ELECTROCHEMISTRY

1) A dilute aqueous solution of Na_2SO_4 is electrolysed using platinum electrodes. The products at the anode and cathode are
(a) O_2 , H_2 (b) SO_2 , Na (c) O_2 , Na (d) $S_2O_8^{2-}$, H_2

2) The time required to liberate one gram equivalent of an element by passing one ampere current through its solution is
(a) 6.7 hrs (b) 13.4 hrs (c) 19.9 hrs **(d) 26.8 hrs**

3) Which of the following solution has highest equivalent conductance ?
(a) 0.01 M KCl (b) 0.05 M KCl (c) 0.02 M KCl **(d) 0.005 M KCl**

4) Which of the following expressions correctly represents the equivalent conductance at infinite dilution of $Al_2(SO_4)_3$. Given that $\lambda^{\circ}_{Al^{3+}}$ and $\lambda^{\circ}_{SO_4^{2-}}$ are the equivalent conductances at infinite dilution of the respective ions ?
(a) $2\lambda^{\circ}_{Al^{3+}} + 3\lambda^{\circ}_{SO_4^{2-}}$ **(b)** $\lambda^{\circ}_{Al^{3+}} + \lambda^{\circ}_{SO_4^{2-}}$ (c) $(\lambda^{\circ}_{Al^{3+}} + \lambda^{\circ}_{SO_4^{2-}})$ X 6 (d) $\frac{1}{3}\lambda^{\circ}_{Al^{3+}} + \frac{1}{2}\lambda^{\circ}_{SO_4^{2-}}$

5) Unit of ionic mobility is
(a) $m^2\ sec^{-1}\ volt^{-1}$ (b) $m\ s^{-1}$ (c) $m\ sec^{-1}\ volt$ (d) $m\ sec^{-1}\ volt^{-1}$

6) In the electrolytic cell, flow of electrons is from
(a) cathode to anode in the solution **(b) cathode to anode through external supply**
(c) cathode to anode through internal supply (d) anode to cathode through internal supply

7) Electrode potential of any electrode depends on :
(a) nature of the metal (b) temperature of the solution (c) molarity of the solution
(d) all of these

8) A hypothetical electrochemical cell is $\overset{\ominus}{A}|A^+(xM)\parallel B^+(yM)|\overset{\oplus}{B}$ The emf measured is + 0.20 V. The cell reaction is
(a) The cell reaction cannot be predicted **(b)** $A + B^+ \longrightarrow A^+ + B$ (c) $A^+ + B \longrightarrow A + B^+$
(d) $A^+ + e^- \longrightarrow A; B^+ + e^- \longrightarrow B$

9) Standard electrode potential of three metals X, Y and Z are -1.2 V, + 0.5 v and - 3.0 V respectively. The reducing power of these metals will be
(a) X > Y > Z (b) Y > Z > X (c) Y > X > Z **(d) Z > X > Y**

10) Which has the highest oxidizing power ?
(a) I_2 (b) Br_2 **(c) F_2** (d) Cl_2

11) If $E^{\circ}_{Fe^{2+}/Fe} = 0.441V$ and $E^{\circ}_{Fe^{3+}/Fe^{2+}} = 0.771V$ the standard EMF of the reaction $Fe + 2Fe^{3+} \longrightarrow 3Fe^{2+}$ will be
(a) 1.212 V (b) 0.111 V (c) 0.330 V (d) 1.653 V

12) A gas X at 1 atm is bubbled through a solution containing a mixture of 1M Y^- and 1M Z^- ions at 25°**C** . If the reduction potential of Z > Y > X, then
(a) Y will oxidize X but not Z (b) Y will oxidize both X and Z
(c) Y will oxidize Z but not X (d) Y will reduce both X and Z

13) Consider the following four electrodes : P = Cu^{2+} (0.0001 M)/Cu (s) Q = Cu^{2+} (0.1 M)/Cu (s) R = Cu^{2+} (0.01 M)/Cu (s) S = Cu^{2+} (0.001 M)/Cu (s) If the standard electrode potential of Cu^{2+}/Cu is + 0.34 V, the reduction potentials in volts of the above electrodes follow the order :
(a) P > S > R > Q (b) S > R > Q > P (c) R > S > Q > P **(d) Q > R > S > P**

