CHEMISTRY

BOOKS - MARVEL CHEMISTRY (HINGLISH)

ELECTROCHEMISTRY

Multiple Choice Questions

1. The oxidation number of P in $Mg_2P_2O_7$ is

A. -3

B. $+2$

C. $+5$

D. $+3$

Answer: C

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2. Oxidation number of S in $S_2O_2^{-2}$ is

A. -2

B. $+1$

C. $+6$

D. 0

Answer: B

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3. When potassium permanganate is titrated against ferrous ammonoum sulphate, the equivalent weight of potassium permanganent is

A. $\dfrac{\text{molecular weight}}{10}$

B. $\dfrac{\text{molecular weight}}{5}$

C. $\frac{\text{molecular weight}}{2}$

D. molecular weight

Answer: B

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4. Oxidation state of oxygen in H_2O_2 is

A. -2

B. -1

C. $+1$

D. $+2$

Answer: B

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5. What will be the oxidation number of Fe in $K_3[Fe(CN)_6]$:-

A. $+2$

B. $+3$

C. $+1$

D. $+4$

Answer: B

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6. Oxidation number of 'N' in N_3H (hydrazoic acid) is :-

A. -3

B. $+3$

C. 0

D. $-\frac{1}{3}$

Answer: D

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7. Oxidation number of carbon in $H_2C_2O_4$ is

A. $+4$

B. $+3$

C. $+2$

D. -2

Answer: B

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8. Oxidation number of S in $Na_2S_4O_6$ is

A. $+6$

B. $+4$

C. $+1.5$

D. $+2.5$

Answer: D

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9. The oxidation number of oxygen in OF_2 is

A. -2

B. $+2$

C. -1

D. $+1$

Answer: B

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10. Which of the following will not conduct electricity ?

A. $K^{+}Cl^{-}$ (Aqueous solution)

B. $K^{+}Cl^{-}$ (Solid state)

C. $Na^{+}Cl^{-}$ (Fused state)

D. Graphite

Answer: B

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11. Which element has the highest electrical conductivity?

A. Gold

B. Platinum

C. Copper

D. Silver

Answer: D

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12. With increase in temperature of the conductivity of

A. decreases

B. increases

C. remains unchanges

D. none of the above

Answer: A

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13. Solid NaCl is a bad conductor of electricity because

A. in solid state there are no ions

B. solid NaCl is covalent

C. in solid NaCl, there is no movement of ions

D. in solid NaCl there are no electrons

Answer: C

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14. In which of the following solutions ions are present

A. Sucrose in water

B. Sulphur in CS_2

C. Cesium nitrate in water

D. Cyclohexanol in water

Answer: C

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15. Which of the following is a moderate conductor of electricity

A. Carbohydrates

B. Diamond

C. Graphite

D. Silicon

Answer: D

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16. Which of the following isnot a strong electrolyte?

A. Acetic acid

B. Aqueous KOH solution

C. Dilute HCl

D. Fused NaCl

Answer: A

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17. The reactions taking place at anode and cathode of a cell respectively are

A. hydrolysis

B. neutrolization

C. oxidation

D. reduction

Answer: D

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18. Which of the following reactions takes place at anode ?

A. $SO_4^{2-} + H_2O \to H_2SO_4 + 2e^-$

B. $H^+ + e^- \to \frac{1}{2}H_2$

C. $Ag^+ + e^- \to Ag$

D. $Fe^{+3} + e^- \to Fe^{2+}$

Answer: A

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19. Which reaction occurs at the anode during the electrlysis of fused lead bromide ?

A. $Pb^{2+} + 2e^- \to Pb$

B. $Pb \to Pb^{2+} + 2e^-$

C. $Br + e^- \to Br^-$

D. $Br^- \to Br + e^-$

Answer: A

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20. When water is electrolysed , volume of hydrogen and oxygen are evolved in the ratio of

A. $1:1$

B. $1:8$

C. $1:18$

D. $2:1$

Answer: D

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21. Which of the following ions will move towards anode during electrolysis of fused NaOH ?

A. Na^{+} ions

B. H^{+} ions

C. OH^{-} ions

D. O^{2-} ions

Answer: C

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22. Which of the following reactions will take place at anode during the electrolysis of copper sulphate using copper electrodes ?

A. $Cu(s) \rightarrow Cu^{2+}(aq) + 2e^{-}$

B. $Cu^{2-} \rightarrow Cu - 2e^{-}$

C. $H^{+} + e^{-} \rightarrow H$

D. $SO_4^{2-}(aq) + 2H^{+} \rightarrow H_2SO_4$

Answer: A

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23. The overall reaction taking place at anode during eelctrolysis of fused sodium chloride using suitable electrode is

A. oxidation of Cl^- ion

B. oxidation of Na^+ ions

C. reduction of Cl^- ions

D. reduction of Na^+ ions

Answer: A

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24. Which of the following is a redox reaction ?

A. $2F^{2+} \rightarrow Fe^{3+} + e^-$

B. $2Fe^{2+} + Cl_2 \rightarrow 2Fe^{3+} + 2Cl^-$

C. $Cl_2 + 2e^- \rightarrow 2Cl^-$

D. $Sn^{2+} \rightarrow Sn^{4+} + 2e^{-}$

Answer: B

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25. Which of the following is not a cathode reaction ?

A. $Ag^{+} \rightarrow Ag - e^{-}$

B. $Fe^{2+} \rightarrow Fe^{3+} + e^{-}$

C. $Cu^{2+} + 2e^{-} \rightarrow Cu$

D. $2H^{+} + 2e^{-} \rightarrow H_2$

Answer: B

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26. A half cell reaction is one that

A. takes place at one electrode

B. consumes half a unit of electricity

C. involves half a mole of eletrolyte

D. goes half way to completion

Answer: A

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27. Aqueous solution of HCl conducts electricity because it

A. ionises

B. dissociates

C. dimerises

D. forms hydrogen bond

Answer: A

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28. Electrode at which electrons flow into the electrolyte is

A. anode

B. cathode

C. electrode

D. may be anode or cathode

Answer: B

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29. Conductance of a solution of a strong electrolyte is measure of its

A. potential difference

B. concentration

C. reactance

D. dissociation

Answer: B

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30. Among Na, Hg, S, Pt and graphite, which can be used as electrodes in electrolystic cells having aqueous solutions?

A. Na and S

B. Hg and S

C. Na, Hg and S

D. Hg, Pt and graphite

Answer: D

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31. The products of the electrolysis of aq. Sodium chloride are

A. sodium , chloride

B. chlorine , hydrogen

C. hydrogen, oxygen

D. hydrogen, chloride , hydroxyl ion

Answer: B

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32. Which of the following substances would bahave differently than the other three when electric current is passed through their solutions in water ?

A. Washing soda

B. Alum

C. Sugar

D. Common salt

Answer: C

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33. 1 M solution of hydrochloric acid conducts more electricity than 1 M solution of acetic acid. This is because

A. Hydrogen chloride is highly soluble in water

B. Hydrochloric acid furnishes much larger ions than acetic acid

C. hydrochloric acid furnishes much less ions than acetic acid

D. hydrochloric acid is mineral acid while acetic acid is an organic acid

Answer: B

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34. In the process of electrolysis , the positive and negative ions of the electrolyte are

A. separated

B. hydrate

C. united

D. discharged

Answer: D

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35. When the electric current is passed through a cell having an electrolyte, the positive ions move towards cathode and negative ions toqards the anode. If the cathode is pulled out of the solution .

A. The positive and the negative ions both will move towards the anode.

B. The positive ions will start moving towards the anode, the negative ions will stop moving.

C. The negative ions will continue to move towards the anode, the positive ions will stop moving

D. The positive and negative ions will start moving randomly.

Answer: D

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36. On electrolysis of a solution of dilute H_2SO_4 between platinum electrodes , the gas evolved at the anoe is

A. SO_2

B. SO_3

C. O_2

D. H_2

Answer: C

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37. Which of the following will lose charge at cathode ?

A. ions

B. anions

C. cations

D. both (a) and (b)

Answer: C

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38. The reactions taking place at anode and cathode of a cell respectively are

A. reduction , oxidation

B. reduction, hydrolysis

C. oxidatino , reduction

D. hydrolysis , oxidation

Answer: C

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39. During the electrolysis, all the +ve ions move in

A. opposite directino to the charged electrons

B. same direction to the charged electrons

C. downwards direction due to gravity

D. upward direction

Answer: A

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40. The flow of electricity through an electolyte is due to the

A. movement of atoms

B. movement of molecules

C. movement of solvent

D. movement of ions

Answer: D

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41. Electrolytic cell is used to convert

A. electrical energy to chemcial energy

B. electrical energy to mechanical energy

C. mechanical energy to chemical energy

D. chemcial energy to electrical energy

Answer: A

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42. The study of electrochemistry is totally dependent on the concept of

A. endothemic reaction

B. exothermic reaction

C. redox reaction

D. double displacement

Answer: C

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43. In electroplating, the article to be electoplated serves as:

A. cathode

B. electrolyte

C. anode

D. conductor

Answer: A

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44. The reaction taking place at cathode is

A. hydrolysis

B. neutrolisation

C. oxidation

D. reduction

Answer: D

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45. In the electroplating of steel sppon by silver, steel spoon acts as

A. Electrolyte

B. Anode

C. Cathode

D. Insert electrode

Answer: C

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46. Electrolytic conductance is due to movement of

A. Protons

B. ions

C. electrons

D. atoms

Answer: B

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47. Electrolytic conduction is due to the movement of :

A. ions

B. neutrons

C. metallic kernels

D. electrons

Answer: D

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48. The effect of temperature increase on conduction as -

A. electrolytic conduction increases, metallic conduction decreases

B. metallic condcution decreases, electrolytic conduction decreases

C. both metallic and electrolytic conduction decrease

D. cannot predict

Answer: A

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49. Specific conductance is more for

A. $1MC_6H_{12}O_6$

B. $1MKCl$

C. $1MC_{12}H_{22}O_{11}$

D. 1 M Urea

Answer: B

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50. Molar conductance of $Al_2(SO_4)_3$ equals

A. equivalent conductance $\times \frac{1}{6}$

B. equivalent conductance

C. equivalent conductance $\times 6$

D. none of the above

Answer: C

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51. The units of molar conductance are

A. $\text{mole}^{-1}\text{cm}^{+1}\text{ohm}^{-1}$

B. $\text{ohm}^{-1}\text{cm}^{2}\text{mole}^{+1}$

C. $\text{ohm}^{-1}\text{cm}^{2}\text{mole}^{+1}$

D. $\mathrm{ohm}^{-1}\mathrm{dm}^3\mathrm{mole}^{-1}$

Answer: B

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52. Specific conductance for one molar aqueous solution is more for

A. LiCl

B. CsCl

C. NaCl

D. $MgCl_2$

Answer: B

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53. The dimensions of cell constant are

A. cm

B. L^{-1}

C. meter

D. Å^{-1}

Answer: B

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54. The specific conductance of a 0.12 N solution of an electrolyte is $2.4 \times 10^{-2} Scm^{-1}$. Calculate its equivalent conductance.

A. 100

B. 50

C. 200

D. 40

Answer: C

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55. The relationship between equivalent conductivity (λ), specific conductivity (K) and normality (xN) of a solution is

A. $K = \frac{1000 \times x}{\lambda}$

B. $\lambda = \frac{1000 \times K}{x}$

C. $\lambda = \frac{K}{1000 \times x}$

D. $K = \frac{\lambda}{1000 \times x}$

Answer: B

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56. The units of equivalent conductivity are

A. $\mathrm{ohm}^{-1} cm \mathrm{equiv}^{-1}$

B. ohm $cm^2 \mathrm{equiv}^{-1}$

C. $\mathrm{ohm}^{-1}\mathrm{cm}^2\mathrm{equiv}^{-1}$

D. ohm cm equiv

Answer: C

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57. The units of cell constant are

A. Ω cm

B. cm

C. cm^{-1}

D. dimensionless

Answer: C

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58. The two Pt electrodes fitted in a conductance cell are $1.5cm$ apart while the cross — sectional area of each electrode is $0.75cm$. What is the cell constant?

A. 1.125

B. 0.5 cm

C. $2.0cm^{-1}$

D. $0.2cm^{-1}$

Answer: C

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59. The ionic mobilities of the cation and the aniom of a salt A_2B are 140 and 80 $ohm^{-1}cm^2eq^{-1}$ respectively. The equivlent conductivity of salt at infinite dilution is (in $ohm^{-1}cm^2eq^{-1}$):

A. 160 mhos cm^2

B. 280 mhos cm^2

C. 60 mhos cm^2

D. 320 mhos cm^2

Answer: D

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60. The specific conductance in ohm- cm- of four electrolytes P, Q, R and S are given in brackets:

$P(5.0 \times 10^{-5}) \quad Q(7.0 \times 10^{-8})$
$R(1.0 \times 10^{-10}) \quad S(9.2 \times 10^{-3})$

The one that offer s highest resistance to the passage of electric current is:

A. P

B. S

C. R

D. Q

Answer: C

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61. Compute the molar conducitivity of a solution of $MgCl_2$ at infinite dilution. Given that $\lambda_{Mg}^{2+} = 106.12 ohm^{-1} cm^2 \text{mol}^{-1}$

$\lambda_{Cl}^{-} = 76.3 ohm^{-1} cm^2 \text{mol}^{-1}$

A. $25.88 \text{ohm}^{-1} cm^2 mol^{-1}$

B. $258.8 \text{ohm}^{-1} cm^2 mol^{-1}$

C. $2.588 \text{ohm}^{-1} cm^2 mol^{-1}$

D. $126.4 \text{ohm}^{-1} cm^2 mol^{-1}$

Answer: B

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62. Calculate the molar conductivity of a solution of NaCl at infinite dilution. Given

$\lambda^{\infty}(Na^{+}) = 50.11 \text{ohm}^{-1} cm^2 mol^{-1}$

$\lambda^{\infty}(Cl^{-}) = 76.34 \text{ohm}^{-1} cm^2 mol^{-1}$

A. $126.45 \text{ohm}^{-1} cm^2 mol^{-1}$

B. $127.45 \text{ohm}^{-1} cm^2 mol^{-1}$

C. $125.45 \text{ohm}^{-1} cm^2 mol^{-1}$

D. $100.22 \text{ohm}^{-1} cm^2 mol^{-1}$

Answer: A

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63. At 298 K the resistance of a 0.1M KCl solution is found to be 39.0ohm. If the conductivity (k) of this solution is 1.29 $\times 10^{-2} ohm^{-1} cm^{-1}$ at 298K, what is cell contant

A. $5.03 \times 10^{-1} cm^{-1}$

B. $10.06 \times 10^{-1} cm^{-1}$

C. $50.03 \times 10^{-1} cm^{-1}$

D. $2.51 \times 10^{-1} cm^{-1}$

Answer: A

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64. At 298K the resistance of a 0.5N NaOH solution is 35.0 ohm. The cell constant is 0.503 cm^{-1} the electrical conductivity of the solution is

A. $1.473 \times 10^{-2} \text{ohm}^{-1} cm^{-1}$

B. $1.473 \text{ohm}^{-1} cm^{-1}$

C. $14.73 \text{ohm}^{-1} cm^{-1}$

D. $0.1473 \text{ohm}^{-1} cm^{-1}$

Answer: A

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65. At 298K the electrolytic conductivity of a 0.2 M KCl solution is $2.5 \times 10^{-2} ohm^{-1} cm^{-1}$ compute its molar c onductivity.

A. $62.5 \mathrm{ohm}^{-1} cm^2 mol^{-1}$

B. $125 \mathrm{ohm}^{-1} cm^2 mol^{-1}$

C. $12.5 \mathrm{ohm}^{-1} cm^2 mol^{-1}$

D. $175 \mathrm{ohm}^{-1} cm^2 mol^{-1}$

Answer: B

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66. Calculate the degree of dissociation of 0.02 M acetic acid at 298K, given that

$\lambda_{CH_3COOH} = 11.7 ohm^{-1} cm^2 \mathrm{mol}^{-1}$

$\lambda_{(CH_3COO^-)} = 40.9 ohm^{-1} cm^2 \text{mol}^{-1}$

$\lambda(H^+)^\circ = 349.1 ohm^{-1} cm^2 \text{mol}^{-1}$

A. 0.06

B. 0.003

C. 0.03

D. 0.09

Answer: C

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67. The of the following solutions will have the highest specific conductance ?

A. 0.001 N

B. 0.0001 N

C. 0.1 N

D. 1.0 N

Answer: D

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68. Which of the following statement is not correct ?

A. The conductance of one cm^3 of a material is called specific conductance

B. Specific conductance increases while equivalent conductance decreases with dilution

C. The limiting equivalent conductances of weak electrolytes cannot be determined by extrapolation of the pot λ^0 against concentrtion

D. The conductivity of metals is due to the movement of electrons.

Answer: B

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69. The Kohlrausch's law is not related with

A. conductance of ions at infinite dilution

B. independent migration of ions

C. infinite dilute solution of non electrolytes

D. molar conductivity of electrolytes

Answer: C

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70. The specific conductance of N/50 solution of KCl at $25^{\circ}C$ is 0.2765 ohm^{-1}. If the resistance of the cell containing this solution is 400 ohms , then the cell constant is

A. $11.06cm^{-1}$

B. $.000066cm^{-1}$

C. $1.106 cm^{-1}$

D. $110.6 cm^{-1}$

Answer: D

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71. The increases in equivalent conductivity of a weak electrolyte with dilution is due to :

A. increase in number of ions per unit volume

B. increase in molecular attraction

C. increases in degree of association

D. increases in degree of ionisation of the substance

Answer: D

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72. At infinite dilution of an electrolyte, the equivalent conductance of cations at anions are .... of each other.

