QB365 Question Bank Software Study Materials

Electro Chemistry 50 Important 1 Marks Questions With Answers (Book Back and Creative)

12th Standard

Chemistry

Total Marks : 50

Multiple Choice Question

50 x 1 = 50

1) The number of electrons that have a total charge of 9650 coulombs is_____.

(a) 6.22×10^{23} (b) 6.022×10^{24} **(c) 6.022×10^{22}** (d) 6.022×10^{-34}

2) Consider the following half cell reactions.

$Mn^{2+} + 2e^- \rightarrow Mn$ $E^o = -1.18V$

$Mn^{2+} \rightarrow Mn^{3+} + e^-$ $E^o = -1.51V$

The E^o for the reaction $3Mn^{2+} \rightarrow Mn + 2Mn^{3+}$, and the possibility of the forward reaction are respectively.

(a) 2.69V and spontaneous **(b) -2.69 and non spontaneous** (c) 0.33V and Spontaneous

(d) 4.18V and non spontaneous

3) The button cell used is watches function as follows

$Zn\ (s) + Ag_2O\ (s) + H_2O\ (l) \rightleftharpoons 2Ag\ (s) + Zn^{2+}\ (aq) + 2OH^-(aq)$ the half cell potentials are $Ag_2O\ (s) + H_2O\ (l) + 2e^- \rightarrow 2Ag\ (s) + 2OH^-\ (aq)$ $E^o = 34V$ and $Zn\ (s) \rightarrow Zn^{2+}\ (aq) + 2e^-$ $E^0 = 0.76V$. The cell potential will be_____.

(a) 0.84V (b) 1.34V **(c) 1.10V** (d) 0.42V

4) The molar conductivity of a 0.5 mol dm^{-3} solution of $AgNO_3$ with electrolytic conductivity of 5.76×10^{-3} S cm^{-1}at 298 K is_____.

(a) 2.88 S cm^2mol^{-1} **(b) 11.52 S cm^2mol^{-1}** (c) 0.086 S cm^2mol^{-1} (d) 28.8 S cm^2mol^{-1}

5)

Electrolyte	KCl	KNO_3	HCl	NaOAC	NaCl
Λ_- ($Scm^2\ mol^{-1}$)	149.9	145.0	426.2	91.0	126.5

Calculate Λ^o_{HoAC} using appropriate molar conductances of the electrolytes listed above at infinite dilution in water at 25°C_____.

(a) 517.2 (b) 552.7 **(c) 390.7** (d) 217.5

6) Faraday constant is defined as_____.

(a) charge carried by 1 electron **(b) charge carried by one mole of electrons**

(c) charge required to deposit one mole of substance (d) charge carried by 6.22×10^{10} electrons

7) How many faradays of electricity are required for the following reaction to occur $MnO_4^- \rightarrow Mn^{2+}$

(a) 5F (b) 3F (c) 1F (d) 7F

8) A current strength of 3.86 A was passed through molten Calcium oxide for 41 minutes and 40 seconds. The mass of Calcium in grams deposited at the cathode is_____. (atomic mass of Ca is 40g / mol and 1F = 96500C).

(a) 4 **(b) 2** (c) 8 (d) 6

9) During electrolysis of molten sodium chloride, the time required to produce 0.1mole of chlorine gas using a current of 3A is _____.

(a) 55 minutes **(b) 107.2 minutes** (c) 220 minutes (d) 330 minutes

10) The number of electrons delivered at the cathode during electrolysis by a current of 1A in 60 seconds is ____. (charge of electron = 1.6×10^{-19}C)

(a) 6.22×10^{23} (b) 6.022×10^{20} **(c) 3.75×10^{20}** (d) 7.48×10^{23}

11) Which of the following electrolytic solution has the least specific conductance?

(a) 2N **(b) 0.002N** (c) 0.02N (d) 0.2N

12) While charging lead storage battery _____.

(a) $PbSO_4$ on cathode is reduced to Pb (b) $PbSO_4$ on anode is oxidised to PbO_2 **(c) $PbSO_4$ on anode is reduced to Pb**

(d) $PbSO_4$ on cathode is oxidised to Pb

13) Among the following cells

I) Leclanche cell

II) Nickel – Cadmium cell

III) Lead storage battery

IV) Mercury cell

Primary cells are ____.

(a) I and IV (b) I and III (c) III and IV (d) II and III

14) Zinc can be coated on iron to produce galvanized iron but the reverse is not possible. It is because _____.

(a) Zinc is lighter than iron (b) Zinc has lower melting point than iron

(c) Zinc has lower negative electrode potential than iron **(d) Zinc has higher negative electrode potential than iron**

15) In H_2-O_2 fuel cell the reaction occur at cathode is _____.