14) If Zn^{2+} / Zn electrode is diluted 100 times, then the change in emf is
(a) increase of 59 mV **(b) decrease of 59 mV** (c) increase of 29.5 mV
(d) decrease of 29.5 mV

15) What will be the e.m.f of the given cell ? Pt | H_2 (P_1) | H^+ (aq) | H_2 (P_2) | Pt
(a) $\frac{RT}{F}In\frac{P_1}{P_2}$ **(b)** $\frac{RT}{2F}In\frac{P_1}{P_2}$ (c) $\frac{RT}{F}In\frac{P_2}{P_1}$ (d) none of these

16) The standard emf of a galvanic cell involving 3 moles of electrons in a redox reaction is 0.59 V. The equilibrium constant for the reaction of the cell is
(a) 10^{25} (b) 10^{20} (c) 10^{15} **(d) 10^{30}**

17) For the reduction of silver ions with copper metal, the standard cell potential was found to be + 0.46 V at 25°**C.** The value of standard Gibbs energy, ΔG° will be (F = 96500 C mol^{-1})
(a) - 98.0 kJ **(b) - 89.0 kJ** (c) - 89.0 J (d) - 44.5 kJ

18) Among the following cells Leclanche cell (I), Nickel-cadmium cell (II), Lead storage battery (III), Mercury cell (IV), primary cells are
(a) I and II (b) I and III (c) II and III **(d) I and IV**

19) Which one of the following statement is always true about the spontaneous cell reaction in a galvanic cell ?
(a) $E_{cell}^\circ > 0, \Delta G^\circ > 0, Q > K_c$ (b) $E_{cell}^\circ < 0, \Delta G^\circ < 0, Q < K_c$ **(c)** $E_{cell}^\circ > 0, \Delta G^\circ < 0, Q < K_c$
(d) $E_{cell}^\circ > 0, \Delta G^\circ < 0, Q > K_c$

20) The main factor (s) which affect corrosion is /are
(a) position of metal in electrochemical series (b) presence of CO_2 in water
(c) presence of impurities in metal (d) presence of protective coating

21) Which cell will measure standard electrode potential of copper electrode ?
(a) Pt (s) | H_2 (g, 0.1 bar) | H^+ (aq., 1 M) || Cu^{2+} (aq., 1 M) | Cu
(b) Pt (s) | H_2 (g, 1 bar) | H^+ (aq., 1 M) || Cu^{2+} (aq., 2 M) | Cu
(c) Pt (s) | H_2 (g, 1 bar) | H^+ (aq., 1 M) || Cu^{2+} (aq., 1 M) | Cu
(d) Pt (s) | H_2 (g, 1 bar) | H^+ (aq., 0.1 M) || Cu^{2+} (aq., 1 M) | Cu

22) Which of the following statement is correct ?
(a) E_{cell} and $\Delta_r G$ of cell reaction both are extensive properties
(b) E_{cell} and $\Delta_r G$ of cell reaction both are intensive properties
(c) E_{cell} is an intensive property while $\Delta_r G$ of cell reaction is an extensive property
(d) E_{cell} is an extensive property while $\Delta_r G$ of cell reaction is an intensive property

23) The difference between the electrode potentials of two electrodes when no current is drawn through the cell is called ----------
(a) Cell potential **(b) Cell emf** (c) Potential difference (d) Cell voltage

24) Which of the following statement is not correct about an inert electrode in a cell ?
(a) It does not participate in the cell reaction
(b) It provides surface either for oxidation or for reduction reaction
(c) It provides surface for conduction of electrons
(d) It provides surface for redox reaction

25) An electrochemical cell can behave like an electrolytic cell when --------
(a) $E_{cell} = 0$ (b) $E_{cell} > E_{ext}$ **(c) $E_{ext} > E_{cell}$** (d) $E_{cell} = E_{ext}$

26) Which of the statements about solutions of electrolytes is not correct ?
(a) Conductivity of solution depends upon size of ions
(b) Conductivity depends upon viscosity of solution
(c) Conductivity does not depend upon solvation of ions present in solution
(d) Conductivity of solution increases with temperature.