A. depends upon the nature of solvent

B. are independent of each other

C. depends on each other

D. none of the above

Answer: B

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73. The conductance of one cm cube of a solution is its

A. Resistance

B. Equivalent conductance

C. Specific conductance

D. Molar conductance

Answer: C

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74. The units of specific conductance (κ) are

A. $\text{ohm}^{-1} cm^{-1}$

B. $\text{mhos}^{-1} cm^{-1}$

C. ohm cm^{-1}

D. ohm dm^3

Answer: A

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75. Which of the following solution has higheset resistance ?

A. 1 N NaCl

B. 0.1 NaCl

C. 2 N NaCl

D. 0.05 NaCl

Answer: D

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76. AN increases in equivalent conductivity of strong electrolyte with dilution is mainly due to .

A. more and more ionization

B. increass in the mobility of ions

C. change in viscosity of solution

D. all of the above

Answer: B

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77. If the limiting molar conductance of KNO_3 is 126.3 $\text{ohm}^{-1}cm^2$ and of NO_3^- is 71.44 $\text{ohm}^{-1}cm^2$. The ionic conductance of K^+ is

A. 54.06 $\text{ohm}^{-1}cm^2$

B. 54.86 $\text{ohm}^{-1}cm^2$

C. 54.16 $\text{ohm}^{-1}cm^2$

D. 54.26 $\text{ohm}^{-1}cm^2$

Answer: B

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78. If C is concentration in gram mol per litre, then specific conductance (K) and molar conductance (λ) are related as

A. $\lambda = \dfrac{K \times 1000}{C}$

B. $\lambda = \dfrac{1000}{K \times C}$

C. $\lambda = \frac{K \times C}{1000}$

D. $\lambda = 1000 \times K \times C$

Answer: A

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79. The specific conductance at 289 K of AgCl is $1.826 \times 10^{-6} ohm^{-1} cm^{-1}$. The ionic conductance of Ag^{+} and Cl^{-} are 61.92 and 61.92 and 76.36 respectively. What is the solubility of AgCl in water?

A. $2.1 \times 10^{-4} gL^{-1}$

B. $2.1 \times 10^{-5} gL^{-1}$

C. $1.9 \times 10^{-3} gL^{-1}$

D. $2.1 \times 10^{-6} gL^{-1}$

Answer: C

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80. One faraday is equal to

A. 96.5 coulombs

B. 96500 coulombs

C. 6.023×10^{23} coulombs

D. 96.5×10^{-1} coulombs

Answer: B

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81. The quantigy of electricity required to liberate 1 gram equivalent of an element is at

A. 1 ampere

B. 96500 amperes

C. 96500 coulombs

D. 96500 faradays

Answer: C

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82. If m represents mass of substance (equivalent weight E) consumed or produced when quantity Q of electricity is passed

A. $m \propto Q$

B. $m \propto 1/Q$

C. $m \propto 1/E$

D. $m \propto Q.E$

Answer: D

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83. Which of the following reactions will take place at the cathode during the electrolysis of an aqueous solution of sodium chloride ?

A. $Na^{+} + e^{-} \rightarrow Na$

B. $Cl^{-} - e^{-} \rightarrow Cl$

C. $2H^{+} + 2e^{-} \rightarrow H_2$

D. $2H^{-} - 2e^{-} \rightarrow H_2$

Answer: C

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84. State Faraday's first law of electrolysis.

A. for the same electrolyte, the mass of a substance produced or consumed at an electrode directly proportional to the quantity of electricity passed through the electrolyte cells.

B. For the same electrolyte , the mass of a substance produced or consumed at an electricity passed through the electrolytic cell.

C. When same quantity of electricity is passed through different electrolytes, the amounts of products obtained are proportional to their equivalent weights.

D. When same quantity of electricity is passed through obtained are proportional to their molecular masses.

Answer: A

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85. For reducing 1 mole of ferrous ions to iron the number of faradays of electricity required will be

A. 1

B. 2

C. 3

D. 1.5

Answer: B

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86. The amount of electric charge on one mole of electrons is _________.

A. ampere

B. coulomb

C. faraday

D. unit charge

Answer: C

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87. Quantity of electricity is measured in

A. amp^{-1} sec

B. amp $\sec^{-1}$

C. amp. Sec.

D. amp.

Answer: C

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88. To obtain 2.70 g of silver (at. Mass 108) from an aqueous solution of $AgNO_3$ it is required to pass

A. 2412.5 coulomb

B. 24125 coulombs

C. 95500 coulombs

D. 48250 coulombs

Answer: A

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89. On passing one Faraday of electricity from an aqueous solution $NiSO_4$ (Atomic weight of Ni=58.71 , S=32 , O=16) weight of Ni deposited on the cathode is

A. 29.355 g

B. 58.71 g

C. 0.2935 g

D. 0.5871 g

Answer: A

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90. On passing one faraday of electricity though molten lead (II) bromide , amount of bromine obtained is

A. 1 gm equivalent

B. 1 gm mole

C. 1 mole

D. 1 mole gm atom

Answer: A

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91. Electrochemical equivalent is the mass of the element liberated during electrolysis when

A. 1 amp. Current is passed.

B. 1 coulamb electricity is passed

C. 1 faraday electricity is passed

D. 1 amp current for 1 hour is passed

Answer: B

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92. An amperes is a rate of flow of electric current of

A. one faraday per second

B. one coulomb per second

C. one coulomb per minutes

D. one faraday per minutes

Answer: B

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93. A current of c amperes was passed through a solution of an electrolyte for t seconds when Q grams of element was deposited on an electrode . If Z be constant.

A. Q=ctz

B. Q=ct/z

C. Q=cz/t

D. Q=tz/c

Answer: A

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94. On passing C ampere of electricity through an electrolyte solution for l secodns, m gram metal deposits on cathode. The eq. wt. of metal is

A. $E = \dfrac{c \times t}{Q \times 96500}$

B. $E = \dfrac{c \times t96500}{Q}$

C. $E = \dfrac{c \times Q96500}{t}$

D. $E = \dfrac{96500Q}{c \times t}$

Answer: D

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95. When the same electric current is passed through the solution of different electrolytes in series, the amounts of elements deposited on the electrodes are in the ratio of their

A. atomic numbers

B. atomic weights

C. specific gravities

D. equivalent weights

Answer: D

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96. The same electric current is passed through solutions of ferrous sulphates , $FeSO_4$ and silver nitrate, $AgNO_3$. If the amount of iron deposited is (Ag=108, Fe=56, N=14, S=32, O=16)

A. 14 g

B. 2.7 g

C. 0.7 g

D. 1.35 g

Answer: C

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97. An electric current when passed through dilute sulphuric acid for 2 hours liberated 0.50 g of hydrogen . What weight of copper will be liberated if the same current is passed for one hour through copper sulphate solution ?

A. 7.94 g

B. 15.97 g

C. 31.75 g

D. 63.50 g

Answer: A

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98. Electric current is passed through two cells A and B series. Cell A contains aq. $AqNO_3$ and platnium electrodes while cell B contains sq. $CuSO_S$ and copper electrodes.

A. The cathode and anode reactions occuring in the two cells are different

B. The cathode reactions in the two cells are identical but the anode reactions are different

C. The cathode reactions in the two cells are different but the anode reactions are identical

D. Electrolysis occurs only in cell A and in cell B

Answer: A

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99. An electric current passed through aqueous solution of the following which one shall decompose ?

A. Urea

B. Glucose

C. Silver nitrate

D. Ethyl alcohol

Answer: C

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100. The unit of electrochemical equivalent is

A. kilogram/volt

B. coulomb/gram

C. gram/ampere

D. gram/coulomb

Answer: D

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101. How much charge is required for the reduction of 1 mole of Cu^{2+} to Cu.

A. $1.23 \times 10^{5}C$

B. 1.63×10^{5} C

C. $1.93 \times 10^{5}C$

D. $2.12 \times 10^5 C$

Answer: C

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102. How many coulombs are required for the oxidation of $1 mol$ of H_2O to O_2?

A. $1.63 \times 10^5 C$

B. $1.93 \times 10^5 C$

C. $1.99 \times 10^5 C$

D. $2.13 \times 10^5 C$

Answer: B

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103. 1.1081 gram of copper displaces 3.67 grams of silver from a solution of $AgNo_3$. The equivalent weight Ag is 107.88 . What is the equivalent weight of copper ?

A. 21.38

B. 28.78

C. 32.57

D. 38.38

Answer: C

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104. The theory of electrolytic dissociation was given by

A. Dalton

B. Faraday

C. Ostwald

D. Arrhenius

Answer: D

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105. One faraday of electricity will liberate one gram mole of the metal from the solution of

A. auric chloride

B. silver nitrate

C. calcium chloride

D. copper sulphate

Answer: B

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106. On passing electric current in to a solution of salt of metal, M the reaction at cathode takes place as :

$M^{2+} + 2e^{-} \rightarrow M$. The atomic weight of M is 65. What is the equivalent weifht of the metal ?

A. 260

B. 130

C. 65

D. 32.5

Answer: D

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107. A chemist wants to produce $Cl_2(g)$ from molten NaCl. How many grams could be produced if the uses a steady current of 1 amp for 5.0 minutes ?

A. 3.55 g

B. 1.775g

C. 0.177 g

D. 0.110 g

Answer: D

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108. How much quantity of electricity is required to liberated 1 g equivalent weight of an element ?

A. 96,500 Faradays

B. 96,500 Coulombs

C. 96,500 amperes

D. 96,500 gram

Answer: B

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109. When a current of one ampere flows through a conductor for one second, the quantity of electricity passed is called

A. One Coubomb

B. One Faraday

C. One ohm

D. Electrochemical equivalent

Answer: A

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110. $22.4dm^3$ of hydrogen at S.T.P. weights :

A. 1×10^{-3} kg

B. 2×10^{-3} kg

C. 2×10^3 kg

D. 1×10^3 kg

Answer: B

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111. Out of the following which is Correct ?

A. 1 Joule =1 Watt $\times$ 1 Coulomb

B. 1 Joule =1 volt $\times$ 1 Coulomb

C. 1 Volt =1 Joule $\times$ 1 Coulomb

D. 1 Coulomb = 1 watt $\times$ 1 Joule

Answer: B

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112. What is the equivalent mass of a metal having electrochemical equivalent of 3.4×10^{-7} kg ?

A. $32.81 \times 10^{-2} kg$

B. 3.281×10^{-2} kg

C. $3281 \times 10^{2} kg$

D. 328.1×10^{-2} kg

Answer: B

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113. How many Coulombs are required to produce 54 grams of aluminium from molten Al_2O_3 ? (Eq. wt of Al=9)

A. 68,390 C

B. 3,89,340 C

C. 5,79,000 C

D. 7,29,000 C

Answer: C

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114. How many coulombs are required for the reduction of 1 mol of MnO_4^- to Mn^{2+}?

A. 96,500 Coulomb

B. 4,28,500 Coulomb

C. 48,200 Coulomb

D. 48,000 Coulomb

Answer: B

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115. If the current of 0.5 A passes for 40 min through solution of $AgNO_3$ the quantity is :

A. 1,200 gm

B. 1,200 Coulomb

C. 12 Coulomb

D. 200 Coulombs

Answer: B

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116. 65,500 columb = ______

A. 6.28×10^{18} electrons

B. 6.023×10^{23} electrons

C. 6.023×10^{23} electrons

D. 6.28×10^{27} electrons

Answer: C

View Text Solution

117. On Faraday liberates how much gram molecular volume of hydrogen gas ?

A. $11.2 dm^3$

B. $22.4 dm^3$

C. $11.2 cm^3$

D. $22.400 dm^3$

Answer: A

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118. On passing $0.1F$ of electricity through aluminimum chloride, the amount of aluminimu metal deposited on cathode is $(A1 = 27)$.

A. 0.9 gm

B. 0.09 gm

C. 2.7 gm

D. 0.27 gm

Answer: B

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119. A certain quantity of electricity is passed through an aqueous solution of $AgNO_3$ and cupric salt solution connected in series. The amount of Ag deposited is 10.8 gm . The amount copper deposited is : (At. Wt. of Cu=63.5 and Ag=108)

A. 6.35 gm

B. 3.175 gm

C. 0.3175 gm

D. 0.03175 gm

Answer: B

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120. What weight of copper will be deposited by passing 2 faradays of electricity through a cupric salt (atomic weight of $Cu = 63.5)$?

A. 63.5 gm

B. 31.75 gm

C. 127.0 gm

D. 6.35 gm

Answer: A

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121. On passing an electric current, the quantity of a metal deposited on cathode depends upon

A. shape of cathode

B. size of cathode

C. concentration of electrolyte

D. quantity of charge and charge number on metal ion

Answer: D

View Text Solution

122. 1 C of charge is carried by how many number of electrons ? (N_A is Avogadros number)

A. N_A

B. $F \times N_A$

C. $\frac{N_A}{F}$

D. $\frac{F}{N_A}$

Answer: C

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123. If current of one ampere is passed fro one second, then the mass deposited at the electrode is equal to

A. one gram atomic

B. one gram molecular

C. one gram equivalent

D. one gram electro chemical equivalent

Answer: D

View Text Solution

124. When 1300 coulomb of electricity passed through $CuSO_4$ solution the amount of Cu deposited is

A. 4.28×10^{-4} kg

B. $5929g$

C. 6.35×10^{-4}

D. $96500g$

Answer: A

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125. On passing 9.65 amperes of electricity for 1000 seconds, 2.0 grams of metal deposits . The molar of metal is

A. 40

B. 20

C. 2

D. 10

Answer: B

View Text Solution

126. Four Faraday of electricity is passed through solution of Ferrous sulphate . The mass of iron (At. Wt. 56) deposited at cathode in terms of grams is

A. 56

B. 84

C. 112

D. 224

Answer: C

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127. How many coulombs are required to produce 100 grams of calcium from molten $CaCl_2$? (at . Weights of Ca=40)

A. $96500C$

B. $2.5 \times 96500C$

C. $5 \times 96500C$

D. $96500 / 5C$

Answer: C

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128. On passing 96,500 coulombs of electricity which of the following metal slat solutions will liberate one gram atom of metal ?

A. $AlCl_3$

B. $SrCl_2$

C. $CdSO_4$

D. KCl

Answer: D

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129. How many moles each of Ag^+ ion Cu^{2+} ion and Fe^{3+} ions would be deposited by passeage of same quantity of electricty through solutions of their salts ?

A. same number of mole each

B. $1:1/2:1/3$

C. $1/3:1/2:1$ mole

D. $1:2:3$

Answer: B

View Text Solution

130. Three faradays of electricity are passed through molten Al_2O_3 aqueous solution of $CuSO_4$ and molten $NaCl$ taken in deffernt electrolytic cells. The amout of Al, Cu and Na deposited at the cathodes will be in the ration of .

A. $1:2:3$

B. $1:5:2$

C. $1:15:3$

D. $1:3:2$

Answer: C

Watch Video Solution

131. A silver cup is plasted with silver by passing 0.001 F of electricity . The amount of Ag deposited is (Ag = 107.8)

A. 0.1078 gm

B. 1.08 gm

C. 9.89 gm

D. 107.8 gm

Answer: A

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132. A current of strength $2.5A$ was passed through $CuSO_4$ solution for 6 minute 265 seconds. The amount of copper deposited is (At. Of $Cu = 63.5, 1F = 96500C$).

A. 6.35 gm

B. 0.3175 g

C. 0.635 g

D. 3.175 g

Answer: B

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133. 20.0 g of chlorine are evolved in 6 hours from sodium chloride by the current of

A. 5 amp

B. 10 amp

C. 2.5 amp

D. 50 amp

Answer: C

View Text Solution

134. On passing certain charge through molten alminium chloride produced 18 gm of Al at cathode . The volume of chloride produced at N.T.P. at anode is

A. $11.2 dm^3$

B. $22.4 dm^3$

C. $5.6 dm^3$

D. $33.6 dm^3$

Answer: B

View Text Solution

135. How many coulomb are required to liberate $1.12 m^3$ of hydrogen at S.T.P. during electrolysis?

A. 965

B. 96500

C. 9650000

D. 96.5

Answer: C

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136. The number of Faradays needed to reduce 4 gm. Equivalents of Cu^{2+} to Cu metal will be

A. 1

B. 2

C. $\frac{1}{2}$

D. 4

Answer: D

View Text Solution

137. 2.5 faradays of electricity is passed through solution of $CuSO_4$. The number of gram equivalents of copper depsoited on the cathode would be

A. 1

B. 2

C. 2.5

D. 1.25

Answer: C

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138. The amount of copper in moles deposited by the passage of 96,500 coulombs of electricity through copper sulphate solution is

A. 2

B. 1.5

C. 0.5

D. 1

Answer: C

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139. An electrolytic cell contains a solution of $AgNO_3$ and Pt electrodes. A current is passed until 1.6 gm of O_2 has been liberated at anode. The amount of Ag deposited has liberated at cathode would be

A. 1.6 g

B. 0.8 g

C. 21.6 g

D. 10.788 g

Answer: C

View Text Solution

140. How many coloumbs are required for the oxidation of 1 mole of $H_2O\text{to}O_2$

A. $9.65 \times 10^4 C$

B. $4.825 \times 10^5 C$

C. $1.93 \times 10^5 C$

D. $1.93 \times 10^6 C$

Answer: C

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141. A current of $0.75A$ is passed through an acidic solution of $CuSO_4$ for 10 minutes. The vlume of oxygen liberated at anode (at STP) will be.