(a) $O_{2(g)} + 2H_2O_{(l)} + 4e^- \rightarrow 4OH^-_{(aq)}$ (b) $H^+(aq) + OH^-(aq) \rightarrow H_2O(l)$ (c) $2H_2(g) + O_2(g) \rightarrow 2H_2O(g)$

(d) $H^+ + e^- \rightarrow 1/2\ H_2$

16) The equivalent conductance of M/36 solution of a weak monobasic acid is 6 mho cm^2 $equivalent^{-1}$ and at infinite dilution is 400 mho cm^2 $equivalent^{-1}$. The dissociation constant of this acid is _____.

(a) 1.25×10^{-6} **(b) 6.25×10^{-6}** (c) 1.25×10^{-4} (d) 6.25×10^{-5}

17) A conductivity cell has been calibrated with a 0.01M, 1:1 electrolytic solution (specific conductance ($k = 1.25 \times 10^{-3} cm^{-1}$) in the cell and the measured resistance was 800 Ω at 25°C. The cell constant is _____.

(a) $10^{-1}\ cm^{-1}$ (b) $10^{1}\ cm^{-1}$ **(c) $1\ cm^{-1}$** (d) 5.7×10^{-12}

18) Conductivity of a saturated solution of a sparingly soluble salt AB (1:1 electrolyte) at 298K is 1.85×10^{-5} S m^{-1}. Solubility product of the salt AB at 298K $(\Lambda^o_m)_{AB} = 14 \times 10^{-3}$ S m^2 mol^{-1}.

(a) 5.7×10^{-12} (b) 1.32×10^{-12} (c) 7.5×10^{-12} **(d) 1.74×10^{-12}**

19) In the electrochemical cell: $Zn|ZnSO_{4\ (0.01M)}||\ CuSO_{4\ (1.0M)}|Cu$, the emf of this Daniel cell is E_1. When the concentration of $ZnSO_4$ is changed to 1.0M and that $CuSO_4$ changed to 0.01M, the emf changes to E_2. From the above, which one is the relationship between E_1 and E_2?

(a) $E_1 < E_2$ **(b) $E_1 > E_2$** (c) $E_2 \geq E_1$ (d) $E_1 = E_2$

20) Consider the change in oxidation state of Bromine corresponding to different emf values as shown in the diagram below:

$$BrO_4^- \xrightarrow{1.82V} BrO_3^- \xrightarrow{1.5V} HBrO \xrightarrow{1.595v} Br_2 \xrightarrow{1.0652V} Br^-$$

Then the species undergoing disproportional is

(a) Br_2 (b) BrO_4^- (c) BrO^-_3 **(d) HBrO**

21) A certain current liberated 0.504gm of hydrogen in 2 hours. How many grams of copper can be liberated by the same current flowing for the same time in a copper sulphate solution _____.

(a) 31.75 **(b) 15.8** (c) 7.5 (d) 63.5

22) A gas X at 1 atm is bubbled through a solution containing a mixture of $1MY^-$ and $1MZ^-$ at 25°C. If the reduction potential of Z > Y > X, then_____.

(a) Y will oxidize X and not Z (b) Y will oxidize Z and not X (c) Y will oxidize both X and Z

(d) Y will reduce both X and Z

23) Cell equation: $A + 2B^- \rightarrow A^{2+} + 2B$; $A^{2+} + 2e^- \rightarrow A$ $E^o = +0.34V$ and $\log_{10} K = 15.6$ at 300K for cell reactions find E^o for $B^+ + e^- \rightarrow B$

(a) 0.80 (b) 1.26 (c) -0.54 (d) -10.94

24) name is

(a) yoga (b) sneha

25) Which one of the following solution has highest equivalent conductance?

(a) 0.1 M NaCl (b) 0.05 M NaCl **(c) 0.005 M NaCl** (d) 0.25 M NaCl

26) Faraday's laws of electrolysis are related to _____.

(a) atomic number of the cation (b) atomic number of the anion **(c) equivalent weight of the electrolyte**

(d) speed of the cation

27) The equivalent conductivity of CH_3COOH at 25°C is 80 ohm^{-1} cm^2 eq^{-1} and at infinite dilution 400 ohm^{-1} cm^{-1} eq^{-1}. The degree of dissociation of CH_3COOH is _____.

(a) 1 **(b) 0.2** (c) 0.1 (d) 0.3

28) The important use of Kohlrausch's law is deducing the _____.

(a) λ_∞ value of weak electrolyte. (b) λ_∞ value of strong electrolyte. (c) λ_∞ value of weak electrolyte.