27) Using the data given below find out the strongest reducing agent.
$E^\ominus_{Cr_2O_7^{2-}/Cr^{3+}} = 1.33V$, $E^\ominus_{Cl_2/Cl^-} = 1.36V$ $E^\ominus_{MnO_4^-/Mn^{2+}} = 1.51V$, $E^\ominus_{Cr^{3+}/Cr} = -0.74V$
(a) Cl^- **(b) Cr** (c) Cr^{3+} (d) Mn^{2+}

28) Use the data given in Q.8 and find out which of the following is the strongest oxidising agent.
(a) Cl^- (b) Mn^{2+} **(c) MnO_4^-** (d) Cr^{3+}

29) Using the data given Q.8 find out in which option the order of reducing power is correct.
(a) $Cr^{3+} < Cl^- < Mn^{2+} < Cr$ **(b) $Mn^{2+} < Cl^- < Cr^{3+} < Cr$**
(c) $Cr^{3+} < Cl^- < Cr_2O_7^{2-} < MnO^-_4$ (d) $Mn^{2+} < Cr^{3+} < Cl^- < Cr$

30) Use the data given in Q.8 find out the most stable ion in its reduced form.
(a) Cl^- (b) Cr^{3+} (c) Cr **(d) Mn^{2+}**

31) Use the data of Q.8 and find out the most stable oxidised species.
(a) Cr^{3+} (b) MnO_4^- (c) $Cr_2O_7^{2-}$ (d) Mn^{2+}

32) The quantity of charge required to obtain one mole of aluminium from Al_2O_3 is
(a) 1 F (b) 6 F **(c) 3 F** (d) 2 F

33) The cell constant of a conductivity cell ----------
(a) changes with change of electrolyte
(b) changes with change of concentration of electrolyte
(c) changes with temperature of electrolyte **(d) remains constant for a cell**

34) While charging the lead storage battery ----------
(a) $PbSO_4$ anode is reduced to Pb. (b) $PbSO_4$ cathode is reduced to Pb.
(c) $PbSO_4$ cathode is oxidised to Pb. (d) $PbSO_4$ anode is reduced to PbO_2

35) $\wedge^0_m(NH_4OH)$ is equal to ----------
(a) $\wedge^0_m(NH_4OH) + \wedge^0_m(NH_4Cl) - \wedge^0(HCl)$ **(b)** $\wedge^0_m(NH_4Cl) + \wedge^0_m(NaOH) - \wedge^0(NaCl)$
(c) $\wedge^0_m(NH_4Cl) + \wedge^0_m(NaCl) - \wedge^0(NaOH)$ (d) $\wedge^0_m(NaOH) + \wedge^0_m(NaCl) - \wedge^0(NH_4Cl)$

36) In the electrolysis of aqueous sodium chloride solution which of the half cell reaction will occur at anode ?
(a) $Na^+(aq) + e^- \longrightarrow Na(s); E^\ominus_{cell} = -2.71V$ **(b)** $2H_2O(l) \longrightarrow O_2(g) + 4H^+(aq) + 4e^-; E^\ominus_{cell} = 1.23V$
(c) $H^+(aq) + e^- \longrightarrow \frac{1}{2}H_2(g); E^\ominus_{cell} = 0.00V$ (d) $Cl^-(aq) \longrightarrow \frac{1}{2}Cl_2(g) + e^-; E^\ominus_{cell} = 1.36V$

37) The positive value of the standard electrode potential of Cu^{2+} /Cu indicates that ----------
(a) this redox couple is a stronger reducing agent than the H^+/H_2 couple.
(b) this redox couple is a stronger oxidising agent than the H^+/H_2
(c) Cu can displace H_2 from acid (d) Cu cannot displace H_2 from acid

38) $E^\ominus_{cell}$ for some half cell reactions are given below. On the basis of these mark the correct answer. $H^+(aq) + e^- \longrightarrow \frac{1}{2}H_2(g); \quad E^\ominus_{cell} = 0.00V$
$2H_2O(l) \longrightarrow O_2(g) + 4H^+(aq) + 4e^-; \quad E^\ominus_{cell} = 1.23V$ $2SO_4^{2-}(aq) \longrightarrow S_2O_8^{2-} + 2e^-; \quad E^\ominus_{cell} = 1.96V$
(a) In dilute sulphuric acid solution, hydrogen will be reduced at cathode
(b) In concentrated sulphuric acid solution, water will be oxidised at anode
(c) In dilute sulphuric acid solution, water will be oxidised at anode
(d) In dilute sulphuric acid solution, SO_4^{2-} ion will be oxidised to tetrahionate ion at anode

