

NEET : CHAPTER WISE TEST-2

SUBJECT :- CHEMISTRY

CLASS :- 12th

CHAPTER :- ELECTROCHEMISTRY

DATE.....

NAME.....

SECTION.....

(SECTION-A)

1. In a galvanic cell
(A) chemical reaction produces electrical energy
(B) electrical energy produces chemical reaction
(C) reduction occurs at anode
(D) oxidation occurs at cathode
2. Which is not true for a standard hydrogen electrode ?
(A) The hydrogen ion concentration is 1 M
(B) Temperature must be 25°C
(C) Pressure of hydrogen is 1 atmosphere
(D) All are correct
3. KCl can be used in salt bridge as electrolyte in which of the following cells?
(A) Zn | ZnCl₂ || AgNO₃ | Ag
(B) Pb | Pb(NO₃)₂ || Cu(NO₃)₂ | Cu
(C) Cu | CuSO₄ || AuCl₃ | Au
(D) Fe | FeSO₄ || Pb(NO₃)₂ | Pb
4. The $E^\circ_{M^{3+}/M^{2+}}$ values for Cr, Mn, Fe and Co are - 0.41, + 1.57, + 0.77 and +1.97 V respectively. For which one of these metals the change in oxidation state from +2 to +3 is easiest?
(A) Co (B) Mn (C) Fe (D) Cr
5. Standard reduction electrode potentials of three metals A, B and C are +0.5 V, - 3.0 V and - 1.2 V respectively. The reducing power of these metals are :
(A) B > C > A (B) A > B > C
(C) C > B > A (D) A > C > B
6. The metal that cannot be produced on reduction of its oxide by aluminium is :
(A) K (B) Mn (C) Cr (D) Fe
7. If $E^\circ_{Fe^{2+}/Fe} = - 0.441$ V and $E^\circ_{Fe^{3+}/Fe^{2+}} = 0.771$ V, the standard EMF of the reaction $Fe + 2Fe^{3+} \longrightarrow 3Fe^{2+}$ will be:
(A) 1.212 V (B) 0.111 V
(C) 0.330 V (D) 1.653 V
8. What is the electrode potential (in V) of the following electrode at 25°C ?
 $Ni^{2+} (0.1 M) | Ni(s)$
(Standard reaction potential of $Ni^{2+} | Ni$ is - 0.25 V, $\frac{2.303 RT}{F} = 0.06$)
(A) - 0.28 V (B) - 0.34 V
(C) - 0.82 V (D) - 0.22 V
9. Find the emf of the Given, $E^\circ_{Pb^{2+} / Pb} = - 0.12$ V ; $E^\circ_{Zn^{2+} / Zn} = - 0.76$ V.
cell $Zn/Zn^{2+} (0.1 M) || Pb^{2+} (1 M) | Pb$.
(A) - 0.637 (B) + 0.637
(C) > 0.637 (D) + 0.889
10. Which represent a concentration cell ?
(A) Pt | H₂ | HCl || HCl | PtH₂
(B) Pt | H₂ | HCl || Cl₂ | Pt
(C) Zn | Zn²⁺ || Cu²⁺ | Cu
(D) Fe | Fe⁺² || Cu²⁺ | Cu
11. $Zn | Zn^{2+} (C_1) || Zn^{2+} (C_2) | Zn$. for this cell ΔG is negative if -
(A) $C_1 = C_2$ (B) $C_1 > C_2$
(C) $C_2 > C_1$ (D) None
12. During the electrolysis of fused NaCl, the reaction that occurs at the anode is :
(A) Chloride ions are oxidized
(B) Chloride ions are reduced
(C) Sodium ions are oxidized
(D) Sodium ions are reduced
13. An acidic solution of copper (II) sulphate containing some contaminations of zinc and iron (II) ions was electrolysed till all the copper is deposited. If electrolysis is further continued for sometime, the product liberated at cathode is
(A) Fe (B) Zn
(C) H₂ (D) Alloy of Zn and Fe.
14. The amount of an ion discharged during electrolysis is not directly proportional to :
(A) resistance
(B) time duration of electrolysis
(C) charge
(D) electrochemical equivalent of the element
15. Faraday's law of electrolysis fails when :
(A) Temperature is increased
(B) Inert electrodes are used
(C) A mixture of electrolytes is used
(D) In none of the above cases
16. How many faradays are required to reduce one mol of MnO_4^- to Mn^{2+} -
(A) 1 (B) 2 (C) 3 (D) 5