A. $0.243dm^3$

B. $0.243m^3$

C. 0.243 cm^3

D. 24.3 mL

Answer: D

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142. The weight of silver (at $wt. = 108)$ displaced by a quantity of electricity which displaced $5600mL$ of O_2 at STP will be:

A. 5.4 gm

B. 10.8 gm

C. 54 gm

D. 108 gm

Answer: C

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143. The number of atoms of Cr discharged from $CrCl_3$ solution by passage of 1.5 faraday would be

A. 6×10^{23}

B. 3×10^{23}

C. 2×10^{20}

D. 6×10^{10}

Answer: B

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144. In electrolysis of water under alkaline conditions a total of 1 mole of gases is evolved . The amount of water decomposed would be

A. 2 mol

B. 1 mol

C. 2/3 mol

D. 1/3 mol

Answer: C

View Text Solution

145. At STP 1.12 litre of H_2 is obtained on flowing current for 965 seconds in a solution . The value of current is

A. 10 Amp.

B. 1.0 Amp.

C. 1.5 Amp.

D. 2.0 Amp.

Answer: A

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146. The time required to coat a metal surface of $80cm^2$ with $5 \times 10^{-3}cm$ thick layer of silver (density $1.05gcm^{-3}$) with the passage of $3A$ current through a silver nitrate solution is:

A. 115 sec

B. 125 sec.

C. 135 sec.

D. 145 sec.

Answer: B

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147. In the electrolysis of H_2SO_4 , 0.2 gram of hydrogen is produced, hence the weight of another substance produce is

A. 1.6 gram

B. 3.2 gram

C. 6.1 gram

D. 19.2 gram

Answer: A

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148. The charge required for the reduction of $1 mol$ $Cr_2O_7^{2-}$ ions to Cr^{3+} is

A. $3 \times 96500C$

B. $4 \times 96500C$

C. $6 \times 96500C$

D. $6 \times 96500F$

Answer: C

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149. 2 F of electricity will liberate 1 gram atom of the metal from the solution of

A. NaCl

B. KCl

C. $BaCl_2$

D. $AlCl_3$

Answer: C

View Text Solution

150. Units of Faradays are

A. ampere

B. C

C. C/mol

D. C/sec

Answer: C

View Text Solution

151. The volume of H_2 liberated at 273K and 4 atm pressure by the passage of 1 faraday of electricity through HCl solution is

A. $4.48dm^3$

B. $5.6dm^3$

C. $2.8dm^3$

D. $112dm^3$

Answer: C

View Text Solution

152. The no. of coulombs required to liberate $0.224dm^3$ of chlorine at $0^\circ C$ and 1 atm passed are :

A. 2×965

B. 96500

C. 96.5

D. 965/2

Answer: A

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153. Which of the following statement is correct ?

(A) joule is the unit of work

(B) Faraday is the unit of electric current

(C) Watt is the work performed at the rate of 1 joule per second

(D) Volt = Ohm $\times$ ampere

A. only A,B and C

B. only A and C

C. only A, C and D

D. all of above

Answer: C

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154. A cell in which electric current is produced by redox process is called _______ cell.

A. standard cell

B. reversible cell

C. voltaic cell

D. concentration cell

Answer: C

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155. A galvanic cell consists of

A. cadmium cell

B. two half cells

C. three half cells

D. lead accumulator

Answer: B

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156. In galvanic cell

A. oxidation occurs at anode

B. reduction occurs at cathode

C. chemical energy is converted into electrical energy

D. all of these

Answer: D

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157. A voltaic cell stops working after some time, because the electrode potential of both the electrodes

A. increases

B. decreases

C. become equal

D. connected by salt bridge

Answer: C

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158. For preparing a salt bridge, gelatin or agar-agar is dissolved in a hot aqueous solution of

A. K_2CO_3

B. K_2SO_4

C. NH_4NO_3

D. $(NH_4)_3PO_4$

Answer: C

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159. If a salt bridge is removed between the half cells, the voltage

A. drops to zero

B. does not change

C. increases rapidly

D. increases gradually

Answer: A

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160. Which of the following is false about redox reactions in a cell ?

A. electrical energy is generated

B. reactions is not completed

C. oxidation and reduction can take place in different containers

D. redox reaction donot take place simltaneously

Answer: D

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161. Which of the following statement is NOT CORRECT with respect to a voltaic cell ?

A. Anode is negatively charged

B. Cathode is positively charged

C. Reduction takes place at the cathode

D. Reduction takes place at the anode

Answer: D

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162. A device used to convert chemical energy into electrical energy is called _____

A. Electrolytic cell

B. Voltaic cell

C. Coulometer

D. Voltmeter

Answer: B

View Text Solution

163. In voltaic cells, the electrons lost during the oxidation flow from

A. cathode to anode

B. anode to cathode

C. remains as it is in the electrolytic solution

D. electrons flow from electrolytic solution to electrodes

Answer: B

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164. Daniel cell is

A. irreversible voltaic cell

B. reversible voltaic cell

C. reversible secondary cell

D. irreversible secondary cell

Answer: B

View Text Solution

165. Which of the followig statements is correct for galvanic cell written in an abbreviated from ?

A. left electrode is cathode

B. right electode is anode

C. left electrode is positive terminal

D. right electrode is positive terminal

Answer: D

View Text Solution

166. The incorrect statement is

A. Salt bridge connects two halfs cells

B. Salt beidge maintains electrical neutrality

C. Salt bridge minimises liquid junction potential

D. Salt bridge increases the emf of the cell

Answer: D

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167. Which of the following is true in the case of $Zn - CuSO_4$ cell ?

A. The flow of electrons take plave from copper to zinc

B. E^0_{red} of copper electrode is less than that of zinc electrode

C. Zinc acts as anode and copper as anode

D. E^0_{ox} of zinc electrode is less than that of copper electrode

Answer: C

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168. Which of the following is incorrect ?

A. Zinc acts as anode in Daniel cell

B. In a Li-Zn couple, zinc acts as cathode

C. Iron will displace copper in solution

D. Tin displaces zinc in solution

Answer: D

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169. The emf of the Daniel cell using molar concentrations of $ZnSO_4$ and $CuSO_4$ solutions is

A. 1.0 V

B. 0.1 V

C. 2.0 V

D. 1.1V

Answer: D

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170. During the working of the Daniel cell , which of the following happen ?

A. the size of the Zn rod as well as the intensity of the colour of $CuSO_4$ solution remain unchanged

B. the size of the Zn rod is reduced and the blue colour of $CuSO_4$ solution become faint

C. the size of the Zn rod remains same but the blue colour of $CuSO_4$ solution become faint

D. the size of the Zn rod is reduced but there is no change in the intensity of colour of the $CuSO_4$ solution

Answer: B

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171. Cell reaction for the cell

$Zn|Zn^{2+}(1.0M)||Cd^{2+}(1.0M)|Cd$ is given by

A. $Cd \to Cd^{2-} - 2e^-$

B. $Zn^{2-} \to Zn - 2e^-$

C. $Cd \to Cd^{2+} + 2e^-$

D. $Zn + Cd^{2+} \rightarrow Zn^{2+} + Cd$

Answer: D

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172. The most important condition for a galvanic cell is

A. The electrolysis should not have physical contact

B. The electrolytes should be taken in a separate containeer

C. The electrodes should be inert

D. The two half cells should be connected internally by some devices

Answer: D

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173. Salt bridge is used because it

A. maintains the electrical neutrality of the two half cells

B. It enhances the flow of electrons by overcoming liquid jnction potential

C. It provides the lost ions

D. It forms insoluble precipitates with the electrolytes in the two half cells

Answer: A

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174. It is impossible to measure the actual voltage of any half cel by itself because

A. both half cell reactions occur simultaneously .

B. electrical neutrality is maintained

C. of resistance of wire

D. a reaction does not take place of its own

Answer: D

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175. In the cell reaction

$$Ag_{(s)} + Cu(aq))^{2+} + Br^{-}_{(aq)} \rightarrow AgBr_{(s)} + Cu_{(s)}$$

the reduction half reaction is

A. $Ag_{(s)} \rightarrow Ag^{+} + e^{-}$

B. $Cu^{2+} + 2e^{-} \rightarrow Cu$

C. $Cu \rightarrow Cu^{2+} + 2e^{-}$

D. $Ag_{(s)} + Br^{-}_{(aq)} \rightarrow AgBr_{(s)} + e^{-}$

Answer: B

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176. Cell reaction for the cell

$Zn|Zn^{2+}(1.0M)||Cd^{2+}(1.0M)|Cd$ is given by

A. $Cd \rightarrow Cd^{2-} + 2e^{-}$

B. $Zn^{2+} \rightarrow Zn - 2e^{-}$

C. $Cd + Zn^{2+} \rightarrow Zn + Cd^{2+}$

D. $Zn + Cd^{2+} \rightarrow Zn^{2+} + Cd$

Answer: D

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177. $Ag/AgCl_{(s)}, Cl^{-}_{(aq)}\ Ag_{(s)} + Cl^{-} \Leftrightarrow ? + e^{-}$

A. AgCl

B. $AgCl_{s}$

C. $2AgCl_{s}$

D. $AgCl_{aq}$

Answer: B

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178. $Pb/PbSO_4 - ((s)), SO_{4(aq)}^{-2}$

$Pb_{(s)} + SO_4^{-2} \Leftrightarrow PbSO_{4(s)} + ?$

A. e^-

B. $3e^-$

C. $2e^-$

D. no electron

Answer: C

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179. $1/2H_{2(g)} \rightarrow H^+ + ?$ (oxidation)

A. e^-

B. $2e^-$

C. $3e^-$

D. no electron

Answer: A

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180. $Pt, O_2(1atm.)OH^- \_((aq))$

$2OH^-_{(aq)} \Leftrightarrow H_2O_{(l)} + ? + 2e^-$

A. $1/2O_2$

B. $1/2O_{2(g)}$

C. $O_{2(g)}$

D. $2O_{2(g)}$

Answer: B

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181. The electrode with higher reduction potential is written at

A. ectreme left

B. extreme right

C. in the middle

D. any where

Answer: B

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182. In the cell $Cu|Cu^{2+}|\,|\,Ag^{+}|Ag$ Which is not applicable ?

A. Ag electrode is negative electrode

B. Cu electrode is negatively electrode

C. Ag^{+} is reduced to Ag

D. Cu is oxidised to Cu^{2+}

Answer: A

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183. Which of the following is used in voltaic cell to represent a contract between electrode and electrolyte ?

A. horizontal line

B. dotted vertical line

C. double vertical

D. single vertical line

Answer: D

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184. The main difference between conventional electro-chemical cell and fuel cell is the materials undergoing oxidation at the anode or reduction at the cathode in fuel cell

A. are not stored

B. are stored inside the cell

C. are stored outside the cell

D. reactions at anode and cathode

Answer: C

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185. The metal platinum in SHE is

A. inert metal

B. electron collector

C. non metal

D. inert electrode

Answer: D

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186. Which of the following are examples of redox electrodes ?

A. $Pt \mid Sn^{2+}_{(aq)}, Sn^{4+}_{(aq)}$

B. $PtCl_{2(g)} \mid Cl^{-}_{(aq)}$

C. $Ag \mid AgCl_{(s)}, KCl_{(aq)}$

D. $Cu_{(s)} \mid CuSO_{4(aq)}$

Answer: A

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187. Which of the following are examples of sparingly soluble salt electrodes ?

A. $OH^{-}_{(aq)} \mid O_{2(g)}, Pt$

B. $Cl^{-}_{(aq)} \mid Hg_2Cl_{2(s)}, Pt$

C. $Cd^{2+}_{(aq)} \mid Cd_{(s)}$

D. $SO^{2-}_{4(aq)}, Ag_2SO_{4(s)} \mid Ag_{(s)}$

Answer: D

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188. The calomel electrode can be represented as

A. $KCl_{(aq)} | Hg_2Cl_{2(s)} | Hg_{(s)}, Pt$

B. $KCl_{(aq)} | Hg_2Cl_{2(s)} | H_{2(l)}, Pt$

C. $KCl_{(aq)} | Hg_2Cl_{2(s)} | Hg_{(l)}, Pt$

D. $Hg_2Cl_{2(l)} | KCl_{(aq)} | Hg_{(l)}, Pt$

Answer: C

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189. Calomel electrode is reversible to

A. Hg^{+2} ions

B. Hg

C. Hg_2Cl_2

D. Cl^{-} ions

Answer: D

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190. In a cell of NHE (Normal Standard hydrogen electrode) and calomel electrode, the reaction taking place at calomel electrode wil be

A. $Hg_2Cl_2 + 2e^- \rightarrow 2Hg + 2Cl^-$

B. $Hg_2Cl_{2(s)} \rightarrow 2Hg_{(l)} + 2Cl^- + 2e^-$

C. $Hg_2Cl_{2(s)} + 2Hg_{(l)} \rightarrow 2Cl^- + 2e^-$

D. $2Hg_{(l)} + 2Cl^- \rightarrow Hg_2Cl_2 + 2e^-$

Answer: A

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191. Nernst equation is given by

A. $E_{\text{ox}} = E^0_{\text{ox}} - \frac{0.059}{n} \log_{10} \frac{[\text{oxidised state}]}{[\text{Reduced state}]}$

B. $E_{\text{ox}} = E^0_{\text{ox}} + \frac{0.059}{n} \log_{10} \frac{[\text{oxidised state}]}{[\text{Reduced state}]}$

C. $E_{\text{ox}} = E^0_{\text{ox}} - \frac{0.059}{n} \log_{e} \frac{[\text{oxidised state}]}{[\text{Reduced state}]}$

D. $E_{\text{ox}} = E^0_{\text{ox}} + \frac{0.059}{n} \log_{e} \frac{[\text{oxidised state}]}{[\text{Reduced state}]}$

Answer: A

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192. The standard hydrogen electrode is written in

A. $Pt, H_2 \mid H^+(1M)$

B. $Pt, H_2 H^+(a/M)$

C. $Pt, H_2(1atm) \mid H^+(1M)$

D. $Pt/H_2, H^+$

Answer: C

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193. Write Nernst equation for the electrode reaction :

$M^{n+}(aq) + \text{ne}^-(aq) \rightarrow M(s)$

A. $E = E^\circ + RT/n[M^+]$

B. $E = E^\circ + \frac{RT}{nF}\log[M^{n+}]$

C. $E = E^\circ + \frac{RT}{nF}\log\frac{[M_{(s)}]}{[M^{n+}(aq)]}$

D. $E = E^{\circ} + \frac{RT}{nF} \ln \frac{1}{[M^{n+}]}$

Answer: B

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194. A cell is represented by the equation

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

The voltage of the cell will increase with the increase in

A. size of the copper rod

B. size of the silver rod

C. concentration of Ag^{+} ions

D. concentration of Cu^{2+} ions

Answer: C

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195. For the reaction $Zn(s) + Cu^{2+} \rightarrow Zn^{2+}(aq) + Cu(s)$, Nernest eqaution at $25^{\circ} C$ is

A. $E = E^{\circ} + \frac{0.059}{2} \log \frac{\left[Zn^{2+}_{(aq)}\right]}{\left[Cu^{2+}_{(aq)}\right]}$

B. $E = E^{\circ} + \frac{0.059}{2} \log \frac{\left[Zn^{2+}_{(aq)}\right]}{\left[Zn^{2+}_{(aq)}\right]}$

C. $E = E^{\circ} + \frac{0.059}{2} \log \frac{\left[Cu^{2+}_{(aq)}\right]}{\left[Zn^{2+}_{(aq)}\right]}$

D. $E = E^{\circ} + \frac{0.059}{2} \log \frac{\left[Cu^{2+}_{(aq)}\right]}{\left[Cu^{2+}_{(aq)}\right]}$

Answer: C

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196. The oxidation potential is the tendency of an electrode to

A. inactive electrode

B. get reduced

C. gain electrons

D. loss electrons

Answer: D

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197. The electrode whose potential is arbitrarily fixed is called

A. indicator electrode

B. pH electrode

C. reference electrode

D. silver electrode

Answer: C

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198. The electrode whose potential depends upon the concentration of a particular ion present in its surronding solution is called

A. reference electrode

B. indicator electrode

C. hydrogen electrode

D. calomel electrode

Answer: B

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199. Which of the following is placed above the pure mercury in calomel electrode ?

A. Hg+KCl

B. Hg+NaCl

C. $Hg + Hg_2Cl_2$

D. $Hg + MgCl_2$

Answer: C

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200. The potential of calomel electrode depends upon the concentration of

A. KCl solution

B. $HgCl_2$ solution

C. Hg_2Cl_2

D. Hg only

Answer: A

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201. The electrode consists of a metal I contact with its sparingly soluble salt and an electrolyte containing a common ion called as

A. metal-metal electrode

B. metal-metal ion electrode

C. metal-metalloid electrode

D. metal-insoluble salt(of metal) electrode

Answer: D

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202. Standard cell electrode potential is expressed as

A. $E^0_{cell} = E^0_{red(R.H.S.)} - E^0_{\text{Oxi}(L.H.S)}$

B. $E^0_{cell} = E^0_{red(L.H.S.)} + E^0_{\text{Oxi}(R.H.S)}$

C. $E^0_{\text{cell}} = E^0_{\text{oxi(Anode)}} + E^0_{\text{Oxi(Cathode)}}$

D. $E^0_{cell} = E^0_{red(R.H.S.)} + E^0_{\text{Oxi}(L.H.S)}$

Answer: D

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203. According to Nernst theory , potential developed at an electrode is due to :

A. Electronation only

B. De-electronation only

C. Electronation and de-electronation

D. Combustion

Answer: C

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204. The reduction potential to calomel decreases with

A. decrease in concentration of KCl

B. increase in concentration of KCl

C. no effect of concentration of KCl

D. atmospheric pressure

Answer: B

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205. In Nernst equation the constant 0.0591 represents the value of

A. $\frac{2.303RT}{nF}$

B. 2.303 $\frac{RT}{F}$

C. $\frac{RT}{nF}$

D. $\frac{2.303RT}{nF}\log Q^0$

Answer: B

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206. Calomel electrode is an example of

A. indicator electrode

B. primary reference electrode

C. secondary reference electrode

D. gas electrode

Answer: C

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207. Single electrode potential is

A. The potential developed at any electrode of a cell at all times.

B. The potential difference between an electrode and the solution around it only at 298 K.

C. The potential developed at the electrode when reactants and products are of unit activity.

D. The potential difference between an electrode and the solution around it , is at equilibrium

Answer: D

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208. When no reaction takes place at an electrode then such an electrode having zero potential is called ______electrode .