39) $E^\ominus_{cell} = 1.1V$ for Daniell cell. Which of the following expressions are correct description of state of equilibrium in this cell ?
(a) 1.1 = K_c **(b)** $\frac{2.303RT}{2F}\log K_c = 1.1$ (c) $\log K_c = \frac{2.2}{0.059}$ (d) $\log K_c = 1.1$

40) Conductivity of an electrolytic solution depends on ----------
(a) nature of electrolyte (b) concentration of electrolyte (c) power of AC source
(d) distance between the electrodes

41) $\wedge^0_m(H_2O)$ is equal to ----------
(a) $\wedge^0_m(HCl) + \wedge^0_m(NaOH) - \wedge^0_m(NaCl)$ (b) $\wedge^0_m(HNO_3) + \wedge^0_m(NaNO_3) - \wedge^0_m(NaoH)$
(c) $\wedge^0_m(HNO_3) + \wedge^0_m(NaoH) - \wedge^0_m(NaNO_3)$ (d) $\wedge^0_m(NH_4OH) + \wedge^0_m(HCl) - \wedge^0_m(NH_4Cl)$

42) What will happen during the electrolysis of aqueous solution of $CuSO_4$ by using platinum electrodes ?

(a) Copper will deposit at cathode (b) Copper will deposit at anode

(c) Oxygen will be released at anode (d) Copper will dissolve at anode

43) What will happen during the electrolysis of aqueous solution of $CuSO_4$ in the presence of Cu electrodes ?

(a) Copper will deposit at cathode (b) Copper will dissolve at anode

(c) Oxygen will be released at anode (d) Copper will deposit at anode

44) Conductivity k, is equal to ---------

(a) $\frac{1}{R}\frac{l}{A}$ (b) $\frac{G^*}{R}$ (c) $\wedge^m$ (d) $\frac{l}{A}$

45) Molar conductivity of ionic solution depends on -------

(a) temperature (b) distance between electrodes

(c) concentration of electrolytes in solution (d) surface area of electrodes

46) For the given cell, $Mg|Mg^{2+}||Cu^{2+}|Cu$

(a) Mg is cathode **(b) Cu is cathode** (c) The cell reaction is $Mg + Cu^{2+} \longrightarrow Mg^{2+} + Cu$

(d) Cu is the oxidising agent

47) What current is to be passed for 0.25 s for deposition of a certain weight of metal which is equal to its electrochemical equivalent ?

(a) 4 A (b) 100 A (c) 200 A (d) 2 A

48) In an experiment 0.04 F was passed thorugh 400 ml of 1 M solution of NaCl. What would be the pH of the solution after the electrolysis ?

(a) 8 (b) 10 **(c) 13** (d) 6 (e) 9

49) Electrolysis of dilute aqueous NaCl solution was carried out by passing 10 milli ampere current. The time required to liberate 0.01 mol of H_2 gas at the cathode is (1 Faraday = 96500 C mol^{-1})

(a) 9.65 x 10^4 sec **(b) 19.3 x 10^4 sec** (c) 28.95 x 10^4 sec (d) 38.6 x 10^4 sec

50) Two faradays of electricity are passed through a solution of $CuSO_4$. The mass of copper deposited at the cathode (at mass of Cu = 63.5 amu)

(a) 2 g (b) 127 g **(c) 0 g** (d) 63.5 g

51) Represent the galvanic cell in which the reactions is $Zn(s) + Cu^{2+}(aq) \rightarrow Zn^{2+}(aq) + Cu(s)$

Answer : $Zn|ZnSO_4(1M)||CuSO_4(1M)|Cu(s)$

52) What is meant by 'limiting molar conductivity'?

Answer : Limiting molar conductivity is equal to maximum conductance when solution is very-very dilute such that there is no further increase in molar conductance on further dilution.