17. The amount of electricity that can deposit 108 g. of silver from silver nitrate solution is :
 (A) 1 ampere (B) 1 coulomb
 (C) 1 Faraday (D) 2 ampere
18. An electrolysis of a oxytungsten complex ion using 1.10 A for 40 min produces 0.838 g of tungsten. What is the charge of tungsten in the material ? (Atomic weight : W = 184)
 (A) 6 (B) 2 (C) 4 (D) 1
19. The weight ratio of Al and Ag deposited using the same quantity of current is:
 (A) 9 : 108 (B) 2 : 12
 (C) 108 : 9 (D) 3 : 8
20. When a lead storage battery is discharged
 (A) PbSO_4 is formed (B) Pb is formed
 (C) SO_2 is consumed (D) H_2SO_4 is formed
21. The units of conductivity are
 (A) ohm^{-1} (B) $\text{ohm}^{-1} \text{cm}^{-1}$
 (C) $\text{ohm}^{-2} \text{cm}^2 \text{equiv}^{-1}$ (D) $\text{ohm}^{-1} \text{cm}^2$
22. At 18°C , the equivalent conductivity of H^+ and CH_3COO^- at infinite dilution are 315 and $35 \text{ mho cm}^2 \text{eq}^{-1}$ respectively. The equivalent conductivity of CH_3COOH at infinite dilution is $\text{mho cm}^2 \text{eq}^{-1}$
 (A) 350 (B) 280
 (C) 30 (D) 315
23. The ionization constant of a weak electrolyte is 25×10^{-6} while the equivalent conductivity of its 0.01 M solution is $19.6 \text{ S cm}^2 \text{eq}^{-1}$. The equivalent conductivity of the electrolyte at infinite dilution (in $\text{S cm}^2 \text{eq}^{-1}$) will be
 (A) 250 (B) 196
 (C) 392 (D) 384
24. Which of the following is/are function(s) of salt - bridge ?
 (A) It completes the electrical circuit
 (B) It maintains electrical neutrality by flow of ions between the two compartments through salt - bridge
 (C) It minimises the liquid - liquid junction potential
 (D) All of these
25. KCl can't be used in salt bridge if electrolyte of a galvanic cell contains :
 (A) Ag^+ - ions (B) Pb^{2+} - ions
 (C) Hg_2^{2+} -ions (D) All
26. The position of some metals in the electrochemical series in decreasing electropositive character is given as $\text{Mg} > \text{Al} > \text{Zn} > \text{Cu} > \text{Ag}$. What will happen if a copper spoon is used to stir a solution of aluminium nitrate?
 (A) The spoon will get coated with aluminium
 (B) An alloy of copper and aluminium is formed
 (C) The solution becomes blue
 (D) There is no reaction
27. For $\text{Zn}^{2+} / \text{Zn}$, $E^\circ = -0.76 \text{ V}$, for Ag^+ / Ag $E^\circ = 0.799 \text{ V}$. The correct statement is -
 (A) the reaction Zn getting reduced Ag getting oxidized is spontaneous
 (B) Zn undergoes reduction and Ag is oxidized
 (C) Zn undergoes oxidation Ag^+ gets reduced
 (D) No suitable answer
28. Electrode potential data are given below.
 $\text{Fe}^{3+} (\text{aq}) + \text{e}^- \longrightarrow \text{Fe}^{2+} (\text{aq}); E^\circ = + 0.77$
 $\text{Al}^{3+} (\text{aq}) + 3\text{e}^- \longrightarrow \text{Al} (\text{s}); E^\circ = - 1.66 \text{ V}$
 $\text{Br}_2 (\text{aq}) + 2\text{e}^- \longrightarrow 2\text{Br}^- (\text{aq}); E^\circ = + 1.08 \text{ V}$
 Based on the data given above, reducing power of Fe^{2+} , Al and Br^- will increase in the order :
 (A) $\text{Br}^- < \text{Fe}^{2+} < \text{Al}$ (B) $\text{Fe}^{2+} < \text{Al} < \text{Br}^-$
 (C) $\text{Al} < \text{Br}^- < \text{Fe}^{2+}$ (D) $\text{Al} < \text{Fe}^{2+} < \text{Br}^-$
29. Given standard electrode potentials :
 $\text{Fe}^{3+} + 3\text{e}^- \longrightarrow \text{Fe}; E^\circ = -0.036 \text{ volt}$
 $\text{Fe}^{2+} + 2\text{e}^- \longrightarrow \text{Fe}; E^\circ = -0.440 \text{ volt}$
 The standard electrode potential E° for $\text{Fe}^{3+} + \text{e}^- \longrightarrow \text{Fe}^{2+}$
 (A) -0.476 volt (B) -0.404 volt
 (C) 0.440 volt (D) 0.772 volt
30. Which of the following statements about the spontaneous reaction occurring in a galvanic cell is always true ?
 (A) $E^\circ_{\text{cell}} > 0$, $\Delta G^\circ < 0$, and $Q < K$
 (B) $E^\circ_{\text{cell}} > 0$, $\Delta G^\circ < 0$, and $Q > K$
 (C) $E^\circ_{\text{cell}} > 0$, $\Delta G^\circ > 0$, and $Q > K$
 (D) $E_{\text{cell}} > 0$, $\Delta G < 0$, and $Q < K$
31. In a galvanic cell the electrical work done is equal to -
 (A) Free energy change
 (B) mechanical work done
 (C) Thermodynamic work done
 (D) All of these

