

Q-1. CHOOSE THE CORRECT ANSWER FROM THE GIVEN OPTIONS

(1) Which of the following is the best semi permeable membrane?

[GUJCET-2007]

- [A] Cell wall of plants [B] Cellophane [C] Parchment paper * [D] Copper ferrocyanide

(2) Total order of reaction $X + Y \rightarrow XY$ is 3. The order of reaction with respect to X is 2. State the differential rate equation for the reaction.

[GUJCET-2015]

- [A] $-\frac{d[X]}{dt} = K[X]^3[Y]^0$ [B] $-\frac{d[X]}{dt} = K[X]^0[Y]^3$ * [C] $-\frac{d[X]}{dt} = K[X]^2[Y]$ [D] $-\frac{d[X]}{dt} = K[X][Y]^2$

(3) Which of the oxide shows appearance like metallic copper?

[October-2015]

- [A] TiO_2 [B] CrO_2 * [C] ReO_3 [D] VO_2

(4) From which enzymes are made?

[March-2019]

- [A] Vitamin [B] Lipid [C] Carbohydrates * [D] Protein

(5) Which of the following complex is useful in the dehydrogenation of alkanes?

[March-2018]

- * [A] $[(Ph_3P)_3 Rh Cl]$ [B] $[(Ph_3P) Rh Cl]$ [C] $[(Ph_3P)_3 Rh_2 Cl]$ [D] $[(Ph_3P)_3 Rh Cl_2]$

(6) $CO_{(g)} + H_{2(g)} \xrightarrow{[X]} HCHO_{(g)}$. In above reaction, what is [X]?

[March-2014]

- [A] Ni/ CrO_3 * [B] Cu [C] Ni [D] Cu/ZnO

(7) Which of the following gaseous molecule maximum physical adsorption enthalpy?

[March-2017]

- [A] C_2H_6 * [B] H_2O [C] H_2 [D] Ne

(8) Which of the following relation is correct for zero order reaction?

[March-2018]

- [A] $t_{\frac{1}{2}} \propto \frac{1}{[R]_0}$ * [B] $t_{\frac{1}{2}} \propto [R]_0$ [C] $t_{\frac{1}{2}} \propto \frac{1}{[R]_0^2}$ [D] $t_{\frac{1}{2}}$ is independent of $[R]_0$

(9) Choose the correct order of dissociation enthalpy of M-H bond in the 16th group.

[October-2012]

- [A] $H_2S < H_2O < H_2Se < H_2Te$ * [B] $H_2b > H_2S > H_2Se > H_2Te$ [C] $H_2S > H_2O > H_2Te > H_2Se$ [D] $H_2Se > H_2Te > H_2S > H_2O$

(10) Asphalt used for construction of roads is.....

[March-2016]

- [A] an emulsion of asphalt in oil. * [B] an emulsion of asphalt in water. [C] molten asphalt. [D] a solution of asphalt in water.

(11) Which of the following apparatus is used to decide positive or negative electric charge of colloid?

[March-2013]

- [A] Ultracentrifuge * [B] Electrophoresis [C] Ultrafilter paper [D] Mechanical dispersor

(12) Six substances along with their characteristics are given below. Select T if they all are correct and F if one/more are wrong. Select the proper option and answer the same. (T = True, F = False) [October 2012]

(i)	Ice	Molecular solid, almost insulator, hydrogen bond, Tetrahedral arrangement, possesses $H_{(aq)}^+$ and $OH_{(aq)}^-$
(ii)	Hg	Good conductor, Low melting, electron sea, metallic solid
(iii)	NaCl	Ionic solid, high melting, diamagnetic, FCC arrangement with 6 NaCl units in unit cell
(iv)	$O_{2(g)}$	Most abundant in earth crust, molecular gas, paramagnetic, insulator
(v)	Diamond	Tetrahedral arrangement, high melting, covalent solid, compound of carbon
(vi)	CrO_2	Liquid, metallic compound, electrical and magnetic properties similar to Iron.

- [A] T F T T T T [B] F T F T T F [C] T F T T F T * [D] F F F F F F

(13) Which of the following compound has highest melting point?

