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BSC_SEM_VI

NC-14 Physical Chem.+ Inorganic Chemistry- XV (CBCS)

Time: One Hour **Max. Marks: 40**

Instructions
Attempt All questions

1 The example of irreversible cell is

(A)Daniel cell (B)Dry cell (C)Lead Storage Battery (D)Zn| Zn^{++} || Cu^{++}| Cu

2 According to conventional representation, the electrode at which reduction takes place it acts as

(A)+ve electrode (B)Cathode (C)It has high reduction potential (D)All of these

3 Calomel electrode is . . . . . reference electrode

(A)primary (B)secondary (C)tertiary (D)

4 The relation between enthalpy change and and emf of cell is

(A) $\Delta G=-nFE$ (B) $\Delta H=-nFE+nFT\left(\frac{\partial E}{\partial T}\right)_p$ (C) $\Delta S=nF\left(\frac{\partial E}{\partial T}\right)_p$ (D) $\Delta G°=-RT\ln K$

5 The oxidation potential of calomel electrode for 0.1M KCl is

(A)-0.333V (B)-0.280V (C)-0.242V (D)None of these

6 In a galvanic or voltaic cell, the anode is always

(A)A nonmetal (B)Attached to a battery (C)At which oxidation takes place (D)At which reduction takes place

7 When $P_O > P_S$, then electrode acts as

(A)+ve electrode (B)-ve electrode (C)Null electrode (D)Reference electrode

8 The equation for emf of concentration cell with transport is

(A) $E= t_a \frac{RT}{F}\ln\frac{a_2}{a_1}$ (B) $E= \frac{RT}{F}\ln\frac{a_2}{a_1}$ (C) $E=\frac{n^2h^2}{8ma^2}$ (D) $E = h\nu$

9 In concentration cell without transport/ transference

(A)The two electrolyte solution are in direct contact (B)The two electrolyte solutions are not in direct contact (C)There is transfer of ions from one electrolyte solutions to the other takes place directly (D)None of the above

10 The limitation/disadvantage of glass electrode are

(A)The resistance of glass membrane is very-very high (B)It cannot be used in pure ethyl alcohol (C)It cannot be used in acetic acid and gelatine (D)All of these

11 The e.m.f.of SHE is arbitrarily taken constant as

(A)Zero volt (B)One volt (C)1.1 volt (D)None of these

12 Diamagnetic substances consist of

(A)One or more unpaired electron. (B)All paired electron. (C)Both A and B. (D)None of these.

13 When paramagnetic substance placed in magnetic field

(A)It gets attract by magnetic field. (B)It gets repelled by magnetic field. (C)There is no effect of magnetic field on substance. (D)None of these.

14 Iron, Cobalt, Nickel are examples of

(A)Paramagnetic (B)Diamagnetic (C)Ferromagnetic (D)None of these

15 Which type of substances obey the Curie's Law

(A)Ferromagnetic (B)Diamagnetic (C)Paramagnetic (D)A and C

16 The characteristics of diamagnetic substances are /is

(A)The line of forces tends to move away from the substance. (B)The magnetic susceptibility is negative. (C)The magnetic permeability μ is less than one. (D)All of these.

17 The work function 'A' is a

(A)State function property (B)Extensive property (C)Both A and B (D)None of these

18 The decrease in work function at constant temperature is measure of

(A)Maximum work done (B)Change in enthalpy (C)Change in entropy (D)Net change in internal energy.

19 Which of the following is not state function property

(A)Free energy function (G) (B)Internal energy (U) (C)Work done (W) (D)Entropy(S)

20 The variation of work function with Volume at constant temperature is given by an equation

(A) $\left(\frac{dA}{dV}\right)_T = -P$ (B) $\left(\frac{dA}{dV}\right)_T = P$ (C) $\left(\frac{dA}{dT}\right)_V = -S$ (D) $\left(\frac{dA}{dT}\right)_V = +S$