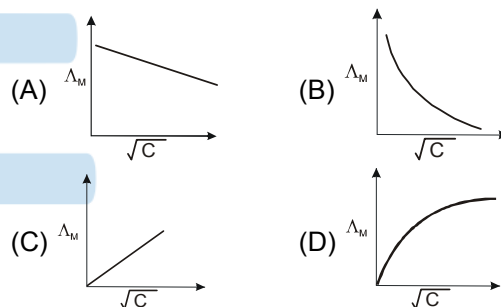
32. $\text{Pt} \left| \text{H}_2 \right|_{(p_1)} \left| \text{H}^+ \right|_{(1\text{M})} \parallel \left| \text{H}^+ \right|_{(1\text{M})} \left| \text{H}_2 \right|_{(p_2)} \left| \text{Pt} \right.$ (where p_1 and p_2 are pressures) cell reaction will be spontaneous if :
- (A) $p_1 = p_2$ (B) $p_1 > p_2$
 (C) $p_2 > p_1$ (D) $p_1 = 1 \text{ atm}$
33. The EMF of a concentration cell consisting of two zinc electrodes, one dipping into $\frac{M}{4}$ sol. of zinc sulphate & the other into $\frac{M}{16}$ sol. of the same salt at 25°C is
- (A) 0.0125 V (B) 0.0250 V
 (C) 0.0178 V (D) 0.0356 V
34. When current passed through electrolyte cation move towards cathode and anion move towards anode. If the cathode is pulled out of the solution
- (A) the positive and negative ions will move towards anode
 (B) the positive ions will start moving towards the anode while negative ions will stop moving
 (C) the negative ions will continue to move towards anode while positive ions will stop moving
 (D) the positive and negative ions will start moving randomly
35. In an electrolytic cell of $\text{Ag} \mid \text{AgNO}_3 \mid \text{Ag}$, when current is passed, the concentration of AgNO_3
- (A) Increases (B) Decreases
 (C) Remains same (D) None of these

(SECTION-B)

36. Three faradays of electricity was passed through an aqueous solution of iron (II) bromide. The mass of iron metal (at. mass 56) deposited at the cathode is -
- (A) 56 g (B) 84 g
 (C) 112 g (D) 168 g
37. A current of 9.65 ampere is passed through the aqueous solution NaCl using suitable electrodes for 1000 s. The amount of NaOH formed during electrolysis is
- (A) 2.0 g (B) 4.0 g
 (C) 6.0 g (D) 8.0 g
38. If 0.224 L of H_2 gas is formed at the cathode, the volume of O_2 gas formed at the anode under identical conditions, is
- (A) 0.224 L (B) 0.448 L
 (C) 0.112 L (D) 1.12 L

39. Electrolysis can be used to determine atomic masses. A current of 0.550 A deposits 0.55 g of a certain metal in 100 minutes. If valency of metal is 3 then its atomic mass will be :
- (A) 100 (B) 45.0
 (C) 48.25 (D) 144.75
40. When lead storage battery is charged :
- (A) lead dioxide dissolves
 (B) sulphuric acid is regenerated
 (C) the lead electrode becomes coated with lead sulphate
 (D) the amount of sulphuric acid decrease
41. Which is not correct method for prevention of iron from Rusting -
- (A) Galvanisation
 (B) Connecting to sacrificial electrode of Mg
 (C) Making medium alkaline
 (D) Making medium acidic