[October 2014]

- * [A] $SiO_{2(s)}$ [B] $H_2O_{(s)}$ [C] $Mg_{(s)}$ [D] $CO_{2(s)}$

(14) Which of the following is the unit cell dimensions of $K_2Cr_2O_7$?

[October 2013]

- * [A] $a \neq b \neq c, \alpha \neq \beta \neq \gamma \neq 90^\circ$ [B] $a = b = c, \alpha = \beta = \gamma = 90^\circ$ [C] $a \neq b \neq c, \alpha = \beta = \gamma = 90^\circ$ [D] $a = b \neq c, \alpha = \beta = \gamma \neq 90^\circ$

(15) The depression in freezing points is 0.69 K when 2g phenol is dissolved in 100g benzene. If it is associated as dimeric then find its degree of association. The molal depression constant for solvent is $5.12 K kg mol^{-1}$ (C = 12, H = 1, O = 16g/mol)

[October-2012]

- [A] 0.633 [B] 0.743 * [C] 0.367 [D] 0.734

Solution: $\Delta T_f = 0.69 K, W_2 = 2g, w_1 = 100g, M_2 = 94, n = 2, K_f = 5.12$

$$\Delta T_f = \frac{K_f \times 1000 \times w_2 \times i}{M_2 \times w_1}$$

$$i = \frac{0.69 \times 94 \times 100}{1000 \times 2 \times 5.12} = 0.633$$

$$\alpha = (1-i) \frac{n}{n-1} = (1-0.633) \times 2 = 0.733$$

- (16) Which of the following metals are present in German Silver?
 [A] Nickel, Silver and Copper [B] Zinc, Silver and Copper
 [C] Germanium, Silver and Copper [D] Zinc, Nickel and Copper
 [March–2018]
- (17) In which of the following pair both the crystals are not of the same type?
 *[A] Mg and Ar [B] NaCl and BaO
 [C] SiC and Diamond [D] Ice and solid SO₂
 [October 2016]
- (18) The space between valence band and conduction band is called.....
 [A] Conductivity gap *[B] Energy gap
 [C] Valence gap [D] Both (a) and (c)
 [October 2012]
- (19) What are the molecular and formula mass of Potash alum respectively?
 [A] 950, 480 *[B] 948, 474
 [C] 474, 948 [D] 480, 950
 [October–2012]
- (20) How very pure dinitrogen gas can be obtained?
 [A] By liquidification of air and fractional distillation. *[B] By thermal decomposition of sodium or barium azide.
 [C] By the reaction of aqueous ammonium chloride with aqueous sodium nitrite. [D] By thermal decomposition of ammonium dichromate.
 [October–2014]
- (21) Which of the following elements is not included in Group–15?
 [A] As [B] N
 [C] Se [D] Bi
 [October–2015]
- (22) Which gas is obtained by reacting Calcium Phosphide with water?
 [A] Arshine [B] Nitric oxide
 [C] Phosphine [D] Ammonia
 [October–2014]
- (23) For a reaction, the value of slope of a plot in $\ln K \rightarrow \frac{1}{T} = \dots\dots\dots$
 [A] $-\frac{E_a}{2.303}$ *[B] $-\frac{E_a}{R}$ [C] $-E_a$ [D] $-\frac{E_a}{2.303R}$
 [March–2018]
- (24) $\text{SO}_2 + 2\text{H}_2\text{S} \rightarrow \text{S} + 2\text{H}_2\text{O}$ which will be the method to obtain sulphur sol by reaction shown above?
 [A] Double decomposition *[B] Oxidation [C] Reduction [D] Hydrolysis
 [March–2011]
- (25) Which of the following alloy does not contain Copper?
 *[A] Nichrome [B] Bronze [C] Brass [D] German Silver
 [March–2013]
- (26) Which of the following oxide has the maximum basicity?
 *[A] La₂O₃ [B] Pr₂O₃ [C] Sm₂O₃ [D] Gd₂O₃
 [GUJCET–2015]
- (27) Which of the following solution having maximum vapour pressure at constant temperature?
NaCl = 58.5 H₂SO₄ = 98.0 gram/mole
 [A] 1 molar H₂SO₄ [B] 1 molal H₂SO₄ [C] 1 molar NaCl [D] 1 molal NaCl
 [GUJCET–2010, 2012] (Mole.wt. :
 [October–2016]
- (28) Which compound of phosphorus act as a ligands?
 [A] PCl₃ *[B] P(C₂H₅)₃ [C] PCl₅ [D] POCl₃
Solution: Phosphorus and arsenic elements form d_π – π bonds with transition metal elements in such compounds of phosphorous P(C₂H₅)₃ acts as ligands.
- (29) Which of the following is not a use of dioxygen gas?
 [A] Useful in preparation of steel [B] Useful in respiration and combustion reaction
 *[C] Useful as bleaching agent for bleaching of different oils [D] Useful in welding work of metals
 [October–2013]
- (30) Which method is used in refining of Titanium method?
 [A] Zone refining [B] Mond carbonyl [C] Frasch method *[D] Van Arkel's
 [October–2018]
- (31) The defect due to which crystal of NaCl shows yellow colour is
 [A] Frenkel defect [B] Impurity defect [C] Schottky defect *[D] Metal excess defect due to vacancy by anion
 [October 2013]
- (32) In which of the following pair of complexes, the experimental magnetic moment and the geometric shapes are same?
 [A] K₂[Ni(CN)₄] and K₄[Ni(CN)₄] [B] K₃[Fe(CN)₆] and K₄[Fe(CN)₆] *[C] K₂[Ni(CN)₄] and [Ni(NH₃)₂Cl₂] [D] K[MnO₄] and K₂[NiCl₄]
 [GUJCET–2017]
- Solution:** Oxidation number of Ni in K₂[Ni(CN)₄] is +2. Ni²⁺ = 3d⁸ 4s⁰ So, It will give square planer geometrical shape while K₂[Ni(NH₃)₂Cl₂] is square planer and diamagnetic.
- (33) By which method oxygen and nitrogen present in the form of impurities in Zirconium are removed?
 *[A] Van Arkel [B] Roasting [C] Liquefaction [D] Distillation
- (34) Diamond has fee crystal structure in which each carbon atom is attached with four other carbon atoms, then the number of carbon atoms per unit cell in diamond are.....
 [A] 12 [B] 6 [C] 8 [D] 4
 [October 2012]
- (35) According to collision theory Rate = $P \cdot Z \cdot e^{-\frac{E_a}{RT}}$ what does P indicate in the equation?
 [A] Pressure [B] Collision frequency [C] Arrhenius constant *[D] Probability factor
 [March–2017]
- (36) Which of the following compound has a square pyramidal structure?
 [A] XeO₃ [B] XeF₆ [C] XeOF₄ [D] XeF₄
 [October–2013]

