constant of a pseudo-unimolecular reaction follows a first order kinetics.
(b) Explain any one type of metal excess defect with diagram. 1+2+2 = 5

3. (a) Write down the Arrhenius equation for the temperature dependence of specific rate constant and explain the terms used
(b) The time required for 10% completion of first order reaction at 298 K is equal to that required for its 25% completion at 308K. If the pre-exponential factor for the reaction is $3.56 \times 10^9 \text{ s}^{-1}$, calculate the energy of activation in kcal
(c) Define the order of a reaction 2+2+1 = 5

4. (a) Write the effect of temperature on the metallic conductor and electrolytic conductor.
(b) Draw the graph of conductometric titration of a precipitation reaction (KCl versus AgNO₃) and explain the nature of the curve with proper reasons 2+3 = 5

5. (a) Define Equivalent Conductance of an Electrolyte and write its units. What is the effect of Dilution on Equivalent Conductance?
(b) Resistance of a 0.5N Electrolyte is found 100 ohms when the electrodes are of 3.0cm x 3.0cm cross-sectional area and separated by 2.0cm
Find out (i) Cell constant and (ii) Specific conductance of the solution 2+3 = 5

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Set-2

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Time allotted: 30 minutes

Full marks: 15

Answer any **three** of the following **five** questions

1. (a) Define Extensive and Intensive properties with example
(b) What is a thermodynamic system? Define different types of system 2+3 = 5

2. (a) Define homogeneous catalyst with example
(b) Draw relevant diagrams showing the variation of energy with respect to reaction coordinate for exothermic and endothermic reactions
(c) What do you mean by activated complex? 2+2+1 = 5

3. (a) Derive an expression for the rate constant of a second order reaction when both the reactants have same initial concentration and prove that half life is inversely proportional to the initial concentration of the reactant.
(b) Explain any one type of metal deficiency defect with diagram 3+2 = 5

4. (a) Define Transport Number and Hydration of ions. Write the effect of hydration of ions on the Conductance of electrolytic solution.
(b) Resistance of a 0.3N KCl solution is found 80 ohms when the electrodes of dimensions 2.0cm x 2.0cm are separated by 2.5cm. Calculate the Equivalent Conductance of KCl solution 2+3 = 5

5. (a) Draw the Conductometric Titration Curve of Strong Acid versus Strong Base and explain the nature of the curve with suitable reasons
(b) What are the differences between Metallic and Electrolytic Conductors? 3+2 = 5