42. Which of the following curve represents the variation of Λ_M with \sqrt{C} for AgNO_3 ?



43. Molar conductivity of BaCl_2 , H_2SO_4 and HCl at infinite dilutions are x_1 , x_2 and x_3 , respectively. Equivalent conductivity of BaSO_4 at infinite dilution will be :
- (A) $\frac{[x_1 + x_2 - x_3]}{2}$ (B) $\frac{[x_1 - x_2 - x_3]}{2}$
 (C) $2(x_1 + x_2 - 2x_3)$ (D) $\frac{[x_1 + x_2 - 2x_3]}{2}$
44. Molar conductivity of 0.1 M acetic acid is 7 $\text{ohm}^{-1} \text{cm}^2 \text{mol}^{-1}$. If the molar cond. of acetic acid at infinite dilution is 380.8 $\text{ohm}^{-1} \text{cm}^2 \text{mol}^{-1}$, the value of dissociation constant will be :
- (A) $226 \times 10^{-5} \text{mol dm}^{-3}$
 (B) $1.66 \times 10^{-3} \text{mol dm}^{-1}$
 (C) $1.66 \times 10^{-2} \text{mol dm}^{-3}$
 (D) $3.442 \times 10^{-5} \text{mol dm}^{-3}$

45. Kohlrausch's law states that at :
- (A) Finite dilution, each ion makes definite contribution to equivalent conductivity of an electrolyte, whatever be the nature of the other ion of the electrolyte.
- (B) Infinite dilution, each ion makes definite contribution to equivalent conductivity of an electrolyte depending on the nature of the other ion of the electrolyte.
- (C) Infinite dilution, each ion makes definite contribution to conductance of an electrolyte, whatever be the nature of the other ion of the electrolyte.
- (D) Infinite dilution, each ion makes definite contribution to equivalent conductivity of an electrolyte, whatever be the nature of the other ion of the electrolyte.
46. Which of the following expressions correctly represents the equivalent conductivity at infinite dilution of $Al_2(SO_4)_3$. Given that $\Lambda_{Al^{3+}}$ and $\Lambda_{SO_4^{2-}}$ are the equivalent conductivities at infinite dilution of the respective ions?
- (A) $2\Lambda_{Al^{3+}} + 3\Lambda_{SO_4^{2-}}$
- (B) $\Lambda_{Al^{3+}} + \Lambda_{SO_4^{2-}}$
- (C) $(\Lambda_{Al^{3+}} + 3\Lambda_{SO_4^{2-}}) \times 6$
- (D) $\frac{1}{3}\Lambda_{Al^{3+}} + \frac{1}{2}\Lambda_{SO_4^{2-}}$
47. Consider the following relations for emf of an electrochemical cell :
- (i) EMF of cell = (Oxidation potential of anode) – (Reduction potential of cathode)
- (ii) EMF of cell = (Oxidation potential of anode) + (Reduction potential of cathode)
- (iii) EMF of cell = (Reduction potential of anode) + (Reduction potential of cathode)
- (iv) EMF of cell = (Oxidation potential of anode) – (Oxidation potential of cathode)
- Which of the above relations are correct
- (A) (iii) and (i) (B) (i) and (ii)
- (C) (iii) and (iv) (D) (ii) and (iv)
48. Assertion : The resistivity for a substance is its resistance when its is one meter long and its area of cross section is one square meter.
- Reason : The S.I units of resistivity are ohm metre (Ωm) and ohm centimeter (Ωcm).
- (A) If both assertion and reason are true and the reason is the correct explanation of the assertion.
- (B) If both assertion and reason are true but reason is not the correct explanation of the assertion.
- (C) If assertion is true but reason is false.
- (D) If the assertion and reason both are false.
49. Assertion : Zn metal is formed when a Cu plate is dipped in $ZnSO_4$ solution.
- Reason : Cu being placed above Zn in electrochemical series.
- (A) If both assertion and reason are true and the reason is the correct explanation of the assertion.
- (B) If both assertion and reason are true but reason is not the correct explanation of the assertion.
- (C) If assertion is true but reason is false.
- (D) If the assertion and reason both are false.
50. Assertion : Salts like KCl, KNO_3 i.e., inert electrolytes are used in salt bridge.
- Reason : An inert electrolyte can easily be filled in the U-tube.
- (A) If both assertion and reason are true and the reason is the correct explanation of the assertion.
- (B) If both assertion and reason are true but reason is not the correct explanation of the assertion.
- (C) If assertion is true but reason is false.
- (D) If the assertion and reason both are false.