A. reference

B. standard

C. indicator

D. null

Answer: D

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209. A metal rod dipped into a solution containing its own ions at unit activity at 298 K is called

A. single electrode

B. half cell

C. metal couple

D. standard electrode

Answer: D

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210. In a voltaic cell, ar 298K if activity of both electrolyte is unify then according to Nernst's equation

A. $E = E^0$

B. $E > E^0$

C. $E < E^0$

D. $E \neq E^0$

Answer: A

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211. The reduction potential of NCE at 298 K is

A. 0.3338 V

B. 0.2415 V

C. 0.28 V

D. 0.76 V

Answer: C

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212. For the cell $Zn|Zn^{+2}||Cu^{+2}|Cu$, if the concentration of Zn^{+2} and Cu^{+2} ions is doubled, the emf of the cell

A. doubles

B. reduces to half

C. remains same

D. becomes zero

Answer: C

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213. A standard hydrogen electrode has zero electrode potential because :

A. hydrogen is easier to oxidize

B. this electrode potential is assumed to be zero

C. hydrogen atom has only one electron

D. hydrogen is the highest element

Answer: B

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214. What is the use of platinum foil in an SHE ?

A. increases its surface area for adsorption

B. is a good conductor

C. maintain better electrical contact

D. prevents the electrode from damage

Answer: A

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215. The EMF of the cell cannot be measured accurately by a voltmeter because

A. voltmeter is very sensitive

B. concentration changes during measurement

C. the voltmeter damages the cell

D. the voltmeter changes the cell reaction

Answer: B

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216. What is potential of half cell containing zinc electrode in 0.01 M $ZnSO_4$? ($E^0 = -0.763V$)

A. $+0.763V$

B. $-0.763V$

C. $-0.822V$

D. $-0.70V$

Answer: C

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217. Adding powdered Pb and Fe to a solution containing 1.0 M each of Pb^{2+} and Fe^{2+} ions would result into the formation of:

A. more Fe and Pb^{2+} are formed

B. more Pb & Fe^{2+} are formed

C. concentration of both Pb^{2+} and Fe^{2+} increases

D. no net change

Answer: B

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218. The reduction potential is the tendency of an eleCtrode to

A. solution pressure

B. get oxidized

C. lose electrons

D. accept electrons

Answer: D

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219. The difference of potential between the electrode and its salt solution at equilibrium is called

A. standard electrode potential

B. redox potential

C. single electrode potential

D. complete cell potential

Answer: C

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220. The standard reduction potentials at $25^{\circ}C$ for the following half reactions are given against each:

$Zn^{2+}(a.q) + 2e^{-} \Leftrightarrow Zn(s): \qquad -0.762$

$Cr^{3+}(a.q)3e^{-} \Leftrightarrow Cr(s), \qquad -0.740$

$2H^{+} + 2e^{-} \Leftrightarrow H_2(g), \qquad 0.00$

$Fe^{3+} + e^{-} \Leftrightarrow Fe^{2+}, \qquad 0.77$

Which is the strongest reducing agent?

A. $Cr_{(s)}$

B. $Fe^{2+}_{(aq)}$

C. $Zn_{(s)}$

D. $H_{2(g)}$

Answer: C

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221. The standard potential of an electrode is its potential when the concentration of the salt solution is

A. 1N at 298 K

B. 1 M at 298 K

C. 1 M at 273 K

D. 1 N at 125 K

Answer: B

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222. If standard electrode potenial of Cu^{2+}/Cu is $0.34V$ then potential of Cu dipped in 0.1 M solution of $CuSO_4$ will be

A. 0.34 V

B. $-0.34V$

C. 0.31 V

D. $-0.31V$

Answer: C

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223. The emf for the cell $Ni|Ni^{2+}(1.0M)||Au^{3+}(1.0M)|Au\left(E^{\circ}f \text{ or } N\frac{i^{2+}}{N}i = -0.25V, E^{\circ}\right.$ for is

A. $-0.25+1.50=1.25V$

B. $-0.25-(+1.50) = -1.75V)$

C. $1.50-(-(0.25)=1.75V$

D. $1.50(X3)+(-0.25)X2=4.0V$

Answer: C

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224. The cell potential of the galvanic cell

$Zn|Zn^{++}|Ag^{+}|Ag$,

$E^{\circ}\left(Zn^{++} \mid Zn\right) = -0.76V, E^{\circ}\left(Ag^{+}|Ag\right) = +0.80V$

A. $+ve$

B. $-ve$

C. zero

D. can't say

Answer: A

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225. The e.m.f of the cell does not depend upon

A. temperature

B. nature of electrode

C. concentration of ions in solution

D. anion in metal-metal ion electrode

Answer: D

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226. The standard reduction potential of Pb and Zn electrodes are -0.12 6 and -0.763 volts respectively . The e.m.f of the cell

$Zn\left|Zn^{2+}+(0.1M)\right| \mid Pb^{2+}(1M)Pb$ is

A. 0.637 V

B. $-0.637V$

C. $-0.889V$

D. 0.889 V

Answer: D

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227. The e.m.f of a cell involving the cell reaction

$H_2 + 2Ag^+ \rightarrow 2H^+ + 2Ag$ is 0.80 V. The standard reduction potential of $Ag^+ | Ag$ electron is

A. 0.20 V

B. 0.40 V

C. 0.60 V

D. 0.80 V

Answer: D

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228. The cell potential for the cell

$Ni | Ni^{2+}(1M) || Cu^{2+}(1M) | Cu$ is 0.59 V and

$E(Cu^{2+} \mid Cu) = +0.34V$. What is the standard electrode potential of $Ni^{2+} \mid Ni$ electrode?

A. $-0.25V$

B. $+0.25V$

C. $+9.93V$

D. $-0.93V$

Answer: A

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229. When zinc electrode and calomel electrode are coupled to form a cell , the cell emf is given as

A. $E^0_{cell} = E_{Zn(\text{ox})} - E^0_{\text{Calomel}(\text{red})}$

B. $E^0_{cell} = E^0_{\text{Calomel}(\text{red})} - E^0_{Zn(\text{ox})}$

C. $E^0_{cell} = E^0_{\text{Calomel}(\text{red})} - E^0_{Zn(\text{ox})}$

D. $E^0_{cell} = E_{Zn\,(\text{ox})} - E^0_{\text{Calomel}\,(\text{ox})}$

Answer: D

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230. The half cell reactions of the cell used in hearing aids are

$Zn \rightarrow Zn^{2+} + 2e^- \left(E^0 = +0.76V\right)$

$Ag_2O + H_2O + 2e^- \rightarrow 2Ag + 2OH^- \left(E^0 = +0.34V\right)$

E^0 of the cell is

A. 0.84 V

B. 0.42 V

C. 1.1 V

D. 2.2 V

Answer: C

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231. Given that $E^{\circ}(Zn) = -0.76V$ and $E^{\circ}(Cu) = 0.34V$. Calculate the emf of the cell with cell reaction

A. $-42V$

B. $1.42V$

C. $-1.10V$

D. $+1.10V$

Answer: D

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232. Which of the following netals wil be deposited first when a solution containing 0.1 mol/litre of each of $AgNO_3$, $Ca(NO_3)_2$, and $Mg(NO_3)_2$ is electrolysed by using inert electrodes ?

It is given that

$E^{\circ}_{(Ag)} = +0.80V, E^{\circ}_{(Cu)} = 0.34V, E^{\circ}_{(Ni)} = -0.25V \text{and} E^{\circ}_{(Mg)} = -2.$

.

A. Ag

B. Cu

C. Ni

D. Mg

Answer: A

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233. The SRP values of three elements A , B and C are +2.37V, -1.85V and -1.36V respectively. So the order of their reducing power will be

A. $A > B > C$

B. $C > B > A$

C. $A > C > B$

D. $B > C > A$

Answer: D

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234. Four elements A, B ,C and D have standard oxidation potential values as : 2.87V , +2.71V, 1.67V and -2.87V. The strongest reducing agent will be

A. A

B. B

C. C

D. D

Answer: A

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235. गैल्वेनी सेल में कौन -सी धातु घुलेगी ?

$Cu|Cu^{2+}|\,|\,Ag^{+}|Ag$

A. Cu

B. Ag

C. both Ag and Cu

D. Cannot predict

Answer: A

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236. Will tin displace lead from an aqueous solution of lead bromide ?

A. Yes, because SRP value of $Sn < Pb$

B. Yes, because SRP value of $Pb < Sn$

C. No, because E° cell comes out to be negative

D. Experimental fact, so cannot be predict

Answer: A

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237. Is the reaction, $2Al + 3Fe^{2+} \Leftrightarrow 2Al^{3+} + 2Fe$ possible ?

A. may displace

B. yes, because S.O.P. value of $Al > Fe$

C. experimental fact

D. no, because S.O.P value $Fe > Al$

Answer: B

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238. More electropositive have more

A. negative reduction potential

B. negative oxidation potential

C. positive reduction potential

D. tendency to gain electrons

Answer: A

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239. Copper metal dissolves in an aqueous solution of silver nitrate, imparting it a blue colour. This is because

A. Cu is oxidized to Cu^{+} ions

B. Cu is oxidized to Cu^{2+} ions

C. Ag is displaced iron solution

D. Ag-ions are oxidized to Ag

Answer: B

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240. The standard reduction potential of $Li^{\oplus}|Li, Ba^{2+}|Ba, Na^{\oplus} \mid Na$ and $Mg^{2+}|Mg$ are $-3.05, \ -2.71, \ -2.71$, and -2.37 volts, respectvely.

Which one of the following is the strongest oxidizing agent ?

A. Na^{+}

B. Li^{+}

C. Ba^{2+}

D. Mg^{2+}

Answer: D

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241. Which of the following metal cannot liberate hydrogen from the acid ?

A. copper

B. zinc

C. magnesium

D. nickel

Answer: A

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242. To an aqueous solution containing I^- and Br^- ions , I_2 and Br_2 are added . The products of the reaction would be

A. Br_2, I^-

B. I_2, Br_2

C. I_2, Br^-

D. I^-, Br^-

Answer: C

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243. E° for $Fe^{2+} + 2e^- \rightarrow oFe$ is -0.4 volts and E° for $Zn^{2+} + 2e^- \rightarrow Zn$ is -0.76 volts . Its means that

A. Fe is more electropositive

B. Zn is more electropositive

C. Zn is more electronegative

D. Fe is more electronegative

Answer: B

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244. The reaction is spontaneous if the cell potenital is .

A. positive

B. negative

C. zero

D. infinite

Answer: A

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245. Prevention of corrosion of iron by Zn coating is called

A. galvanisation

B. cathodic protection electrolysis

C. electrolysis

D. photoelectrolysis

Answer: A

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246. The standard oxidation potentials of the elements M_1, M_2 and M_3 are +0.34V , +3.05 V and +1.66V respectively. The order of their reducing strength wil be

A. $M_1 > M_3 > M_2$

B. $M_1 > M_2 > M_3$

C. $M_2 > M_3 > M_1$

D. $M_3 > M_2 > M_1$

Answer: C

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247. Standard reduction potential values for the electrodes are given below.

$Mg^{2+}2e^- \rightarrow Mg \text{ is } -2.37V$

$Zn^{2+} + 2e^- \rightarrow Zn \text{ is } -0.76V$

$Fe^{2+} + 2e^- \rightarrow Fe \text{ is } -0.44V$

Which of the following statement is correct

A. zinc will reduce Mg^{+2}

B. Zn will reduce Fe^{+2}

C. Mg oxidises Fe

D. Zn oxidises Fe

Answer: B

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248. The standard reduction potential of silver, chlorine , gold and copper are +0.80V , +1.36V , +1.42V , +0.34V respectively. The strongest oxidising agent will be

A. silver

B. chlorine

C. gold

D. copper

Answer: C

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249. The values of std. oxidation electrode potentials of the following reactions are given as :

(i) $Fe \rightarrow Fe^{++} + 2e^{-}\ E^{0} = 0.441V$

(ii) $Pb \rightarrow Pb^{++} + 2e^{-}\ E^{0} = 0.126V$

(iii) $Cu \rightarrow Cu^{++} + 2e^{-}\ E^{0} = -0.337V$

(iv) $Ag \rightarrow Ag^{+} + e^{-}\ E^{0} = -0.799V$

Which of the following is reduced very easily ?

A. Fe^{2+}

B. Pb^{2+}

C. Cu^{2-}

D. Ag^{+}

Answer: D

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250. Four colourless salt solutions are placed in separate test tubes and a strip of copper is dipped in each. Which solution finally turns blue ?

A. $Zn(NO_3)_2$

B. $Cd(NO_3)_2$

C. $NaNO_3$

D. $AgNO_3$

Answer: D

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251. In emf series, elements are arranged in the

A. decreasing order of SOP

B. increasing order of SRP

C. decreasing order of SRP

D. random way

Answer: C

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252. Can spontaneous reactions occur between Zn^{2+} and Au atoms ? (E^0_{ox} values for zinc and gold are +0.76V and -1.42 V resp.)

A. yes, $E^0_{cell} = 2.18V$

B. no, $E^0_{cell} = -2.18V$

C. yes, $E_{cell^0} = 0.66V$

D. no, $E^0_{cell} = -0.66V$

Answer: D

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253. Standard zinc electrode is coupled with a standard electrode to form a cell, whise emf was found to be 1.60V , reduction taking place at Zinc electrode . If standard reduction potential of zinc electrode is -0.76V, then the standard reduction potential of the standard electrode will be_____ V.

A. -2.36

B. $+0.84$

C. 2.36

D. -0.84

Answer: A

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254. A,B,C,and D are four elements whose standard oxidation potentials are +2.82V , +2.71V ,+1.67V and -2.87V. The strongest reducing agent is

A. A

B. B

C. C

D. D

Answer: A

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255. Arrange the following metals in the increasing order of reducing power:

Li,Zn,Sn,Fe,Cu,Ag.

$E^0_{Li} = -3.045V$, $E^0_{Zn} = -0.762V$,

$E^0_{Sn} = -0.140V$, $E^0_{Fe} = -0.441V$,

$E^0_{Cu} = +0.337V$, $E^0_{Ag} = +0.779V$,

A. $Ag < Cu < Fe < Sn < Zn < Li$

B. $Li < Zn < Fe < Sn < Fe < Zn < Li$

C. $Ag < Cu < Sn < Fe < Zn < Li$

D. $Li < Zn < Fe < Sn < Cu < Ag$

Answer: C

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256. In the cell , $Pt, Sn^{+4} \mid \left|Fe^{+3}\right| Fe^{+2}, Pt,$ the cathode half cell reaction is

A. $Fe^{+3} + e^{-} \rightarrow Fe^{+2}$

B. $Fe^{+3} 3e^{-} \rightarrow Fe$

C. $Fe^{+2} + 2e^{-} \rightarrow Fe$

D. $Fe^{+2} \rightarrow Fe^{+3} + e$

Answer: A

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257. Which metal does not give the following reaction $M +$ water or steam $\rightarrow$ oxide $+ H \downarrow$

A. Iron

B. Sodium

C. Magnesium

D. Mercury

Answer: D

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258. Zinc is used to protect corrosion of iron because

A. $E^{0}_{(\text{oxd})}$ of Zn $< E^{0}_{\text{oxd}}$ of iron

B. $E^{0}_{(red)}$ of Zn $< E^{0}_{(red)}$ of iron

C. Zn is cheaper than iron

D. Zn is abundantly available

Answer: B

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259. Which of the following pairs of metal cannot be obtained by electrolysis of an aqueous solution of its salt ?

A. Ag and Al

B. Mg and Al

C. Ag and Mg

D. Cu and Cr

Answer: B

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260. On the electrolysis for aqueous solution of sodium sulphate , on cathode we get

A. SO_2

B. Na

C. SO_3

D. H_2

Answer: D

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261. Which one of the following reaction is not possible ?

A. $Fe + H_2SO_4 \rightarrow FeSO_4 + H_2$

B. $CuO + H_2 \rightarrow Cu + H_2O$

C. $2KBr + I_2 \rightarrow 2Kl + Br_2$

D. $Cu + 2AgNO_3 \rightarrow Cu(NO_3)_2 + Ag$

Answer: C

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262. During charging of a lead storage battery, the following reaction occurs at the cathode

A. $Pb - 2e^{-} \rightarrow Pb^{2+}$

B. $Pb^{2+} + 2e^{-} \rightarrow Pb$

C. $Pb^{2-} + SO_4^{2-} \rightarrow PbSO_4$

D. $PbSO_4 + 2H_2O \rightarrow 2PbO_2 + 4H^{+} + SO_4^{2-} + 2e^{-}$

Answer: B

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263. A voltaic cell can be changed into an electrolytic cell by

A. providing higher potential from outside

B. changing the electrolytes in two half cells

C. reversing the electrodes

D. changing the conc. Of the electrolytes

Answer: A

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264. The compound commonly used as electrolyte in lead storage batteries is :

A. $CuSO_4$

B. H_2SO_4

C. Distilled water

D. $PbSO_4$

Answer: B

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265. During discharge in the case of lead storage batteries density of sulphuric acid

A. increases

B. decreases

C. remains unchanged

D. may decrease or increase

Answer: B

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266. In the storage battery during charging

A. pH of the electrolyte increases

B. pH decreases

C. pH remains unchanged

D. pH may increase or decrease depends on the extent of changing

Answer: B

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267. The electrode reactions for charging of a lead battery are

$$PbSO_4 + 2e^- \rightarrow SO_4^{2-} + Pb$$

$$PbSO_4 + 2H_2O \rightarrow PbO_2 + SO_4^{2-} + 4H^+ + 2e^-$$

The electrolyte in the battery is an aqueous solution of sulphuric acid after the battery has been charged.