(d) λ_∞ value of weak electrolyte

29) If 0.2 ampere can deposit 0.1978 g of copper in 50 minutes, how much of copper will be deposited by 600 coulombs?

(a) 19.78 g (b) 1.978 g **(c) 0.1978 g** (d) 197.8 g

30) The potential of a single electrode is a half cell is called the _____.

(a) Reduction potential (b) Half-wave potential single electrode potential **(c) Single electrode potential**

(d) Cell potential

31) What will be the equilibrium constant for the reaction between $AgNO_3$ and metallic Z_n, where E^o_{cell} = 1.56V?

(a) 6.19×10^{52} (b) 619×10^{52} (c) 0.619×10^{25} (d) 6.19×10^{25}

32) The electrode where there is loss of electron is called _____.

(a) cathode **(b) anode** (c) salt bridge (d) cathode and anode

33) The overall reaction that takes place in an electrochemical cell is _____.

(a) oxidation (b) reduction (c) decomposition **(d) redox reaction**

34) The maximum work that can be derived from a chemical reaction is _____.

(a) $W_{max} = \Delta H$ **(b) $W_{max} = \Delta G$** (c) $W_{max} = \Delta E$ (d) $W_{max} = \Delta S$

35) The cell constant of a conductivity cell is _____.

(a) l x a (b) $\frac{a}{l}$ **(c) $\frac{l}{a}$** (d) $\frac{l^2}{a}$

36) $Zn_{(S)} / Zn^{2+}_{(aq)} || Cu^{2+}_{(Aq)} / Cu_{(s)}$

In the above cell diagram, the single vertical line represents _____.

(a) Salt bridge (b) Cathode (c) Anode **(d) Phase boundary**

37) The reaction that takes place in the cathode half cell in a Galvanic cell is _____.

(a) oxidation **(b) reduction** (c) redox (d) hydrolysis

38) The basis of kohlraush's law is _____.

(a) molar conductance **(b) limiting molar conductance** (c) specific conductance (d) limiting specific conductance

39) When a zinc metal strip is placed in a copper sulphate solution the blue colour of the solution fades and copper is deposited on the zinc strip as red - brown crust. The oxidation half cell reaction of the above process is represented as _____.

(a) $Cu^{2+}_{(aq)} + 2e^- \longrightarrow Cu_{(s)}$ (b) $Cu_{(s)} \longrightarrow Cu^{2+} + 2e^-$ **(c) $Zn_{(S)} \longrightarrow Zn^{2+}_{(aq)} + 2e^-$** (d) $Zn^{2+}_{(aq)} + 2e^- \longrightarrow Zn_{(s)}$

40) Debye constants A and B depend on _____.

(a) nature of the solvent (b) temperature (c) concentration of the solvent

(d) both nature of the solvent and temperature

41) The electrochemical process is carried out in a device called _____.

(a) cell (b) cathode (c) anode (d) electrode

42) The emf of the cell is measured in _____.

(a) ohm (b) amperes **(c) volts** (d) coulomb

43) When the emf of the cell is determined under standard conditions, it is called as _____.

(a) single electrode emf **(b) standard emf** (c) individuale mf (d) half cell emf

44) The unit of molar conductance is _____.

(a) $Sm^2\ mol^{-1}$ (b) Sm^2 mol (c) Sm^2 g eq^{-1} (d) Sm^2 g. eq

45) The value of 'B' in Debye- Huckel equation is given by _____.

(a) $\frac{82.4}{\sqrt{DT\eta}}$ **(b)** $\frac{8.20\times10^5}{\sqrt[3]{DT}}$ (c) $\frac{8.20\times10^{-5}}{\sqrt[3]{DT}}$ (d) $\frac{8.20\times10^5}{\sqrt{DT}}$

46) In Galvanic cells a single vertical bar represents _____.

(a) Phase boundary (b) Saft bridge (c) Anode (d) Cathode

47) In Galvanic cells a double vertical bar represents _____.

(a) Phase boundary **(b) Salt bridge** (c) Anode (d) Cathode

48) The electrolyte in Mercury button cell is _____.

(a) paste of KOH & ZnO (b) paste of KOH & MnO_2 (c) paste of NH_4CI & $ZnCl_2$ & H_2O (d) paste of NH_4CI & MnO_2

49) The electrolyte in lead storage battery is _____.

(a) dil.H_2SO_4 (b) 38% by mass of HNO_3 with density 1.2 g/mL (c) dil.HCI

(d) 38% by mass of H_2SO_4 with density 1.2 g/mL

50) When 0.1 mole MnO_4^{2-} is oxidised, the quantity of electricity required to completely oxidise MnO_4^{2-} into MnO_4^- is _____.

(a) 96500C (b) 2 x 96500C **(c) 9650C** (d) 96.5C