53) What is primary cell? Give an example.

Answer : It is cell in which products cannot be changed into reactants back i.e. it is not rechargeable e.g. dry cell, mercury cell. In this cell,electrical energy is produced by the redox reaction occurring in the cell.

54) Rusting of iron is quicker in saline water than in ordinary water. Why is it so?

Answer : In saline water, NaCl helps water to dissociate into H^+ and OH^- . Greater the number of H^+ , quicker will be rusting.

55) Define specific conductivity (specific conductance).

Answer : Specific conductance is defined as conductance of electrolyte when distance between electrodes is 1 cm and area of cross section is 1 cm^2 .

56) What is meant by cell constant?

Answer : Cell constant is the ratio of distance between electrodes and area of cross-section. It is denoted by $\frac{l}{A}$. Its unit is cm^{-1} . Its SI unit is m^{-1}.

57) The standard reduction potential for Zn^{2+} (aq)/Zn(s) is - 0.76 V. Write the reactions occurring at the electrodes when coupled with NHE or SHE (standard hydrogen electrode).
Answer : $Zn \rightarrow Zn^{2+} + 2e^-$ **is reaction at anode when Zn is coupled with NHE or SHE (Standard Hydrogen Electrode).** $2H^+ + 2e^- \rightarrow H_2$ **at cathode.**

58) E^o (reduction potential) of Cu and Zn are +0.34 V and - 0.76 V respectively. Which of them is stronger reducing agent?
Answer : Zn is stronger reducing agent because it has lower standard reduction potential than that of Cu.

59) Predict whether F_2 and Na will react with one another. Give reason.
$E^o_{F_2/F^-} = +2.87 \quad V, E^o_{Na^+Na} = -2.71 \quad V$
Answer : $E^o_{cell} = E^o_{F_2/F^-} - E_{Na^+Na}$ **= + 2.87- (-2.71) = 2.87 + 2.71 = 5.58 V Since** E^o_{cell} **is + ve,** $\triangle G^o$ **will be -ve, reaction will take place. Na will react with** F_2 **.**

60) If E^o for the reaction $Fe^{3+}(aq) + e^- \rightarrow Fe^{2+}(aq)$ is + 0.77 V, what will be E^o value for the reaction $2Fe^{3+}(aq) + 2e^- \rightarrow 2Fe^{2+}(aq)$?
Answer : E^o = 0.77 V, i.e. e.m.f. of cell will remain the same for reaction $2Fe^{3+}(aq) + 2e^- \rightarrow 2Fe^{2+}(aq)$ **.**

61) Zinc dissolves in dilute acids to give Zn^{2+} . The electrode potential of cell when it is coupled with SHE and acts as anode, is 0.76 V. What is the standard electrode potential of Zn^{2+} /Zn?
Answer : $E^o_{Zn^{2+}/Zn}$ **= - 0.76 V because it acts as anode when coupled with SHE, i.e. it undergoes oxidation, therefore, oxidation potential is + ve and sign of reduction potential will be negative.**

62) What products are obtained at cathode and anode when molten $PbBr_2$ is electrolysed?
Answer : $PbBr_2 \rightarrow Pb^{2+} + 2Br^-$ **(molten) At cathode** $Pb^{2+}(aq) + 2e^- \rightarrow Pb(s)$ **. At anode** $2Br^-(aq) - 2e^- \rightarrow Br_2(g)$ **.**

63) What are the products obtained during electrolysis of $CuSO_4$ using Pt electrode?
Answer : $CuSO_4 \rightarrow Cu^{2+} + SO_4^{2-} \quad H_2O \rightarrow H^+ + OH^-$ **At cathode** $Cu^{2+} + 2e^- \rightarrow Cu(s)$ **, At anode** $2OH^- \rightarrow O_2 + 4H^+ + 4e^-$ **or** $2H_2O \rightarrow O_2 + 4H^+ + 4e^-$ **. Copper is formed at cathode and oxygen gas is liberated at anode.**

