Cell constant and Electrochemical Cells

26. If the conductance and specific conductance of a solution is one then its cell constant would be
(a) 1 (b) Zero
(c) 0.5 (d) 4

27. Saturated solution of KNO_3 is used to make 'salt-bridge' because
(a) Velocity of K^+ is greater than that of NO_3^-
(b) Velocity of NO_3^- is greater than that of K^+
(c) Velocities of both K^+ and NO_3^- are nearly the same
(d) KNO_3 is highly soluble in water

28. In balancing the half reaction $S_2O_3^{2-} \rightarrow S_{(s)}$ the number of electrons that must be added is
(a) 4 on the left (b) 3 on the right
(c) 2 on the left (d) 2 on the right

29. Which one of the following statement is true for a electrochemical cell
(a) H_2 is cathode and Cu is anode
(b) H_2 is anode and Cu is cathode
(c) Reduction occurs at H_2 electrode
(d) Oxidation occurs at Cu electrode

30. In the reaction

$Cu(s) + 2Ag^+(aq) \rightarrow Cu^{2+}(aq) + 2Ag(s)$

The reduction half-cell reaction is
(a) $Cu + 2e^- \rightarrow Cu^{2-}$
(b) $Cu - 2e^- \rightarrow Cu^{2+}$
(c) $Ag^+ + e^- \rightarrow Ag$
(d) $Ag - e^- \rightarrow Ag^+$

31. Which of the following statements about galvanic cell is incorrect
(a) Anode is positive
(b) Oxidation occurs at the electrode with lower reduction potential
(c) Cathode is positive
(d) Reduction occurs at cathode

32. The molar conductances of $NaCl, HCl$ and CH_3COONa at infinite dilution are 126.45, 426.16 and $91 ohm^{-1}cm^2mol^{-1}$ respectively. The molar conductance of CH_3COOH at infinite dilution is
(a) $201.28 ohm^{-1}cm^2mol^{-1}$
(b) $390.71 ohm^{-1}cm^2mol^{-1}$
(c) $698.28 ohm^{-1}cm^2mol^{-1}$
(d) $540.48 ohm^{-1}cm^2mol^{-1}$

33. The electrodes of a conductivity cell are $3cm$ apart and have a cross-sectional area of $4cm^2$. The cell constant of the cell (in cm^{-1}) is
(a) 4×3 (b) $4/3$
(c) $3/4$ (d) $9/4$

34. The anode half-reaction occurring during the discharge of a lead storage battery is

(a) $Pb(s) + SO_2 + O_2 \rightarrow PbSO_4(s)$

(b) $Pb(s) + SO_4^{2-}(aq) \rightleftharpoons PbSO_4(s) + 2e^-$

(c) $PbO_2(s) + 4H^+(aq) + 2e^- + SO_4^{2-}(aq) \rightleftharpoons PbSO_4(s) + 2H_2O$

(d) $Pb^{2+}(aq) + SO_4^{2-}(aq) \rightarrow PbSO_4(s)$

35. The unit of cell constant is

(a) $ohm^{-1}cm^{-1}$ (b) $ohmcm$

(c) cm (d) cm^{-1}

36. In dry cell the reaction which takes place at the zinc anode is

(a) $Zn^{2+} + 2e^- \rightarrow Zn(s)$

(b) $Zn(s) \rightarrow Zn^{2+} + 2e^-$

(c) $Mn^{2+} + 2e^- \rightarrow Mn(s)$

(d) $Mn(s) \rightarrow Mn^+ + e^- + 1.5V$

37. The chemical reaction taking place at the anode of a cell is

(a) Ionisation (b) Reduction

(c) Oxidation (d) Hydrolysis

38. Which of the following reactions occurs at the cathode during the charging of a lead storage battery

(a) $Pb^{2+} + 2e^- \rightarrow Pb$

(b) $Pb^{2+} + SO_4^{2-} \rightarrow PbSO_4$

(c) $Pb \rightarrow Pb^{2+} + 2e^-$

(d) $PbSO_4 + 2H_2O \rightarrow 2PbO_2 + 4SO_4^{2-} + 2e^-$

39. A depolarizer used in dry cell batteries is

(a) Ammonium chloride

(b) Manganese dioxide

(c) Potassium hydroxide

(d) Sodium phosphate

40. When a lead storage battery is discharged

(a) Fe^{2+} is evolved

(b) Lead sulphate is consumed

(c) Lead is formed

(d) Sulphuric acid is consumed

41. In electroplating, the article to be electroplated serves as

(a) Cathode (b) Electrolyte

(c) Anode (d) Conductor

42. The position of some metals in the electrochemical series in decreasing electropositive character is given as $Mg > Al > Zn > Cu > Ag$. What will happen, if a copper spoon is used to stir a solution of aluminium nitrate

(a) The spoon will get coated with Al

(b) An alloy of Cu and Al is formed

(c) The solution becomes blue

(d) There is no reaction

43. In a electrochemical cell

(a) Potential energy changes into kinetic energy
(b) Kinetic energy changes into potential energy
(c) Chemical energy changes into electrical energy
(d) Electrical energy changes into chemical energy

44. In galvanic cell, the salt bridge is used to
(a) Complete the circuit
(b) Reduce the electric resistance in the cell
(c) Separate cathode from anode
(d) Carry salts for the chemical reaction

45. If a strip of Cu metal is placed in a solution of ferrous sulphate
(a) Copper will precipitate out
(b) Iron will precipitate out
(c) Copper will dissolve
(d) No reaction will take place

46. Which of the following is not used to construct salt bridge
(a) CH_3COOK (b) KCl
(c) NH_4NO_3 (d) KNO_3

47. The reference electrode is made by using
(a) $ZnCl_2$ (b) $CuSO_4$
(c) $HgCl_2$ (d) Hg_2Cl_2

48. In a hydrogen – oxygen fuel cell, combustion of hydrogen occurs to
(a) Produce high purity water
(b) Create potential difference between the two electrodes
(c) Generate heat
(d) Remove adsorbed oxygen from electrode surfaces

49. $\lambda_{ClCH_2COONa} = 224 ohm^{-1}cm^2gmeq^{-1}$,
$\lambda_{NaCl} = 38.2 ohm^{-1}cm^2gmeq^{-1}$,
$\lambda_{HCl} = 203 ohm^{-1}cm^2gmeq^{-1}$,
What is the value of $\boldsymbol{\lambda_{ClCH_2COOH}}$
(a) 288.5 $ohm^{-1}cm^2gmeq^{-1}$
(b) 289.5 $ohm^{-1}cm^2gmeq^{-1}$
(c) 388.5 $ohm^{-1}cm^2gmeq^{-1}$
(d) 59.5 $ohm^{-1}cm^2gmeq^{-1}$

50. Which of the following statement is true for the electrochemical Daniel cell
(a) Electrons flow from copper electrode to zinc electrode
(b) Current flows from zinc electrode to copper electrode
(c) Cations move toward copper electrode which is cathode
(d) Cations move toward zinc electrode