A. The sulphuric acid will be more concentrated

B. The sulphuric acid will be less concentrated

C. The concentration of sulphuric acid will be unchanged

D. Sulphuric acid will have been completely decomposed

Answer: A

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268. Which of the following is a secondary cell?

A. Daniel cell

B. Nickel cadmium storage cell

C. Mercury cell

D. Fuel cell

Answer: B

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269. When lead storage battery discharges

A. $PbSO_4$ is consumed

B. SO_2 is formed

C. H_2SO_4 is consumed

D. Pb is formed

Answer: C

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270. If an external opposing E.M.F. is slightly greater than E.M.F. of Daniel cell the reaction will

A. be reversed

B. remain same

C. move in the forward direction

D. all are right

Answer: A

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271. In case of Daniel cell $Zn/Zn^{2+}//Cu^{2+}/Cu$ which of the followings is NOT true ?

A. Zinc acts as an anode

B. Electrons move from Zn to Cu

C. Copper acts as cathode

D. Zinc acts as cathode

Answer: D

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272. In Daniel cell zinc displaces copper from $CuSO^4$ solution since it has

A. lower oxidation potential

B. higher oxidation potential

C. equivalent oxidation potential

D. higher reduction potential

Answer: B

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273. When an aqueous solution of H_2SO_4 is electrolysed, the ion discharged at anode is

A. hydroxyl

B. sulphate

C. oxygen

D. hydrogen

Answer: A

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274. Lead accumulator is a secondary storage cell because

A. it is an irreversible cell

B. electrical energy is previously stored in it from an external source

C. electrolysis occurs in it

D. it involves H_2SO_4 solution

Answer: B

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275. Lead accumulator cell consists of

A. $20\% \ H_2SO_4$ solution

B. $3.2M H_2SO_4$ solution

C. H_2SO_4 of sp. Gravity 1.15

D. dilute solution of H_2SO_4

Answer: B

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276. Dissociation of H_2SO_4 takes place during

A. charging of cell

B. discharging of cell

C. decomposition of cell

D. maintainance of the lead accumulator

Answer: B

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277. The specific gravity of H_2SO_4 after complete discharging becomes

A. 1.17

B. 1.1215

C. 0.115

D. 0.1215

Answer: A

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278. During charging of lead accumulator

A. electrolysis of $PbSO_4$ takes place and Pb and PbO_2 are deposited

B. Pb and PbO_2 are deposited

C. specific gravity of H_2SO_4 remains same

D. specific gravity of H_2SO_4 decreases

Answer: A

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279. The voltage of Pb-accumulator cell depends on

A. size of cell

B. size of cell and concentration of H_2SO_4

C. only on concentration of H_2SO_4

D. size of cell or concentration of H_2SO_4

Answer: C

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280. Lead accumulator cell can be maintained in good working condition when

A. the cell is allowed to run upto 1.7 V

B. the cell is not allowed to run upto 1.17 V

C. the cell is not completely removed from the cell

D. the cell is not disconnected when not in use

Answer: B

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281. During discharging of Lead storage cell, the reaction taking place at cathode is represented by :

A. $Pb \rightarrow Pb^{+2} + 2e^{-}$

B. $Pb + SO_4^{-2} \rightarrow PbSO_4 + 2e^{-}$

C. $PbO_2 + 4H^{+} + SO_4^{--} + 2e^{-} \rightarrow PbSO_4 + 2H_2O$

D. $Pb + PbO_2 + 2H^{+} + 2SO_4^{--} + 2e^{-} \rightarrow 2PbSO_4 + H_2O$

Answer: C

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282. The lead accumulator is

A. primary , reversible voltaic cell

B. secondary , reversible voltaic cell

C. primary , irreversible voltaic cell

D. secondary, irreversible cell

Answer: B

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283. In lead accumulator the electrolyte used is

A. $10\ \%\ H_2SO_4$ with specific gravity 2.15

B. $38\% H_2SO_4$ with specific gravity 1.28

C. 10% H_2SO_4 with specific gravity 2.215

D. 38% H_2SO_4 with specific gravity 2.15

Answer: B

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284. During recharging of car-battery, the battery acts as

A. Electrolytic cell

B. Voltaic cell

C. dry cell

D. concentration cell

Answer: A

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285. The anode is a dry cell is

A. graphite rod

B. copper rod

C. zinc container

D. carbon lead plates

Answer: C

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286. In dry cell cathode is

A. zinc rod

B. graphite rod

C. copper rod

D. lead grids

Answer: B

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287. In a dry cell , zinc container is protected from the atmosphere by covering it with

A. a metal cap

B. paste of NH_4Cl and $ZnCl_2$

C. cardboard

D. metal cap

Answer: C

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288. The dry cell do not have a long life because

A. overall cell reaction do not involve any ions

B. the zinc container is covered with cardboard

C. acidic NH_4Cl corrodes the Zn container even when the cell is not in use

D. NH_3 formed is not liberated as gas

Answer: C

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289. The cell that was used as the primary source of electrical energy on the appolo moon flights is

A. Voltaic cell

B. Mercury cell

C. Hydrogen-oxygen fuel cell

D. Lead storage battery

Answer: C

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290. Electrical cell that converts energy from the combusion of fuels directly into electrical energy is called

A. photo cell

B. fuel cell

C. Daniel cell

D. battery

Answer: B

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291. The hydrogen/oxygen fuel cell keeps on working so long as

A. the concentration of electrolyte in reduction half cell reduces to zero

B. the concentration of electrolyte in oxidation half cell reduces to zero

C. the concentration of electrolyte in reduction half cell is equal to the concentration of electrolyte in oxidation half cell

D. the supply of reactants continues

Answer: D

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292. In $H_2 - O_2$ fuel cell, at cathode the reduction takes place of the specie, which is

A. O^{-}

B. O_2^{-}

C. H_2O

D. O_2

Answer: D

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293. In $H_2 - O_2$ fuel cell the electrodes are made of

A. graphite

B. porous graphite

C. carbon

D. all these

Answer: B

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294. When rusting starts,

A. Fe^{2+} ions pass into solution at cathodic area

B. H^{+} ions reduced to H_2gas at anodic area

C. Oxygen in presence of H^{+} ions reduces to water at cathodic area

D. Oxygen in presence of H^{+} ions reduces to water at anodic area

Answer: C

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295. Chemically , rust of iron is

A. Fe_3O_4

B. $FeO. xH_2O$

C. $Fe_2O_3. xH_2O$

D. $Fe_3O_4 . xH_2O$

Answer: C

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296. In corrosion of Fe, anode is

A. Fe in contact with water

B. Fe contact with air

C. that where Fe^{2+} is converted to Fe^{3+}

D. that where H_2O is converted to $O_2$3

Answer: A

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297. During rusting , Fe is

A. reduced

B. oxidised

C. hydrated

D. decomposed

Answer: B

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298. Galvanisation of iron denotes coating with _____

A. Cu

B. Sn

C. Al

D. Zn

Answer: D

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299. Rusting of iron is not only on the surface but it eats up iron completely because

A. rust penetrates into iron

B. rust further reacts with Fe-atoms in the bulks

C. water and air penetrate into iron

D. rust is a non-sticking compound

Answer: D

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300. The electrolyte playing role in corrosion of iron is

A. CO_2

B. H_2O

C. H^+

D. H_2CO_3

Answer: D

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301. Some statement(s) is/are given below.

I. Rust is hydrated ferric oxide

II. Saline water slows down rusting

III. Pure metals undergo corrosion faster than impure metals

IV. Fe does not undergo corrosion when placed in vacuum

Among the above

A. A,B and C are true

B. A and C are false

C. A and D are true

D. B and D are false

Answer: C

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302. Which of the following reactions depict the oxidising behaviour of H_2SO_4?

A. $2PCl_5 + H_2SO_4 \rightarrow 2POCl_3 + 2HCl + SO_2Cl_2$

B. $2NaOH + H_2SO_4 \rightarrow Na_2SO_4 + 2H_2O$

C. $NaCl + H_2SO_4 \rightarrow NaHSO_4 + HCl$

D. $2HI + H_2SO_4 \rightarrow I_2 + SO_2 + 2H_2O$

Answer: D

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303. Kohlrausch's law is used to calculate

A. $\wedge_m^{\infty}$

B. λ^0 c area

C. both

D. $\lambda^0 m C_6H_{12}O_6$

Answer: A

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304. $\wedge_m^\infty$ is more for

A. 0.1 M NaCl

B. 0.001 M NaCl

C. 0.01 Potash alum

D. 0.01 M KCl

Answer: C

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305. How many faraday are required to liberate 8 g of hydrogen ?

A. 2

B. 4

C. 8

D. 18

Answer: C

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306. When 96500 coulombs of electricity are passed through barium chloride solution, the amount of barium deposited will be

A. 0.5 mol.

B. 1.0 mol.

C. 2.0 mol.

D. 4.0 mol.

Answer: A

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307. When electricity is passed through H_2SO_4 and $CaCl_2$ solution, the ratio of hydrogen and calcium liberated by weight will be(atomic mass of Ca = 40)

A. $1:10$

B. $1:40$

C. $1:20$

D. $1:30$

Answer: C

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308. How many coulombs of electricity will be required to deposit 0.6354g of Cu in electrolytic cell containing copper sulphate solution ? (Atomic weight of copper 63.54)

A. 96.5 coulomb

B. 96.5 coulombs

C. 1930 coulombs

D. 3860 coulombs

Answer: C

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309. How long will a current of 1 ampere take for complete deposition of copper from 1 litre of $1NCuSO_4.5H_2O$ solution ?

A. 2×26500 seconds

B. 96500 seconds

C. $96500 / 4$ seconds

D. 9650 seconds

Answer: B

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310. The magnitude of charge on an electron is $1.603 \times 10^{-19} C$. The value of the faraday constant, F, is

A. 56530 coulombs

B. 69430 coulombs

C. 83240 coulombs

D. 96430 coulombs

Answer: D

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311. How much electric charge is required to produce 20.0 g of calcium from molten $CaCl_2$?

A. 96500 C

B. $2 \times 9600C$

C. $3 \times 96500C$

D. $96500/3C$

Answer: A

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312. How many electrons per second pass through a cross-section od a copper wire carrying $10^{-5}A$?

(charge of 1 electron is 1.0×10^{-19} coulomb).

A. 1.6×10^{-36}

B. $1 \times 10^{+14}$

C. 6250

D. 62500

Answer: B

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313. 1 mole of electrons is passed through three electrolytic cells in series , first containing silver ions , the second zinc ions and third ferric ions , assming that the only cathodic reaction in each cell reduces the ions to the metal , the number of moles of each metal deposited will be :

A. Ag(0.3 mol.),Zn(1 mol.),Fe(1mol.)

B. Ag(0.5mol.),Zn(0.33 mol.),Fe(1mol.)

C. Ag(1mol.),Zn(0.5mol.),Fe(0.35mol.)

D. Ag(0.5mol.),Zn(1mol.),Fe(0.33 mol.)

Answer: C

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314. When a current of one ampere passes through a circuit for one second , how much quantity of silver is deposited ?

A. $1.123 \times 10^{-6} kg$

B. 1.123 kg

C. $1.123 \times 10^{-4} kg$

D. $1.123 \times 10^{-3} kg$

Answer: A

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315. Two electrolytic cells, one containing acidified ferrous sulphate and another acidified ferric chloride, are in series. The ratio of masses of Iron deposited at the cathode in the two cells will be

A. $2:1$

B. $2:3$

C. $1:1$

D. $3:2$

Answer: D

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316. The cost of electricity required to deposit $1gMg$ is Rs. 5.00. the cost of $30g$ of Al to be deposited is Rs. X. Find the value of $\frac{x}{40}$?

A. Rs 10.00

B. Rs 27.00

C. Rs 44.44

D. Rs66.67

Answer: D

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317. The emf of the following three galvanic cells :

1. $Zn/Zn^{2+}(1M) \mid \mid Cu^{2+}(1M)/Cu$

2. $Zn/ZN^{2+}(1M) \mid \mid Cu^{2+}/cu$3. Zn//Zn^(2+) (1 M) || Cu^(2+) (0.1 M)

Cu$arerepersentedby$E_1, E_2, E_3` which of the following statement is true ?

A. $E_2 > E_1 > E_3$

B. $E_3 > E_2 > E_1$

C. $E_1 > E_2 > E_3$

D. $E_3 > E_1 > E_2$

Answer: A

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318. The reaction

$$\frac{1}{2}H_2(g) + AgCl(s) \Leftrightarrow H^+(aq) + Cl^-(aq) + Ag(s)$$

occurs in the galvanic cell

A. $Ag|AgCl(s)||KCl(so\ln.), AgNO_3(so\ln.)|Ag$

B. $Pt|H_2(g)||HCl(so\ln.)AgCl(s)|Ag$

C. $Pt|H_2(g)||HCl(so\ln.)AgCl(s)|Ag$

D. $Pt|H_2, HCl||KCl(so\ln.)AgCl(s)|Ag$

Answer: D

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319. The oxidation potential of a hydrogne electrode at $pH = 10$ and $p_{H_2} = 1atm$ is

A. 0.51V

B. 0.00 V

C. 0.59 V

D. 0.059 V

Answer: C

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320. Among the following the oxidation potential is maximum is case of :

A. SCE

B. SHE

C. NCE

D. DCE

Answer: B

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321. A cell involves the reaction

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

The EMF of cell will invrease by

A. increase in concentration of Ag^+ ions

B. decrease in concentration of Ag^+ ions

C. increase in concentration of Sn^{2+} ions

D. increase in size of Ag electrode

Answer: A

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322. The standard oxidation potential E° for the half cell reactions are

$Zn \rightarrow Zn^{2+} + 2e^- : E^\circ = +0.76V$

$Fe \rightarrow Fe^{2+} + 2e^- E^\circ = +0.41V$

EMF of the cell reaction

$Fe^{2+} + Zn \rightarrow Zn^{2+} + Fe$ will be

A. $-0.35V$

B. $+0.35V$

C. $+1.17V$

D. $-1.17V$

Answer: B

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323. The blue colour is obtained when a copper wire is immersed in $AgNO_3$ solution, it is due to formation of

A. Ag^{+} ions

B. Cu^{+} ions

C. Cu^{2+} ions

D. a soluble complex

Answer: C

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324. Given that $E^{\circ}(Zn) = -0.76V$ and $E^{\circ}\left(Mg \mid Mg^{2+}\right) = 2.37V$.

What will happen when zinc dust is added to $MgCl_2$ solution ?

A. Magnesium will be precipitated

B. Zinc will dissolve forming a soluble complex

C. Zinc chloride will be formed

D. No reaction will occur

Answer: D

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325. Which of the following metals when coupled will give maximum e.m.f. for a voltaic cell ?

A. Fe and Cu

B. Ca and Cu

C. Cu and Au

D. Pb and Au

Answer: B

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326. Following reactions occur spontaneously as written below:

$2Fe^{+++} + 2l^{-} \rightarrow 4Fe^{++} + I_2$

$O_2(g) + H^{+} + 4Fe^{++} \rightarrow 4Fe^{+++} + 2H_2O$

Oxidizing power of O_2, Fe^{+++} and I_2 will be in the order:

A. $O_2 > Fe^{3+} > I_2$

B. $O_2 > I_2 > Fe^{3+}$

C. $I_2 > O_2 > Fe^{3+}$

D. $I_2 > Fe^{3+} > O_2$

Answer: A

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327. A solution containing one mole per litre of each $Cu(NO_3)_2$, $AgNO_3$, $Hg_2(NO_3)_2$ is being electrolysed by using inert electrodes. The values of standard electrode potentials in volts (reduction potentials) are

$Ag^+/Ag = +0.80V, HG_2^{2+}/Hg = +0.79V$

$Cu^+/Cu = +0.34V, Mg^{2+}/Mg = -2.37V$

With increasing valtage, the sequence of deposition of metals on the cathode will be

A. Ag,Cu,Hg,Mg

B. Hg,Cu,Hg,Ag

C. Ag,Hg,Cu,Mg

D. Cu,Hg,Ag,Mg

Answer: A

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328. Copper sulphate is not stored in aluminium container because

A. copper gets reduced

B. copper gets oxidised

C. aluminium gets reduced

D. copper sulphate become deliquescent

Answer: A

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329. Which metal does not give the following reaction $M +$ water or steam $\rightarrow$ oxide $+ H \downarrow$

A. Iron

B. Sodium

C. Magnesium

D. Mercury

Answer: D

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330. $E^0 Cu / Cu^{+2} = +0.34V, E^0 Sn / Sn^{+2} = -0.14V$

$E^0 Zn / Zn^{2+} = -0.76V$. Predict spontaneous reaction.