(37) The depression in freezing point for 0.01m aqueous solution of $K_4[Fe(CN)_6]$ is 0.0744K. The molal depression constant for solvent is $1.86 K kg mol^{-1}$. If the solute undergoes complete dissociation, what is the correct molecular formula for the solute? [GUJCET-2017]

- *[A] $K_3[Fe(CN)_6]$ [B] $K_4[Fe(CN)_6]$ [C] $K[Fe(CN)_6]$ [D] $K_2[Fe(CN)_6]$

Solution: $\Delta T_f = i K_f \cdot m$ $0.0744 = i \times 1.86 \times 0.01$

$\therefore i = 4$ $\therefore n = 4$

Therefore, molecular formula = $K_3[Fe(CN)_6]$

(38) How many total moles of ions will be obtained by ionisation of one mole of Potassium Ferricyanide?

- [A] 5 *[B] 4 [C] 3 [D] 2

(39) What is the oxidation number of transition metal ion present in sodium nitroprusside? [March-2016]

- [A] +4 *[B] +2 [C] +3 [D] +5

(40) Which of the following is paramagnetic? [March 2018]

- [A] Zn^{2+} [B] O_2^{2-} [C] Cu^+ *[D] Cr^{3+}

(41) State the no. of co-ordinate bonds and no. of ions respectively in aqueous solution of ammonium diammine bisoxalato cobalt (III).

