**G.M.S.S.S.S [lakhanmazra]**

**Max Time : 3 hr** **Class : 12th Chemistry Max Marks : 70**

**Mid Term Exam**

**Section – A**

1. Multiple choice Questions: [ 1 x 20 = 20 ]
2. A plant shrink when it is kept in a

|  |  |  |  |
| --- | --- | --- | --- |
| a) hypotonic solution | b) hypertonic solution | c) Isotonic solution | d) pure water |

1. Calculate the mole percentage of CH3OH and H2O respectively in 60 % aqueous solution of CH3OH.

|  |  |  |  |
| --- | --- | --- | --- |
| a) 45.8 , 54.2 | b) 54.2 , 45.8 | c) 50 , 50 | d) 60 , 40 |

1. The law which indicates the relationship between solubility of a gas in liquid and pressure is \_\_\_\_\_\_\_\_\_ .

|  |  |  |  |
| --- | --- | --- | --- |
| a) Lowering of V.P | b) Raoult’s law | c) Van’t Hoff law | d) Henry’s law |

1. The value of van’t Hoff factor for ethanoic acid in benzene is :

|  |  |  |  |
| --- | --- | --- | --- |
| a) 1 | b) 1.5 | c) 0.5 | d) 2 |

1. Which one of following is always true about the spontaneous cell reaction in a galvanic cell?

|  |  |
| --- | --- |
| a) > 0 , Go < 0 , Q > Kc | b) < 0 , Go < 0 , Q < Kc |
| c) > 0 , Go > 0 , Q > Kc | d) > 0 , Go < 0 , Q < Kc |

1. The SI unit of conductivity is :

|  |  |  |  |
| --- | --- | --- | --- |
| a) S/m | b) S/cm | c) Sm | d) Scm |

1. The magnetic moment of [Ni(CN)4] 2 – is:

|  |  |  |  |
| --- | --- | --- | --- |
| a) 1.82 B.M. | b) 2.82 B.M. | c) 4.42 B.M. | d) 5.46 B.M. |

1. Which of the following is affected by catalyst?

|  |  |  |  |
| --- | --- | --- | --- |
| a) H | b) G | c) Ea | d) S |

1. For the reaction : N2 + 3 H2 → 2 NH3, if = 2 x 10 – 4 mol L – 1 s – 1 , the value of would be

|  |  |  |  |
| --- | --- | --- | --- |
| a) 3 x 10 – 4 mol L – 1 s – 1 | b) 4 x 10 – 4 mol L – 1 s – 1 | c) 6 x 10 – 4 mol L – 1 s – 1 | d) 1 x 10 – 4 mol L – 1 s – 1 |

1. Which of these does not influence the rate of reaction?

|  |  |
| --- | --- |
| a) Nature of the reactants | b) Concentration of the reactants |
| c) Temperature of the reaction | d) Molecularity of the reaction |

1. The existence of two different coloured complexes with the composition [Co (CH3)4 Cl2] + is due to :

|  |  |  |  |
| --- | --- | --- | --- |
| a) Ionization isomerism | b) Linkage isomerism | c) Geometrical isomerism | d) Coordination isomerism |

1. Which has the least freezing point?

|  |  |  |  |
| --- | --- | --- | --- |
| a) 1 % sucrose | b) 1 % NaCl | c) 1 % CaCl2 | d) 1 % Glucose |

1. In the lead-acid battery during charging , the cathode reaction is :

|  |  |
| --- | --- |
| a) Formation of PbO2 | b) Formation of PbSO4 |
| c) Reduction of Pb 2+ to Pb | d) Decomposition of Pb at the anode |

1. On addition of small amount of KMnO4 to concentrated H2SO4, a green oily compound is obtained which is highly explosive in nature. Identify the compound from the following :

|  |  |  |  |
| --- | --- | --- | --- |
| a) Mn2O7 | b) MnO2 | c) MnSO4 | d) Mn2O3 |

1. KMnO4 acts as an oxidizing agent in acidic medium. The number of moles of KMnO4 that will be needed to react with one mole of sulphide ions in acidic solution is :

|  |  |  |  |
| --- | --- | --- | --- |
| a) 2/5 | b) 3/5 | c) 4/5 | d) 1/5 |

**Assertion-Reason Based MCQs**

**DIRECTIONS :** In each of the following questions, a statement of Assertion (A) is followed by a statement of Reason (R) is given . Choose the correct answer out of the following choices :

1. Both assertion and reason are true, and reason is correct explanation of the assertion.
2. Both assertion and reason are true, but reason is not the correct explanation of the assertion.
3. Assertion is true, but reason is false.
4. Assertion is false, but reason is true
5. **Assertion:** People taking a lot of salty food experience the puffiness or swelling, called edema

**Reason:** There is water retention in tissue cells and intercellular spaces because of osmosis.

1. **Assertion:** Conductivity of all electrolytes decreases on dilution.