21 The relation between free energy function and work function is given as

(A)G = A – PV (B)G = A + PV (C)G = PV –A (D)G = -PV -A

22 Mathematically the partial molar internal energy is given by the equation

(A) $\overline{U_i}=\left(\frac{\partial U}{\partial n_i}\right)_{T,\ P,\ n_1,\ n_2\ \ldots}$ (B) $\overline{V_i}=\left(\frac{\partial V}{\partial n_i}\right)_{T,\ P,\ n_1,\ n_2\ \ldots}$ (C) $\overline{A_i}=\left(\frac{\partial A}{\partial n_i}\right)_{T,\ P,\ n_1,\ n_2\ \ldots}$ (D) $\overline{G_i}=\left(\frac{\partial G}{\partial n_i}\right)_{T,\ P,\ n_1,\ n_2\ \ldots}$

23 The variation of chemical potential with temperature is given by

(A) $\left(\frac{\partial \mu_i}{\partial T}\right)_{P,\ N} = \overline{S_i}$ (B) $\left(\frac{\partial \mu_i}{\partial T}\right)_{P,\ N} = -\overline{S_i}$ (C) $\left(\frac{\partial \mu_i}{\partial P}\right)_{T,\ N} = -\overline{V_i}$ (D) $\left(\frac{\partial \mu_i}{\partial P}\right)_{T,\ N} = \overline{V_i}$

24 The relation between K_p and K_X is

(A) $K_p = K_X(P)^{\Delta n}$ (B) $K_p = -K_X(P)^{\Delta n}$ (C) $K_p = K_X(P)$ (D) $K_p = K_X(\Delta n)$

25 The relation between standard free energy change and equilibrium constant is

(A) $\Delta G° = RT\ \ln K_p$ (B) $\Delta G° = -RT \ln K_p$ (C) $\Delta G° = R\ \ln K_p$ (D) $\Delta G° = T\ \ln K_p$

26 The equation $\frac{d \ln K_P}{dT} = \frac{\Delta H°}{RT^2}$ is known as

(A)Van't – Hoff equation (B)Gibbs equation (C)Gibbs- Duhem equation (D)Gibb – Helmholtz equation

27 The equation $\log \frac{P_2}{P_1} = \frac{\Delta H}{2.303R}\left[\frac{T_2 - T_1}{T_1 T_2}\right]$ is the integrated form of ..

(A)Clausius- Clapeyron equation (B)Van't- Hoff equation (C)Gibbs- Duhem equation (D)None of these

28 Which of the following is not the important biological role played by Na^+ ion

(A)IT regulates the acid base equilibrium. (B)It maintains osmotic pressure of extra cellular fluids. (C)It Carries oxygen to other part of body. (D)It preserves normal irritability of muscles.

29 In Na^+- K^+ Pump

(A)Na^+ ions are pumped out of cytoplasm. (B)K^+ ions are pumped out of cytoplasm. (C)Na^+ ions are pumped in side of cytoplasm. (D)Both ions are pumped out of cytoplasm.

30 -------- metal ion is present in Chlorophyll.

(A)Magnesium (B)Sodium (C)Calcium (D)Iron

31 Number of Nitrogen atoms present in porphin ring are

(A)One (B)Two (C)Three (D)Four

32 In Wade's rule each BH unit is assumed to be contributing --------- no of electron to the skeletal bonding in Boranes.

(A)One (B)Two (C)Three (D)Four

33 Number of electrons involved in hydrogen bridging bond of diborane.

(A)One (B)Two (C)Three (D)Four

34 In Carboranes BH unit is replaced by

(A)Carbon unit (B)Hydrogen unit (C)CH unit (D)BHC unit

35 Diborane on hydrolysis gives

(A)Hydroxy Borate (B)Boric acid (C)Halo Borane (D)Borazine

36 Hydrogen gas evolved when diborane reacts with

(A)Carbon monoxide (B)ammonia (C)Halogen acid (D)Halogen

37 The molecular formula for dicarbaclosododecacarborane is

(A)$CB_{10}H_{12}$ (B)$C_2B_{10}H_{12}$ (C)CB_5H_6 (D)$C_2B_5H_6$

38 According to wade's rule number of electron pair present in multicenter bonding orbitals of $(CH)_2B_{10}H_{10}$carborane is

(A)12 (B)13 (C)14 (D)10

39 When diborane reacts with ammonia it forms

(A)Boric Acid (B)Sodium Boro Hydride (C)Borazine (D)Halo borane

40 If a Carborane has (m+2) electron pair in it'smulticenter bonding orbital then it is classified as

(A)Nidocarborane (B)Closocarborane (C)ArchenoCarborane (D)None of these