64) Complete: $\Lambda^o Na_2SO_4 =$
Answer : $\Lambda^\infty_m Na_2SO_4 = 2\lambda^\infty_m Na^+ + \lambda^\infty_m SO_4^{2-}$ **or** $\Lambda^o Na_2SO_4 = 2\lambda^o Na^+ + \lambda^o SO_4^{2-}$

65) Write the correct representation of cell: 2Cr(s)+3Cd^{2+} (aq) $\rightarrow$ 2Cr^{3+}(aq)+3Cd(s).
Answer : $Cr(s)\left|Cr^{3+}(aq)\right|\left|Cd^{2+}(aq)\right|Cd(s)$

66) $Fe^{3+}(aq) + e^- \rightarrow Fe^{2+}(aq), E^o = +0.77 \quad VCl_2(g) + 2e^- \rightarrow 2Cl^-(aq), E^o = +1.36 \quad V$ Write the reaction which could be feasible using above half cells.
Answer : $E^o_{cell} = E^o_{cathode} - E^o_{anode} = +1.36V - (0.77V)$ **= 0.59 V**
$2Fe^{2+}(aq) + Cl_2(g) \rightarrow 2Fe^{3+}(aq) + 2Cl^-(aq)$

67) Calculate the E^o_{cell} of the following electrode reactions:
$Zn^{2+}(aq) + 2e^- \rightarrow Zn(s), \quad E^o = -0.76 \quad V$, $Cd^{2+}(aq) + 2e^- \rightarrow Cd(s), \quad E^o = -0.40 \quad V$.
Answer : $E^o_{cell} = E^o_{Cd^{2+}/Cd} - E_{Zn^{2+}/Zn} \quad E^o_{cell} = -0.40 \quad V - (-0.76 \quad V) = +0.36 \quad V$

68) How many Faradays of charge are required to convert: 1 mole of MnO_4^- to Mn^{2+} ion,
Answer : $MnO_4^- \rightarrow Mn^{2+}, Mn^{7+} + 5e^- \rightarrow Mn^{2+} MnO_4^- + 5e^- + 8H^+ \rightarrow Mn^{2+} + 4H_2O$ **i.e. when 1 mole of** MnO_4^- **changes to** Mn^{2+} **, 5 Faradays of charge is required.**

69) What mass of zinc (II) ion will be reduced by 1 mole of electrons?
Answer : $Zn^{2+}(aq) + 2e^- \rightarrow Zn(s)$ **2 Faradays. i.e. 2 moles of electrons will deposit 65g of zinc. 1 Faradays, i.e. 1 mole of electrons will deposit 32.5 g of zinc.**

70) HCI does not give an acidic solution in benzene. Why?
Answer : HCI does not give acidic solution in benzene because it does not dissociate into ions in benzene because benzene is non-polar solvent, whereas HCI is polar.

71) Can you store copper sulphate solutions in a zinc pot? $E^o_{Cu^{2+}/Cu}$=+0.34 V $E^o_{Zn^{2+}/Zn}$= -0.76 V
Answer : No, because zinc can displace copper from $CuSO_4$ solution. Secondly $E^o_{cell} = E^o_{Cu^{2+}/Cu} - E^o_{Zn^{2+}/Zn}$ = +0.34 V - (0.76V) = +1.10 V Since E^o_{cell} is +ve, $\triangle G^o$ will be negative, reaction will take place, so, we cannot store $CuSO_4$ in zinc container.

72) Why does the conductivity of a solution decrease with dilution?
Answer : Conductivity of a solution decreases with dilution because number of ions per unit volume decreases.

73) Consider the reaction: $Cr_2O_7^{2-} + 14H^+ + 6e^- \rightarrow 2Cr^3 + 7H_2O$ What is the quantity of electricity in coulombs needed to reduce 1 mol of $Cr_2O_7^{2-}$?
Answer : $Cr_2O_7^{2-} + 14H^+ + 6e^- \rightarrow 2Cr^3 + 7H_2O$.$6 \times 96500C = 579000C$ of electricity is required to reduce 1 mol of $Cr_2O_7^{2-}$ to Cr^{3+}.

74) Suggest two materials other than hytrogen that can be used as fuels in fuel cells.
Answer : CH_4 and CO can be used in fuel cell instead of hydrogen.