A. $Zn + CuSO_4 \rightarrow ZnSO_4 + Cu$

$Sn + CuCl_2 \rightarrow SnCl_2 + Cl$

$Zn + 2HCl \rightarrow ZnCl_2 + H_2$

B. $Zn + CuSO_4 \rightarrow ZnSO_4 + Cu$

$Cu + SnCl_2 \rightarrow Sn + CuC_2$

$Zn + 2HCl \rightarrow ZnCl_2 + H_2$

C. $Zn + CuSO_4 \rightarrow ZnSO_4 + H_2$

$Cu + SnCl_2 \rightarrow CuCl_2 + Sn$

$Cu + 2HCl \rightarrow CuCl_2 + H_2$

D. $Zn + CuSO_4 \rightarrow ZnSO_4 + Cu$

$Sn + CuCl_2 \rightarrow SnCl_2 + Cu$

$Cu + 2HCl \rightarrow CuCl_2 + H_2$

Answer: A

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331. Which of the following solutions can be safely stored in a copper vessel ?

A. $AgNO_3$

B. $AuCl_3$

C. $ZnSO_4$

D. $AgCl$

Answer: C

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332. When $0.25 mol I^{-}$ oxidised in IO_3^{-} then what coulomb of electric charge related with the reaction theoretically ?

A. $5.79 \times 10^5 C$

B. $4.82500 \times 10^5 C$

C. $2.895 \times 10^5 C$

D. $1.4475 \times 10^5 C$

Answer: D

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333. For which of the following compound, a graph of molar conductivity and $(\text{molarity})^{\frac{1}{2}}$ is obtained straight line ?

A. CsCl

B. NH_4OH

C. HCOOH

D. CH_3COOH

Answer: A

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334. When does the potential of the electrochemical cell become zero ?

A. E_{ox} and anode and E_{red} of cathode become equal

B. E^0_{red} of anode and E^0_{red} of cathode become equal

C. E_{red} of anode and E_{red} of cathode become equal

D. Concentration of both the half cell become same

Answer: C

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335. Select correct option for the statements given with reference to electrochemical cell (where T=true and F=false)

(i) In external circuit e^{-} flow from cathode to anode

(ii) In solution electricity conducted through ions

(iii) In external circuit electric current flow from anode to cathode

(iv) Anions move from anode to cathode through salt bridge

A. TFTF

B. FTFF

C. FFFT

D. FTTF

Answer: D

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336. Calculate the equilibrium constant for the reaction at 298 K

$Zn(s) + Cu^{2+}(aq) \leftrightarrow Zn^{2+}(aq) + Cu(s)$

Given $E^{\circ}_{Zn^{2+}/Zn} = -0.76V$ and $E^{\circ}_{Cu^{2+}/Cu} = +0.34V$

A. 3.3791

B. 1.9413×10^{37}

C. 4.406×10^{18}

D. 5.15×10^{-38}

Answer: B

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337. If 15 Faraday quantity of electricity is passed through $Al^{3+}_{(l)}$ solution then how many gram of Al metal will be obtained ?

(cell effeciency is 80%)(at wt. Al = 27 gmmol^{-1})

A. 135 gm

B. 121.5 gm

C. 108 gm

D. 94.5 gm

Answer: C

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338. What quantity of electricity is required for complete reduction of all Ag^+ from $1.0 M AgNO_3$ is 250 ml aqueous solution ?

A. 2412.5 C

B. 24125 C

C. 4285 C

D. 25250 C

Answer: B

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339. When aqueous solution of $AgNO_3$ is electrolysed with platinum electrodes its concentration decereases from 4M to 3M . If same solution is electrolysed with Ag electrode then which of the following observation will be observed ?

A. Result wil be same

B. Concentration of solution increases

C. Decrease in concentration will be less

D. No change in the concentration of the solution

Answer: D

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340. Given $E^{\circ}_{Cr_2O_7^{2-} / Cr^{3+}} = 1.33V, E^{\circ}_{MnO_4^- / Mn^{2+}} = 1.51V$

Among the following, the strongest reducing agent is

$E^{\circ}_{Cr^{3+} / Cr} = -0.74V^x, E^{\circ}_{MnO_4^- / Mn^{2+}} = 1.51V$

$E^{\circ}_{Cr_2O_7^{2-}/Cr^{3+}} = 1.33V, E^{\circ}_{Cl/Cl^-} = 1.36V$

Based on the data given above strongest oxidising agent will be

A. Cl^-

B. Cr^{3+}

C. Mn^{2+}

D. MnO_4^-

Answer: C

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341. Relation between standard cell potential and equilibrium constant is

A. $E^{\circ} = \frac{nRT}{F}$ In K

B. $E^{\circ} = \frac{RT}{nF}$ In K

C. $E^{\circ} = \frac{nRF}{T}$ In K

D. $E^{\circ} = \frac{RF}{nT}$ In K

Answer: B

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342. Standard Gibb's free energy change for a cell

$Ni_{(s)} \left| Ni^{++}_{(aq)} \right| \mid Ag^{+}_{(aq)} \left| Ag \right.$

$E^{\circ}_{(cell)} = 1.049V$

A. $-202.5J$

B. 20245 J

C. $-202.5kJ$

D. 2025 kJ

Answer: C

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343. At $25^{\circ} C$ equilibrium constant for the reaction

$Ni_{(s)} + 2Ag^{+}_{(aq)} \rightarrow oNi^{++}_{(aq)} + 2Ag_{(s)}$

is 2×10^{35}, then emf of the cell is

A. 1.247 V

B. 1.043 V

C. 3.559 V

D. 1.430 V

Answer: B

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344. The charge needed to liberate $67.2 dm^{3} of H_{2}$ at STP during electrolysis is

A. $5.97 \times 10^{3} C$

B. $5.79 \times 10^{5} C$

C. $5.59 \times 10^6 C$

D. $5.57 \times 10^8 c$

Answer: B

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345. Conductivity (Unit Siemen's 'S') is directly proportional to area of the vessel and the concentration of the solution in it and is inversely proportionals to the length of the vessel, then the unit of constant of proportionality is :

A. $Sm \quad \text{mol}^{-1}$

B. $Sm^2 mol^{-1}$

C. $S^{-2} m^2 mol$

D. $S^2 m^2 mol^{-2}$

Answer: B

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346. If Θ denotes standard reduction potentical, which is true:

A. $E^{\circ}_{\text{cell}} = \phi_{\text{right}} - \phi_{\text{left}}$

B. $E^{\circ}_{\text{cell}} = \phi_{\text{left}} + \phi_{\text{right}}$

C. $E^{\circ}_{\text{cell}} = \phi_{\text{left}} - \phi_{\text{right}}$

D. $E^{\circ}_{\text{cell}} = -\left(\phi_{\text{right}} + \phi_{\text{right}}\right)$

Answer: A

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347. Serveral blocks of magnesium are fixed to the bottom of a ship to

A. make the ship lighter

B. prevent action of water and salt

C. prevent puncturing by under-sea rocks

D. keep away the sharks

Answer: B

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348. The limiting molar conductivities $\wedge^{\circ}$ for NaCl , KBr , and KCl are 126 , 152 and 150 Scm^2mol^{-1} respectively. The $\wedge^{\circ}$ for NaBr_______.

A. $128Scm^2mol^{-1}$

B. $302Scm^2mol^{-1}$

C. $278Scm^2mol^{-1}$

D. $176Scm^2mol^{-1}$

Answer: A

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349. In a cell that untillizes the reaction ,

$Zn_{(s)} + 2H^{+}_{(aq)} \rightarrow Zn^{2+}_{(aq.)} + H_{2(g)}$, adedition of H_2SO_4 to cathode compartment will :

A. lower the E and shift equilibrium to the left

B. increases the E and shift equilibrium to the left

C. increases the E and shift eqiulibrium to the right

D. lower the E and shift equilibrium to the right

Answer: C

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350. The molar conductivities Λ°_{NaOAc} and Λ°_{HCI} at infinite dilution is watter at $25^{\circ}C$ are 91.0 and $426.2 Scm^{\circ}$ / mol respectively. To calculate Λ^{2}_{HOAc}, the additional value required is:

A. $\wedge^{\circ}_{\text{H\_(2)O}}$

B. $\wedge^{\circ}_{KCl}$

C. $\wedge^{\circ}_{\mathrm{NaOH}}$

D. $\wedge^{\circ}_{\mathrm{NaCl}}$

Answer: D

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351. The cell , $Zn\left|Zn^{2+}(1M)\right| \mid Cu^{2+}(1M)Cu\left(E^{\circ}_{\text{cell}} = 1.10V\right)$,

Was allowed to be completely discharfed at $298K$. The relative concentration of $2+$ to $Cu^{2+}\left[\frac{Zn^{2=}}{Cu^{2+}}\right]$ is :

A. antilog(24.08)

B. 37.3

C. $10^{37.3}$

D. 9.65×10^{4}

Answer: C

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352. Given $E^{\circ}_{Cr^{3+}/cr} = -0.72V, E^{\circ}_{Fe^{2+}/Fe} = -0.42V$. The potential for the cell

$Cr\left|Cr^{3+}(0.1M)\right|\left|FE^{2+}(0.01M)\right|$ Fe is .

A. 0.26 V

B. 0.399 V

C. $-0.399V$

D. $-0.26V$

Answer: A

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353. In a fuel cell methanol is used as fuel and oxygen gas is used as an oxidizer. The reaction is :

$CH_3OH_{(l)} + \frac{3}{2}O_{2(g)} \rightarrow CO_2((g)) + 2H_2O_{(l)}$

At $298K$ standard Gibb's energies of formation for $CH_3OH(l)$, $H_2O(l)$ and $CO_2(g)$ are -166.2, -237.2 and $-394.4 kJmol^{-1}$ respectively. If standard enthalpy of combustion of methanol is $-726 kJmol^{-1}$, efficiency of the fuel cell will be :

A. 80%

B. 87%

C. 90%

D. 97%

Answer: D

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354. The standard reduction potential for Zn^{2+}/Zn, Ni^{2+}/Ni and Fe^{2+}/Fe are -0.76, -0.23 and $-0.44V$ respectively. The reaction $X + Y^{2} \to X^{2+} + Y$ will be spontaneous when:

A. X = Ni, Y=Fe

B. X = Ni , Y = Zn

C. X = Fe , Y = Zn

D. X = Zn , Y = Ni

Answer: D

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355. The standard reduction potentials at $25^{\circ} C$ for the following half reactions are given against each:

$Zn^{2+}(a.q) + 2e^{-} \Leftrightarrow Zn(s): \quad -0.762$

$Cr^{3+}(a.q)3e^{-} \Leftrightarrow Cr(s), \quad -0.740$

$2H^{+} + 2e^{-} \Leftrightarrow H_2(g), \quad 0.00$

$Fe^{3+} + e^{-} \Leftrightarrow Fe^{2+}, \quad 0.77$

Which is the strongest reducing agent?

A. $Zn_{(s)}$

B. $Cr_{(s)}$

C. $H_{2(g)}$

D. $Fe^{2+}_{(aq)}$

Answer: A

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356. The oxidation number of carbon in CH_2O is.

A. -2

B. $+2$

C. 0

D. $+4$

Answer: A

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357. A solution containing one mole per litre of each $Cu(NO_3)_2$, $AgNO_3$, $Hg_2(NO_3)_2$ is being electrolysed by using inert electrodes. The values of standard electrode potentials in volts (reduction potentials) are

$Ag^+ / Ag = +0.80V, HG_2^{2+} / Hg = +0.79V$

$Cu^+ / Cu = +0.34V, Mg^{2+} / Mg = -2.37V$

With increasing valtage, the sequence of deposition of metals on the cathode will be

A. Ag,Hg,Cu,Mg

B. Mg,Cu,Hg,Ag

C. Ag,Hg,Cu

D. Cu,Hg,Ag

Answer: A

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358. A solution of sodium sulphate in qater is electrolysed using inert electrodes, The products at the cathode and anode are respectively.

A. H_2, O_2

B. O_2, H_2

C. O_2, Na

D. O_2, SO_2

Answer: D

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359. The brown ring complex compound is formulated as $\left[Fe(H_2O)_5NO\right]SO_4$. The oxidation state of Fe is

A. 1

B. 2

C. 3

D. 0

Answer: B

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360. The standard reduction potentials of Cu^{2+}/Cu and Cu^{2+}/Cu^{+} are 0.337 V and 0.153V respectively. The standard electrode potential of Cu^{+}/Cu half-cell is

A. 0.184 V

B. 0.827 V

C. 0.521 V

D. 0.490 V

Answer: C

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361. A gas X at 1 atm is bubbled through a solution containing a mixture of 1M Y^- and 1M Z^- at $25^\circ C$. If the reduction potential of $Z > Y > X$, then

A. Y will oxidise X and not Z

B. Y will oxidise Z and not X

C. Y will oxidise both X and Z

D. Y will reduce both X and Z

Answer: A

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362. The oxidation number of sulphur in S_8, S_2F_2 and H_2S respectively are:

A. $0, \ +1 \text{ and } \ -2$

B. $+2, \ +1 \text{ and } \ -2$

C. $0, \ +1 \ \text{and} \ \ +2$

D. $-2, \ +1 \ \text{and} \ \ -2$

Answer: A

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363. Among the following identify the species with an atom in $+6$ oxidation state.

A. MnO_4^-

B. $Cr(CN)_6^{3-}$

C. NiF_6^{2-}

D. CrO_2Cl_2

Answer: D

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364. For the electrochemical cell, $(M) \mid M^{+}) \mid \mid (X^{-} \mid X)$.

$E^{\circ}(M^{+}/M) = 0.44V$ and $E^{\circ}(X/X^{-}) = 0.33V$.

From this data one can deduce that

A. $M + X \rightarrow oM^{+} + X^{-}$ is the spontaneous reaction

B. $M^{+} + X^{-} \rightarrow oM + X$ is the spontaneous reaction

C. $E_{cell} = 0.77V$

D. $E_{cell} = -0.77V$

Answer: B

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365. 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

Answer: C

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366. Standard electrode potential data are useful for understanding the suitability of an oxidant in a redox titration. Some half cell reaction and their standard potentials are given below:

$MnO_4^-(aq) + 8H^+(aq) + 5e^- \rightarrow Mn^{2+}(aq) + 4H_2O(l)E^\circ = 1.51V$

$Cr_2O_7^{2-}(aq) + 14H^+(aq) + 6e^- \rightarrow 2Cr^{3+}(aq) + 7H_2O(l), E^\circ = 1.38V$

$Fe^{3+}(aq) + e^- \rightarrow Fe^{2+}(aq), E^\circ = 0.77V$

$CI_2(g) + 2e^- \rightarrow 2CI^-(aq), E^\circ = 1.40V$

Identify the only correct statement regarding quantitative estimation of aqueous $Fe(NO_3)_2$

A. MnO_4^- can be used in aqueous HCl

B. $Cr_2O_7^{2-}$ can be used in aqueous HCl

C. MnO_4^- can be used in aqueous H_2SO_4

D. $Cr_2O_7^{2-}$ can be used in aqueous H_2SO_4

Answer: A

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367. The half-cell reaction for the corrosion,

$$2H^+ + \frac{1}{2}O_2 + 2e^- \rightarrow H_2O \qquad E_\circ = 123V$$
$$Fe^{2+} + 2e^- \rightarrow Fe(s) \qquad E^\circ = -0.44V$$

Find the $DelyaG^\circ$ (in kJ) for the overall reaction :

A. -76

B. -322

C. -161

D. 152

Answer: B

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368. 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. 9.65×10^4 sec

B. 19.3×10^4 sec

C. 28.95×10^4 sec

D. 38.6×10^4 sec

Answer: B

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369. Which of the following is thecorrect order in which metals displace each other from the salt solution of their salts?

A. Zn,Al,Zn,Fe,Cu

B. Cu,Fe,Mg,Al,Zn

C. Mg,Al,Zn,Fe,Cu

D. Al,Mg,Fe,Cu,Zn

Answer: C

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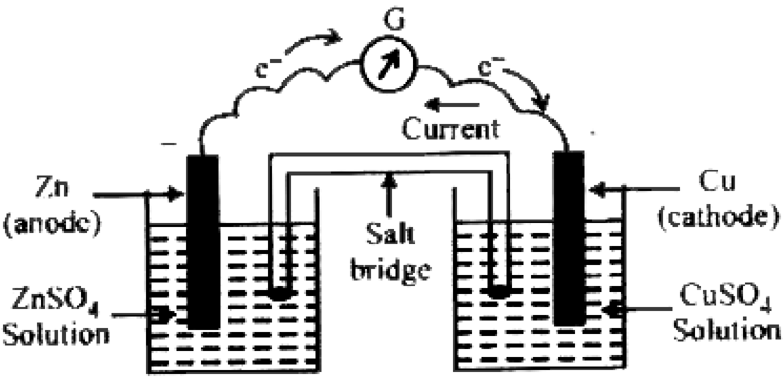
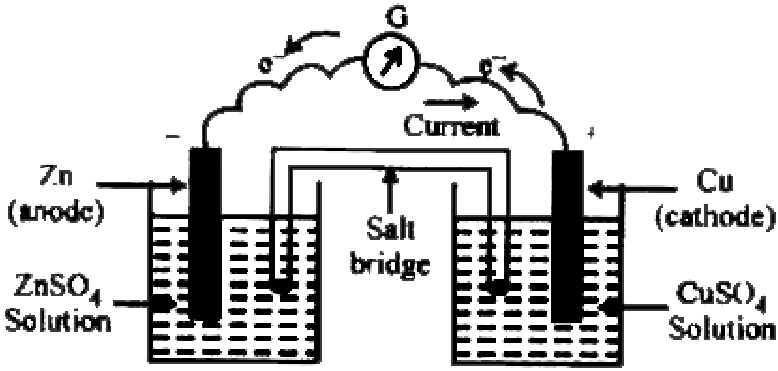
370. Given below are two figures of Daniel cell (P) and (Q) . Study the figures and mark the incorrect statement from the following:



$E_{ext} < 1.1$ V



$E_{ext} > 1.1$ V

A. In fig.(P), elecrons flow from Zn rod to Cu hence current flows from Cu to Zn $(E_{ext} < 1.1V)$

B. In fig.(Q), electrons flow from Cu rod to Zn rod hence current flows from Zn to Cu $(E_{ext} > 1.1V)$

C. In fig.(P), Zn dissolves at anode and Cu deposits at cathode

D. In fig.(Q), Zn is deposited at Cu and Cu is deposited at Zn.

Answer: D

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371. Mark the correct Nernst equation for the given cell.