**Reason:** On dilution number of ions per unit volume decreases

1. **Assertion:** The boiling point of pure solvent is always higher than the boiling point of solution.

**Reason:** The vapour pressure of the solvent decreases in the presence of non-volatile solute.

1. **Assertion:** Mercury cell does not give steady potential.

**Reason:** In the cell reaction, ions are not involved in solution.

1. **Assertion:** If more volatile liquid is added to another liquid, vapour pressure of solution will be greater than that of pure solvent.

**Reason:** Vapour pressure of solution is entirely due to solvent molecules

**Section – B [ 2 X 7 = 14 ]**

1. Define Kohlrausch law.
2. The Molarity of 900 g of water is :
3. Write application of Henry’s law.
4. Define solution.
5. Define Mole fraction and Mass percentage.
6. If 20 cc of 1 M CaCl2 and 60 cc of 0.2 M CaCl2 are mixed, what will be the molarity of the final solution?
7. Define ligands.

Or

Define Ebullioscopic constant.

**Section – C [ 3 X 7 = 21 ]**

1. Define Molar and Equivalent conductivity.
2. Calculate the equilibrium constant for the reaction at 298 K

4 Br –  + O2 + 4 H+ 2 Br2 + 2 H2O Given that : = 0.16 V

1. Differentiate between double salts and coordination compounds.
2. Explain Werner’s theory with example.

Or

The molar conductivity of acetic acid at infinite dilution is 387 S cm2 mol – 1. At the same temperature, but at a concentration of 1 mole in 1000 litres, it is 55 S cm2 mol – 1. What is the % age dissociation of 0.001 M acetic acid

1. For the equilibrium, 2 H2 (g) + O2 (g) ⇌ 2 H2O (l) at 25˚C, Go is – 474.78 KJ/mol. Calculate log K for it.
2. Find the two-third life () of a first order reaction in which k = 5.48 x 10 – 14 s – 1.
3. Calculate the emf of the cell containing chromium and cadmium electrodes .

[Given : = 0.74 volt , = 0.40 volt ].

**Section – D [ 5 X 3 = 15 ]**

1. (a) The activation energy of a reaction is 94.14 kJ/mol and the value of rate constant at 313 K is 1.8 x
2. – 5 sec– 1 . Calculate the frequency factor A.

(b) The rate constant of a reaction at 700 K and 760 K are 0.011 M – 1  s – 1 and 0.105 M – 1  s – 1 respectively.

Calculate the values of Arrhenius parameters

Or

1. Calculate the freezing point of a solution containing 0.5 g KCl (Molar mass = 74.5 g/mol) dissolved in 100 g water, assuming KCl to be 92 % ionized. [Kf for water = 1.86 K kg/mol].
2. A 0.1539 molal aqueous solution of cane sugar (molar mass 342) has a freezing point of 271 K while the freezing point of pure water is 273.15 K. What will be the freezing point of an aqueous solution containing 5 g of glucose per 100 g of solution?
3. Name the following coordination compounds using I.U.P.A.C. system :

|  |  |  |
| --- | --- | --- |
| a) [Cr(PPh3) (CO)5] | b) [CoCl (NO2)(en)2]+ | c) [PtCl (NH2CH3)(NH3)2] Cl |
| d) [Co(NH3)3 (NO2)3] | e) [Ni(dmg)2] |  |

1. Write down the formulae of the following co-ordination compounds :

|  |  |
| --- | --- |
| 1. potassium hexacyanoferrate (III) | 1. bis (acetylacetonato) oxovanadium (IV) |
| 1. dichlorotetraamminecobalt (III) ion | 1. potassium pentacyanonitrosylcobaltate (III) |
| 1. chloridobis (ethylene diamine) nitrocobalt (III) ion | |