75) Can absolute electrode potential of an electrode be measured?
Answer : No

76) Can E^o_{cell} or $\triangle_r G^o$ for a cell reaction ever be equal to zero?
Answer : No

77) Under what condition os E_{cell} = 0 or $\triangle_r G$ = 0?
Answer : When the cell reaction reaches equilibrium.

78) What does the negative sign in expression $E^o_{Zn^{2+}/Zn}$ =-0.76 V mean?
Answer : It means zinc is more reactive than hydrogen, therefore, acts as anode when coupled to S.H.E and gets oxidised to Zn^{2+} (aq) and H^+ will get reduced to H_2 (g).

79) Depict the galvanic cell in which the cell reaction is $Cu(s) + 2Ag^+(aq) \rightarrow 2Ag(s) + Cu^{2+}(aq)$
Answer : $Cu(s)\left|Cu^{2+}(aq)\right|\left|Ag^+(aq)\right|Ag(s)$

80) What is electrode potential?
Answer : A potential difference between the electrode and the electrolyte is called electrode potential.

81) Why is alternating current used for measuring resistance of an electrolytic solution?
Answer : It is used so as to prevent electrolysis so that concentration of ions in solution remains constant.

82) How will pH of brine (aq.NaCI solution) be affected when it is electrolysed?
Answer : It will increase due to formation of NaOH.

83) Unlike dry cell, the mercury cell has a constant cell potential throughout its useful life. Why?
Answer : It is because ions are not involved in overall cell reaction of mercury cell.

84) In an aqueous solution how does specific conductivity of electrolytes change with addition of water?
Answer : It decreases as number of ions per unit volume decreases.

85) Which reference electrode is used to measure the electrode potential of other electrodes?
Answer : Standard hydrogen electrode.

86) Consider a cell given below: $Cu\left|Cu^{2+}\right|\left|CI^-\right|CI_2, Pt$. Write reactions that occur at anode and cathode.
Answer : $Cu \rightarrow Cu^{2+} + 2e^-$ At anode, $Cl_2 + 2e^- \rightarrow 2Cl^-$ At cathode.Cu is anode because it is getting oxidised,Cl_2 is cathode as it is getting reduced.

87) The arrangement which converts chemical energy of a redox reaction into electrical energy is called ----------
Answer : electrochemical cell or volatic cell or galvanic cell

88) The arrangement in which electrical energy supplied brings about a redox reaction is called ----------
Answer : electrolytic cell

89) Electrolysis of an aqueous solution of sodium chloride produces ---------- at the cathode and ---------- at the anode.
Answer : H_2 , Cl_2

90) Electrolysis of an aqueous solution of copper sulphate using platinum electrodes produces ---------- at the cathode and ---------- at the anode.
Answer : Cu, O_2

91) The mass of the substance deposited when one coulomb of electricity is passed through its solution is called ---------- of the substance.
Answer : electrochemical equivalent

92) The mass of the substance deposited when one faraday of charge is passed through its solution is equal to --------- of the substance.
Answer : gram equivalent weight

93) In terms of SI base a units, ohm (Ω) = ----------
Answer : kg m^2 s^{-3} A^{-2}

94) Conductivity is the conductance of ---------- of the solution and its units are ----------
Answer : 1 cm^3 or 1 m^3 , Ω^{-1} cm^{-1} or S m^{-1}

95) If k is the specific conductivity of a solution with volume V containing 1 g eq of the electrolyte and $\wedge$ is the equivalent conductivity, then k, $\wedge$ and V are related as ----------
Answer : $\wedge$ = k X V

96) If every quantity is expressed in SI units, then molar conductivity ($\wedge_m$), conductivity (k) and molarity (M) are related as ----------
Answer : $\wedge_m$ = $\frac{k}{M}$

97) Conductivity (k), conductance (G) and all constant (G^*) are related as ---------
Answer : k = G x G^*

98) The units of cell constant are ----------
Answer : cm^{-1} or m^{-1}

99) Out of specific, equivalent and molar conductivities, the quantity which decreases with dilution is ----------
Answer : specific conductivity

100) According to Debye-Huckel-Onsager equation $\wedge_m{}^c =$ ----------
Answer : $\wedge_m{}^c = \wedge_m{}^\circ - A\sqrt{c}$