$F_{(s)}\left|Fe^{2+}(0.001M)\right|\left|H^{+}(1M)\right|H_{2(g)}(1^{-}) \mid Pt_{(s)}$ is

A. $E_{\text{cell}} = E^{\circ}_{\text{cell}} - \dfrac{0.591}{2}\log\dfrac{\left[Fe^{2+}\right]\left[H^{+}\right]^{2}}{[Fe][H_2]}$

B. $E_{\text{cell}} = E^{\circ}_{\text{cell}} - \dfrac{0.591}{2}\log\dfrac{[Fe]\left[H^{+}\right]^{2}}{\left[Fe^{2+}\right][H_2]}$

C. $E_{\text{cell}} = E^{\circ}_{\text{cell}} - \dfrac{0.591}{2}\log\dfrac{\left[Fe^{2+}\right][H_2]}{[Fe]\left[H^{+}\right]^{2}}$

D. $E_{\text{cell}} = E^{\circ}_{\text{cell}} - \dfrac{0.591}{2}\log\dfrac{[Fe][H_2]}{\left[Fe^{2+}\right]\left[H^{+}\right]^{2}}$

Answer: C

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372. Consider ΔG° for the following cell reaction :

$Zn(s) + Ag_2O(s) + H_2O(l) \Leftrightarrow Zn^{2+}(aq) + 2Ag(s) + 2OH^{-}(aq)$

$E^{\circ}_{Ag^{+}/Ag} = +0.80$ and $E^{\circ}_{Zn^{2+}/Zn} = -0.76V$

A. $2.13 \times 10^{5} J\text{mol}^{-1}$

B. $-2.13 \times 10^{5} J\text{mol}^{-1}$

C. $1.06 \times 10^{5} J\text{mol}^{-1}$

D. $-1.06 \times 10^{5} J\text{mol}^{-1}$

Answer: B

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373. An electric charge of 5 Faradays is passed through three electrolytes $AgNO_3$, $CuSO_4$ and $FeCl_3$ solution. The grams of each metal liberted at cathode will be

A. Ag=10.8 g,Cu = 12.7 g, Fe = 1.11 g

B. Ag = 540 g, Cu = 367.5 g , Fe = 325 g

C. Ag =108 g , Cu =63.5 g, Fe = 56g

D. Ag= 540 g, Cu = 158.8 g, Fe = 93.3 g

Answer: D

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374. How much time is required to deposit 1×10^{-3} cm thick layer of silver (density is 1.05 g cm^{-3}) on a surface of area 100 cm^2 by passing a current of 5 A through $AgNO_3$ solution?

A. 125 s

B. 115 s

C. 27.25 s

D. 18.7 s

Answer: D

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375. Fill in the blanks with appropriate words :

The electrolytic solution is always neutral because the total charge on _____ is equal to ____ on ___. Unlike the metallic conductor, the electrolyte conducts the electric current by virtue of movement of its ____. The property due to which a metal tends to go into solution in term of positive ions is known as ______.

(i),(ii),(iii),(iv) and (v) respectively are

A. cations, partial charge ,anions,electrons,reduction

B. cations,total charge,anions,ions,oxidation

C. cations,ionic charge,anions,atoms,dissolution

D. cations,partial charge,anions,molecules,electrolysis

Answer: B

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376. Zn gives H_2 gas with H_2SO_4 and HCl but not with HNO_3 because

A. Zn acts as oxidising agent when reacts with HNO_3

B. HNO_3 is weaker acid than H_2SO_4 and HCl

C. Zn is above the hydrogen in electrochemical series

D. NO_3^- is reduced in preference to H^+ ion

Answer: D

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377. The standard e.m.f. for the cell reaction.

$2Cu^+(aq) \rightarrow Cu(s) + Cu^{2+}(aq)$ is +0.36 V at 298K. The equilibrium constant of the reaction is

A. 1.2×10^6

B. 7.4×10^{12}

C. 2.4×10^6

D. 5.5×10^8

Answer: A

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378. E^(0) values of three metals are listed below .

$$Zn^{2+}_{(aq)} + 2e^- \rightarrow Zn_{(s)}, E^0 = -0.76V$$

$$Fe^{2+}_{(aq)} + 2e^- \rightarrow 2Fe_{(s)}, E^0 = -0.44V$$

$$Sn^{2+}_{(aq)} + 2e^- \rightarrow Sn_{(s)}, E^0 = -0.14V$$

Which of the following statements are correct on the basis of the above information ?

(i) Zinc will be corroded in preference to iron if zinc coating is broken on the surface.

(ii) If iron is coated with tin and the coating is broken on the surface then iron will be corroded.

(iii) Zinc is more reactive than iron but tin is less reactive than iron.

A. (i) and (ii)

B. (ii) and (iii)

C. (i),(ii), and (iii)

D. (i) and (iii)

Answer: C

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379. Which of the following reactions does not take place during rusting ?

A. $H_2CO_3 \Leftrightarrow 2H^+ + CO_3^{2-}$

B. $4Fe^{2+} + O_{2(\text{dry})} \rightarrow Fe_2O_3$

C. $4Fe^{2+} + O_2 + 4H_2O \rightarrow 2Fe_2O_3 + 8H^+$

D. $Fe_2O_3 + xH_2O \rightarrow Fe_2O_3.\,xH_2O$

Answer: B

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380. Electrolysis of an aqueous solution of $AgNO_3$ with silver electrodes produces $\underline{(i)}$ at cathode while $\underline{(ii)}$ ions are dissolved from anode. When Pt electrodes are used $\underline{(iii)}$ is produced at anode and $\underline{(iv)}$ at cathode.

A.

(i)	(ii)	(iii)	(iv)
H_2	NO_3^-	OH^-	H_2

B.

(i)	(ii)	(iii)	(iv)
Ag	H^+	O_2	H_2

C.

(i)	(ii)	(iii)	(iv)
Ag	Ag^+	O_2	Ag

D.

(i)	(ii)	(iii)	(iv)
Ag	H^+	Ag^+	O_2

Answer: C

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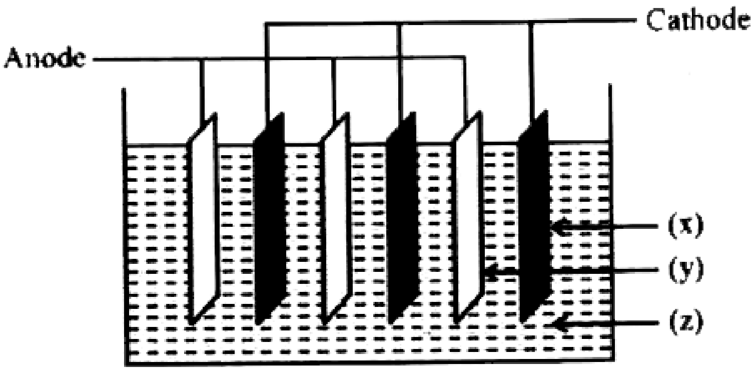
381. Label he given diagram showing lead storage battery:



A. $\begin{array}{lll} x & y & z \\ Pb & PbO_2 & 5MH_2SO_4 \end{array}$

B. $\begin{array}{lll} x & y & z \\ PbO_2 & Pb & \text{Conc.}H_2SO_4 \end{array}$

C. $\begin{array}{lll} x & y & z \\ Pb_3O_4 & PbO_2 & 50\,\%\ H_2SO_4 \end{array}$

D. $\begin{array}{lll} x & y & z \\ PbO_2 & Pb & dil.\ 38\,\%\ H_2SO_4 \end{array}$

Answer: D

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382. Gibb's free energy (ΔG°) for the following reaction is $+422 kJ mol^{-1}$.

$2Cl^{-} + 2H_2O \rightarrow 2OH^{-}_{(aq)} + H_{2(g)} + Cl_{(g)}$

What is the external emf required to carry the reaction ?

A. 2.18 V

B. greater than 2.18 V

C. less than 2.18 V

D. only high voltage

Answer: B

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Previous years Entrance Exams MCQ

1. Specific gravity of sulphuric acid in lead accumulator is

A. 1

B. 1.5

C. 1.28

D. 1.17

Answer: C

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2. $10^{-2} Kg$ of a metal of eq.wt. 1.0×10^{-1} Kg is deposited by passing ______ coulombs.

A. 9650

B. 96500

C. 9000

D. 90000

Answer: A

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3. Standard hydrogen electrode is

A. potential of 1 volt

B. reference electrode

C. indicator electrode

D. all of these

Answer: B

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4. Electrolysis of dilute nitric acid will yeild at cathode

A. NO_2

B. H_2

C. NO_3

D. O_2

Answer: B

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5. Reducing power of A,B,C and D are w,x,y and z respectively such that $z > y > x > z$. The one which will displace all others is

A. A

B. B

C. C

D. D

Answer: A

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6. One gram atom of which of the following compound will require maximum amount of electricity for its decomposition ?

A. $AgNO_3$

B. $MgSO_4$

C. $AlCl_3$

D. $CuCl_2$

Answer: C

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7. If 9650 coulombs of electricity is passed through a copper sulphate solution, the number of moles of copper deposited will be

A. 3.15

B. 2

C. 0.05

D. 0.01

Answer: C

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8. The SOP values of A,B,C and D are $-0.03V, \ +0.1.08V, 0.34V \text{ and } -2.37V$ respectively. The spontaneous cell reaction takes place between

A. A and B

B. B and C

C. D and A

D. B and D

Answer: D

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9. Reduction potentials of A,B,C and D are 0.8 V 0.79 V, 0.34 V and -2.37 V respectively which element displaces all the other three elements

A. A

B. B

C. C

D. D

Answer: D

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10. Na is used in reduction of Zn salt because

A. $E^\circ Zn_{\text{ox}} > E^\circ Na_{\text{ox}}$

B. $E^\circ Zn_{\text{ox}} < E^\circ Na_{\text{ox}}$

C. $E^\circ Zn_{\text{ox}} = E^\circ Na_{\text{ox}}$

D. $E^\circ Zn_{\text{red}} < E^\circ Na_{\text{red}}$

Answer: B

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11. The $E^{\circ}_{(cell)}$ value for $Pt, H_2|H^+||\,Ag^+|Ag$ is $E^{\circ}_{(Ag/Ag^+)} = -0.799V)$

A. 0.0 V

B. 0.399 V

C. $-0.799V$

D. 0.799 V

Answer: D

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12. When 1 F of electricity is passed through acidulated water O_2 evolved is

A. $1dm^3$

B. $11.2dm^3$

C. $5.6dm^3$

D. $22.4dm^3$

Answer: C

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13. Copper sulphate solution does not react with

A. silver

B. zinc

C. iron

D. sodium

Answer: A

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14. In voltaic cell , oxidation occurs on which electrode ?

A. positive electrode

B. negative electrode

C. null electrode

D. reference electrode

Answer: B

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15. Number of Faraday's required to deposit 4 g of H_2 is ________.

A. 5

B. 4

C. 3

D. 2

Answer: B

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16. In electrolysis of dil. H_2SO_4 the ratio by weight of gases evolved at anode and cathode respectively are

A. $1:16$

B. $8:1$

C. $16:1$

D. $3:1$

Answer: B

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17. Cu is dipped in a solution of $AgNO_3$ the colour of solution becomes blue due to

A. oxidation of Cu

B. reduction of Cu

C. oxidation of Ag

D. all of these

Answer: A

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18. Same amount of electricity is passed through solution of ferrous chloride and ferric chloride . Ratio of weight of iron deposited in the two solution is

A. $1:1$

B. $1:2$

C. $2:3$

D. $3:2$

Answer: D

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19. The electrode where de-electronation takes place, acts as

A. anode

B. $-ve$ electrode

C. cathode

D. null electrode

Answer: A

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20. When 0.5 amp of current was passed for 200 seconds, 0.34 gm of copper was deposited , the electrochemical equivalent of copper will be

A. 34

B. 3.4

C. 0.034

D. 0.0034

Answer: D

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21. Oxidizing and reducing property of elements depends upon

A. ionisation potential

B. oxidation potential

C. electron affinity

D. all of these

Answer: D

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22. The e.m.f. of the followig cell,

$Zn \left| \underset{(1M)}{ZnSO_4} \right\| \underset{(1M)}{H^+} \left|_g \underset{1\text{atm}}{H_2} \right| Pt$ is 0.769 volts

The reduction potential of Zn electrode will be

A. zero volt

B. 0.769 V

C. $-0.769V$

D. $7.69V$

Answer: C

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23. In SHE, platinum act as

A. Adsorbate

B. Adsorbent

C. Adsorbate

D. Adsorbent

Answer: B

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24. Reduction of _____ takes place in fuel cell.

A. O_2

B. H_2

C. OH^-

D. O^{2-}

Answer: A

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25. De-electronation in electrochemical cell is called as

A. Anodic oxidation

B. Cathodic oxidation

C. Anodic reduction

D. Cathodic reduction

Answer: A

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26. For reaction $M \rightarrow M^{n+} + \mathrm{ne}^{-}$

A. $E = E^0 + \frac{2.303RT}{nF} \log \frac{[M^{n+}]}{[M]}$

B. $E = E^0 + \frac{2.303RT}{nF} \log \frac{[M]}{[M^{n+}]}$

C. $E = E^0 - \frac{2.303RT}{nF} \log \frac{[M]}{[M^{n+}]}$

D. $E^0 = E + \frac{2.303RT}{nF} \log \frac{[M]}{[M^{n+}]}$

Answer: B

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27. $Mg + Cu^{2+} \rightarrow Mg^{2+} + Cu$, What is E^0_{cell} ?

$E^0_{Mg^{2+}/Mg} = -2.36V, E^0_{Cu^{2+}/Cu} = 0.34V$

A. $2.7V$

B. 2.7 V

C. $-2.02V$

D. $2.02V$

Answer: B

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28. Electrochemical equlivalent weight of Cu is $3.29 \times 10^{-4} g$. Cu is divalent . Calculate its atomic weight.

A. 63

B. 63.5

C. 64

D. 64.5

Answer: B

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29. The number of electrons required to reduce 4.5×10^{-5} g of Al^{+3} is :

A. 3.01×10^{18}

B. 6.02×10^{18}

C. 2.90×10^{18}

D. 3.01×10^{19}

Answer: A

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30. When 10 ampere current is passed for 80 min., volume of H_2 gas liberated is

A. $4.5dm^3$

B. $5.5dm^3$

C. $5.57dm^3$

D. $6.2dm^3$

Answer: C

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31. SRP of Sn^{2+} / Sn^{4+} is 0.5 , SRP of Au / Au^{3+} is 1.5, give reaction for the cell

A. $2Sn^{2+} + 3Au^{3+} \rightarrow 2Sn^{4+} + 3Au$

B. $3Sn^{2+} + 2Au^{3+} \rightarrow 3Sn^{4+} + 2Au$

C. $2Sn^{4+} + 3Au \rightarrow 2Sn^{2+} + 3Au^{3+}$

D. $3Sn^{4+} + 2Au \rightarrow 3Sn^{2+} + 2Au^{3+}$

Answer: B

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32. Oxidation potential of unimolar calomel electrode is

A. $0.242V$

B. $-0.28V$

C. $-0.33V$

D. $-0.43V$

Answer: B

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33. $Cd|Cd^{2+}||Fe^{3+}|Fe^{2+}$ reaction, on $+ve$ electrode is

A. $Fe^{3+} + e^- \to Fe^{2+}$

B. $Fe^{++} + e^- \to Fe^+$

C. $Fe^{3+} + 2e^- \to Fe^+$

D. $Cd \to oCd^{2+} + 2e^-$

Answer: A

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34. One ampere and one second =______ electrons.

A. 6.25×10^{23}

B. 6.25×10^{18}

C. 6.25×10^{20}

D. 6.023×10^{22}

Answer: B

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35. Molten sodium chloride conducts electricity due to the presence of

A. Free electrons

B. Sodium chloride molecules

C. Free ions

D. Free atoms of sodium and chlorine

Answer: C

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36. The electrode potential of oxidation half cell

A. is independent of concentration of the ions in the cell

B. decreases with decreased concentration of the ions in the cell

C. decreases with increased concentration of the ions in the cell

D. is independent of temperature

Answer: C

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37. 1 mole of electrons is passed through three electrolytic cells in series , first containing silver ions, the second zinc ions and third ferric ions, assuming that the only cathode reaction in each cell reduces the ions to the metal , the number of moles of each metal deposited will be

A. Ag(0.3 mol),Zn(1mol),Fe(1 mol)

B. Ag(0.5 mol), Zn(0.33 mol), Fe(1 mol)

C. Ag(1 mol), Zn(0.5 mol), Fe (0.33 mol)

D. Ag(0.5 mol),Zn(1 mol),Fe(0.33 mol)

Answer: C

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38. In the electrolysis of H_2SO_4 0.2 gram hydrogen is produced, hence the weight of another substance produced is

A. 1.6 gram

B. 3.2 gram

C. 6.1 gram

D. 19.2 gram

Answer: A

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39. For the reaction ,

$$H_{2(g)} + Hg_2Cl_2 \rightarrow 2Hg_{(l)} + 2HCl_{(aq)}$$

electrochemical cell will be:

A. $Pt, H_2|HCl||$Calomel electrode

B. $Hg|Hg(NO_3)_2||$Calomel electrode

C. Calomel electrode$||HCl|H_2 _ ((g)), Pt$

D. $Hg|Hg_2Cl_2, KCl| \mid Hg(NO_3)_2|Hg$

Answer: A

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40. To reduce 5 gram equivalents of cupric ions (Cu^{2+}) to solid copper metal (Cu) , the number of Faradays of electriclty required would be

A. 10 F

B. 2 F

C. 20 F

D. 5 F

Answer: D

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41. To prevent corrosion, iron pipes carrying drinking water are covered with zinc. The process involved is

A. Electroplating

B. Soldering

C. Galvanising

D. Alloy formation

Answer: C

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42. The standard oxidation potentials of two metals M_1 and M_2 are 0.76 V and $-0.34V$respectively. If a rod of metal M_1 is dipped into an aqueoud solution of metal M_2 , then the following happens,

A. no reaction takes place

B. reaction takes place

C. metal M_2 will be deposited at M_1

D. metal M_1 will be deposited at M_2

Answer: C

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43. The electrolyte used in mercury cell is

A. aqueous copper sulphate solution

B. aqueous zinc sulphate solution

C. paste of mercuric oxide mixed with KOH

D. dilute sulphuric acid

Answer: C

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44. Oxidatio potential of Al, Cu,Zn and Ag are given and series of reaction . Identify the correct group pf reaction :

$E^0_{Al} = 1.66V, E^0_{Cu} = -0.34V,$

$E^0_{Zn} = 0.76V, E^0_{Cu} = -0.8V$

A. $AlCl_3 + 3Ag \to 3AgCl + Al,$

$CuSO_4 + 2Ag \to Ag_2SO_4 + Al$

$ZnSO_4 + 2Ag \to Ag_2SO_4 + Zn,$

$ZnSO_4 + Cu \to CuSO_4, Zn$

B. $2AlCl_3 + 3Zn \to 3ZnCl_2 + 2Al,$

$ZnCl_2 + Cu \to CuCl_2 + Zn$

$CuSO_4 + Zn \to ZnSO_4 + Cu,$

$3ZnSO_4 + 2Al \to Al_2(SO_4)_3 + 3Zn$

C. $2AlCl_3 + 3Cu \rightarrow 3CuCl_2l + 2Al,$

$3ZnSO_4 + 2Al \rightarrow Al_2(SO_4)_3 + 3Zn$

$CuSO_4 + 2Ag \rightarrow Ag_2SO_4 + 3Zn$

$2AlCl_3 + 3Zn \rightarrow 3ZnCl_2 + 2Al$

D. $3ZnSO_4 + 2Al \rightarrow Al_2SO_4 + 3Zn,$

$CuSO_4 + Zn \rightarrow ZnSO_4 + Cu$

$2AgNO_3 + Cu \rightarrow Cu(NO_3)_2 + 2Ag$

$3CuSO_4 + 2Al \rightarrow Al_2(SO_4)_3 + 3Cu$

Answer: D

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45. How many coulombs are required for the oxidation of 0.01 mol of $H_2O \rightarrow O_2$?

A. $1.93 \times 10^3 C$

B. $9.65 \times 10^2 C$

C. $3.86 \times 10^5 C$

D. $4.285 \times 10^2 C$

Answer: A

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46. Which of the following statements justifies the dual behaviour of atmosphere after learning the reactions ?

$2S_2O_3^{2-} + I_2 \rightarrow oS_4O_6^{2-} + 2I^-$

$S_2O_3^{2-} + 2Br + 5H_2O \rightarrow 2SO_4^{2-} + 2Br^- + 10H^+$

A. bromine is stronger oxidant than iodine

B. bromine is weaker oxidant than iodine

C. thiosulphate undergoes oxidation by bromine and reduction by iodine in these reactions

D. bromine undergoes oxidation and iodine undergoes reduction in these reaction

Answer: A

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47. Which of the following arrangements represent increaseing oxidation number of the central atom?

A. $CrO_2^-, ClO_3^-, CrO_4^{2-}, MnO_4^-$

B. $ClO_3^-, CrO_4^{2-}, MnO_4^-, CrO_2^-$

C. $CrO_2^-, ClO_3^-, MnO_4^-, CrO_4^{2-}$

D. $CrO_4^{2-}, MnO_4^-, CrO_2^-, ClO_3^-$

Answer: A

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48. Which of the following atom with outer electronic configuration exhibit maximum oxidation state ?

A. $3s^1$

B. $3d^1 4s^2$

C. $3d^2 4s^2$

D. $4s^2 3d^2$

Answer: D

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49. Which of the following solutions has the highest equivalent conductance at infinite dilution ?

A. HCOOH

B. CH_3COOH

C. ph-COOH

D. HCl

Answer: D

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50. How many Faradays of electricity are required to deposit 10 g of calcium from molten calcium chloride using inert electrodes ?

(molar mass of calcium = $40 g mol^{-1}$)

A. 0.5 F

B. 1 F

C. 0.25 F

D. 2 F

Answer: A

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51. In the cell represented by

$Pb(s)|Pb^{2+}(1M)||Ag^{+}(1M)|Ag(s)$ the reducing agent is

A. Pb

B. Pb^{2+}

C. Ag

D. Ag^{+}

Answer: A

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52. In dry cell, what acts as a negative electrode?

A. Zinc

B. Graphite

C. Ammonium chloride

D. Manganese dioxide

Answer: A

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53. Identify the weakest oxidising agent among the following.

A. Li^{+}

B. Na^{+}

C. Cd^{2+}

D. I_2

Answer: A

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54. What is the SI unit of conductivity?

A. Sm

B. Sm^{-1}

C. Sm^{2}

D. Sm^{-2}

Answer: B

Watch Video Solution

55. Which among the following equations represents the reduction reaction reaction taking place in lead accumulator at positive electrode, while it is being used as a source of electrical energy ?

A. $Pb \rightarrow Pb^{2+}$

B. $Pb^{4+} \rightarrow Pb$

C. $Pb^{2+} \rightarrow Pb$

D. $Pb^{4+} \rightarrow Pb^{2+}$

Answer: D

View Text Solution

Test your Grasp

1. An electric current is passed through an aqueous solution of the following . Which one shall decompose ?

A. Urea

B. Glucose

C. $AgNO_3$

D. C_2H_5OH

Answer: C

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2. Electrolysis involves oxidation and reduction respectively at .

A. anode and cathode

B. cathode and anode

C. both

D. either (a) and (b)

Answer: A

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3. The metal which can not displace hydrogen from dil. H_2SO_4 solution is

A. Zn

B. Al

C. Fe

D. Ag

Answer: D

View Text Solution

4. The amount of electricity required to deposit one gram atom of Mg from its molten salt is

A. 96500 C

B. 1.93×10^5C

C. 1 C

D. 4825 C

Answer: B

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5. During electrolysis electrons flow from

A. exchanged

B. transferred

C. gained by cation and lost by inion

D. lost by cation and gained by anion

Answer: C

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6. In a solution of $CuSO_4$ how much time will be required to preciitate 2 g copper by 0.5 ampere current?

A. 1217.6 sec

B. 102 sec

C. 5100 sec

D. 6420 sec

Answer: A

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7. 0.1 ampere current is passed for 10 seconds through Cu and Ag. The metal that will deposit more is

A. Cu

B. Ag

C. both equally

D. cannot be pridicated

Answer: B

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8. How many electrons are there in one coulomb of electricity?

A. 6.02×10^{21}

B. 6.02×10^{16}

C. 6.24×10^{18}

D. 6.24×10^{15}

Answer: C

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9. The emf of cell is 1.3 Volt. The positive electrode has potential of 0.5 volt. The potential of negative electrode is

A. 0.8 V

B. $-0.8V$

C. $1.8V$

D. $-1.8V$

Answer: B

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10. How many Faradays are required to liberate one mole of O_2 gas at N.T.P. during electrolysis of dilute NaOH solution ?

A. 1

B. 2

C. 3

D. 4

Answer: B

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11. A silver cup is plated with silver by passing 965 coulombs of electricity . The amount of Ag deposited is

A. 1.0787 gm

B. 1.0002 gm

C. 9.89 gm

D. 107.89 gm

Answer: A

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12. A, B,C and D are four elements with $E^0_{\otimes d}$ as $+2.82V, +2.71V, +1.67V, -2.87V$ respectively . The strongest reducing agent is

A. A

B. B

C. C

D. D

Answer: A

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13. During rusting of iron it gets

A. oxidised

B. reduced

C. Oxidised and hydrated

D. hydrated

Answer: C

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14. The electrode potential of a silver electrode dipped in 0.1 M $AgNO_3$ solution at 298K is

(E° red of Ag =0.80 volt)

A. 0.0741 V

B. 0.0591 V

C. 0.741 V

D. 0.859 V

Answer: D

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15. A certain current liberated 0.504 g of hydrogen in 2 hours. How many gram of copper can be liberated by the same current flowing for the same time in $CuSO_4$ solution ?

A. 12.79 g

B. 31.75 g

C. 15.87 g

D. 63.5 g

Answer: C

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16. The rusting of iron is catalysed by which of the following ?

A. Ferric oxide

B. O_2

C. Zn

D. H^+

Answer: D

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17. In a cell containing zinc electrode and hydrogen electrode,If the reduction potential of zinc is -0.74 V, the zinc electrode acts as

A. anode

B. cathode

C. null electrode

D. either (a) and (b)

Answer: A

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18. E° of $Mg^{2+}||Mg$, $Zn^{2+}||Zn$, and $Fe^{2+}\ |\ |\ Fe$ are -2.37V, -0.76V and -0.44 V respectively. Which of the following is correct?

A. Mg oxidises Fe

B. Zn oxidises Fe

C. Zn reduces Mg^{2+}

D. Zn reduces Fe^{2+}

Answer: D

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19. The reaction $M^{2}+2e^{-} \rightarrow M$ has standard potential of $-0.66V$. This means

A. M cannot replace hydrogen from acid

B. M is a reducing agent

C. Both are equally strong

D. The cell between M and H_2 is not possible

Answer: B

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20. Rgw atomic weight of Al is 27. When a current of $5F$ is passed through a solution of Al^{+++} ions, the qeight of AL deposited is.

A. 27 gm

B. 36 gm

C. 45 gm

D. 49 gm

Answer: C

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21. A certain current liberated 0.504 g of hydrogen in 2 hours. How many gram of copper can be liberated by the same current flowing for the same time in $CuSO_4$ solution ?

A. 12.7 gm

B. 16.0 gm

C. 31.8 gm

D. 63.5 gm

Answer: B

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22. In Nernst equation the constant 0.0591 at 298K represents the value of

A. $\frac{RT}{nF}$

B. $\frac{RT}{F}$

C. $\frac{2.303RT}{nF}$

D. $\frac{2.303RT}{F}$

Answer: D

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23. When an electric current is passed through acidified water, $112ml$ of H_2 gas at NTP is collected at the cathode is 965 seconds. The current passed in amperes is

A. 1

B. 0.1

C. 0.5

D. 2

Answer: A

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24. When 96500 coulomb of electricity is passed through a copper sulphate solution, the amount of copper deposited will be:

A. 0.25 mole

B. 0.5 mole

C. 1.0 mole

D. 2.0 mole

Answer: B

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25. The standard reduction potentials of metals A and B are x and y respectively. If $x > y$. The standard emf of the cell containing these electrodes would be

A. 2x-y

B. y-x

C. x-y

D. x+y

Answer: C

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26. A solution of electrolyte in water, when electrolysed , liberated H_2 at the cathode and Cl_2 at the anode. The electrolyte must be

A. $H_2SO_{4(aq)}$

B. $CuCl_{2(aq)}$

C. $NaCl_{(q)}$

D. $Na_2SO_{4(aq)}$

Answer: C

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27. In a salt bridge KCl is used because

A. KCl is present in the calomel electrode

B. $K^{+} \text{and} Cl^{-}$ ion have the same transport number

C. $K^{+} \text{and} Cl^{-}$ are isoelectrons

D. KCl is an electrolyte

Answer: B

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28. Which of the following is not an anode reaction ?

A. $Ag^{+} \rightarrow Ag - 1e^{-}$

B. $Cu \rightarrow Cu^{2+} + 2e^{-}$

C. $Fe \rightarrow Fe^{3+} + 3e^{-}$

D. $4OH^{-} \rightarrow 2H_2O + O_2 + 4e^{-}$

Answer: A

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29. The standard reduction potential for Fe^{2+}/Fe and Sn^{2+}/Sn electrodes are -0.44 and -0.14 volt respectively. For the given cell reaction $Fe^{2+} + Sn \rightarrow Fe + Sn^{2+}$, the standard EMF is.

A. 0.3 V

B. $-0.58V$

C. 0.58 V

D. $-0.3V$

Answer: A

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30. Four colourless salt solutions are placed in separate test tubes and a strip of copper is dipped in each. Which solution finally turns blue ?

A. $Pb(NO_3)_2$

B. $Zn(NO_3)_2$

C. $AgNO_3$

D. $Cd(NO_3)_2$

Answer: B

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31. The ECE of metal is z the mass of metal deposited by the passage of 500 mA current through the solution for four minutes will be

A. 2000 z g

B. 1200 z g

C. 120 z g

D. 2 z g

Answer: C

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32. The oxidation potential of Zn, Mg , Ni and Cu are -0.76 V, 2.37V, 0.25V and $-0.34V$ respectively. What will not be liberating H_2 from HCl /

A. Zn

B. Ni

C. Mg

D. Cu

Answer: D

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33. In the lead storage battery during discharging

A. pH of the electroyte increases

B. pH decreses

C. pH remains unchanged

D. pH increases or decreases depends on the extent of discharging

Answer: A

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34. The substance obtained at the cathode on electrolysis of NaOH solution

A. H_2O

B. Na

C. H_2

D. O_2

Answer: C

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35. When zinc rod is directly placed in copper sulphate solution /

A. The blue colour of solution starts intensifying

B. The solution remains electrically neutral

C. The temperature of solution falls

D. The weight of zinc rod starts increasing

Answer: B

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36. The e.mf. Of a cell depends on

A. temperature

B. nature of electrode

C. concentration of solution in the two half cells

D. all of these

Answer: C

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37. If m is the mass of a substance with equivalent weight E and Q is quantity of electicity passed , then

A. $m \propto \frac{1}{Q}$

B. $m \propto Q.\,E$

C. $m \propto \frac{1}{E}$

D. $m \propto Q$

Answer: B

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38. When a lead storage battery is charged:

A. Lead dioxide dissolves

B. H_2SO_4 is regenerated

C. Lead electrode becomes coated with $PbSO_4$

D. The amount of H_2SO_4 decreases

Answer: B

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39. The following four colourless salt solutions are placed in separate test tubes and a strip of Cu is placed in each. Which solution os aluminium nitrate ?

A. $Zn(NO_3)_2$

B. $AgNO_3$

C. $Cd(NO_3)_2$

D. $Pb(NO_3)_2$

Answer: B

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40. What will happen when copper spon is used to stir a solution of aluminium nitrate /

A. The spoon will get cooled with aluminium

B. The solution will tirn blue

C. An alloy of Cu and Al is formed

D. There will be no reaction

Answer: D

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41. If a salt bridge is removed between the two half cells in an experiment , the voltage

A. does not change

B. increases rapidly

C. decreases slowly

D. falls to zero

Answer: D

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42. The quantity of electricity required to librate 0.1 g equivalent of an element at the electrode is

A. 9650 F

B. 96500 C

C. 9650 C

D. 96500 F

Answer: C

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43. The e.m.f of a cell containing of standard hydrogen electrode and a zinc electrode is found to be 0.74 volt. The SHE is the positive electrode in the combination. Then the potential of the zinc electrode is

A. 0.74 volt

B. $+1.74$ volt

C. -0.74volt

D. $+0.37$volt

Answer: C

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44. The SRP of cadmium and copper electrodes are -0.4 volt and +0.34volt respectively. The e.m.f. of the cell formed from them is

A. 0.74Volt

B. -0.06 volt

C. -0.74volt

D. $+0.06$volt

Answer: A

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45. The e.m.f of the cell $Zn|Zn^2||Cu^{2+}|Cu$ can be increased by

A. increasing the concentration of Zn^{2+} in the solution

B. increasing the concentration of Cu^{2+} in the solution

C. increasing the distance between the electrodes

D. increasing the surface area of the electrodes

Answer: B

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46. The conduction of electricity occurs by a direct low of electrons under the influence of applied potential are known as

A. electro conductor

B. electronic conductor

C. electrolytic conductor

D. electrochemical conductor

Answer: B

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47. The current flow in electrolytic conductors is due to

A. migration of atoms

B. migration of electrons

C. migration of positive and negative ions

D. migration of molecules

Answer: C

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48. Which of the following acid is involved in corrosion of iron ?

A. Carbolic acid

B. Carboxylic acid

C. Carbonic acid

D. Nitric acid

Answer: C

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49. During corrosion, iron is coated by

A. Ferric oxide

B. Ferrous oxide

C. hydrated ferrous oxide

D. hydrated ferric oxide

Answer: D

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50. A hydrogen gas electrode is made by dipping platinum wire in a solution having pH =4 and by passing hydrogen gas around the platinum wire at one atm. Pressure. The oxidation potential of electrode would be

A. 0.236V

B. 2.36V

C. 0.933V

D. 1.475V

Answer: A

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