[March-2013]

- [A] 4, 5 [B] 5, 2 *[C] 6, 2 [D] 6, 5

(42) At which temperature both rhombic and monoclinic sulphur are stable? [Oct.-2014]

- *[A] 369 K [B] 396 K [C] 396° C [D] 369° C

(43) Which of the following gives H_2 on cathode and O_2 on anode on electrolysis by using platinum electrode?

- [A] Molten NaCl *[B] Dilute solution of NaCl [C] Concentrated solution of NaCl [D] Solid NaCl.

Solution: Electrolysis of dilute solution of NaCl is actually electrolysis of water only. So on reduction of water H_2 gas liberated on cathode and O_2 gas liberated on anode.

On anode: $H_2O_{(l)} \rightarrow 2H^+_{(aq)} + \frac{1}{2}O_{2(g)}$...(Oxidation)
On cathode: $2H_2O_{(l)} + 2e^- \rightarrow H_{2(g)} + 2OH^-_{(aq)}$... (Reduction)	
$3H_2O_{(l)} \rightarrow H_{2(g)} + \frac{1}{2}O_{2(g)} + (2H^+_{(aq)} + 2OH^-_{(aq)})$ Near cathode Near anode	

(44) Which explosive substance is obtained when proportion of dichlorine gas is more in the reaction with ammonia gas? [October-2019]

- [A] Nitrogen (II) oxide [B] Ammonium chloride *[C] Nitrogen trichloride [D] Ammonium chloride and dinitrogen gas

(45) Which is the ore of iron? [October-2015]

- [A] Calamine *[B] Haematite [C] Bauxite [D] Malachites

(46) How many spheres are required to form octahedral void? [October 2016]

- [A] 8 *[B] 6 [C] 4 [D] 12

(47) How many defects exists in the arrangement of constituent particles of 7.45 g KCl? [K = 39, Cl = 35.5 g/mole] [October 2014]

- [A] 10×10^{23} [B] 1×10^6 [C] 1.0×10^{-6} *[D] 10×10^4

Solution:

Number of moles of $KCl = \frac{7.45}{74.5} = 0.1$

1 mol KCl = 10^6 Schottky pairs

$\therefore 0.1$ mol KCl = 10^5 Schottky pairs

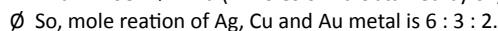
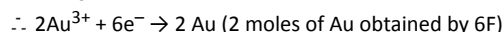
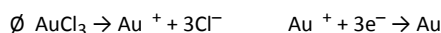
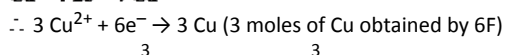
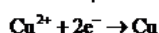
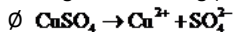
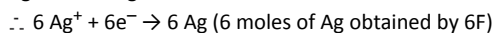
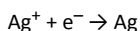
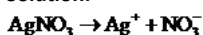
(48) Which of the following is the formula for Wilkinson Catalyst? [March-2014]

- [A] $[(Ph_3P)_2RuCl]$ *[B] $[(Ph_3P)_3RhCl]$ [C] $[(Ph_3P)_3RuCl]$ [D] $[(Ph_3P)_2RhCl]$

(49) When 6 faraday electricity is pass through aqueous solution of silver nitrate, copper sulphate and gold chloride ($AuCl_3$), then what ratio of mole of metals obtained at cathode? [October-2016]

- [A] 1 : 1 : 1 [B] 3 : 2 : 1 [C] 1 : 2 : 3 *[D] 6 : 3 : 2

Solution:



- (50) Which of the following compound of xenon possess square pyramidal structure? [October-2019]
 [A] XeO₂F₂ * [B] XeOF₄ [C] XeO₃ [D] XeF₆
- (51) Which of the following is a composition of bleaching powder? [October-2013]
 * [A] Ca(OCl)₂ • CaCl₂ • Ca(OH)₂ • 2H₂O [B] Ca(OCl)₂ • Ca(OH)₂ [C] CaOCl • CaCl₂ • Ca(OH)₂ [D] CaOCl • CaCl₂ • 2H₂O
- (52) Electrolytic cell containing molten nickel chloride and aluminium chloride solutions are arranged in a series. If on passing same current through both the solution, Al is obtained then how much Ni is obtained? (Atomic mass of Al = 27 and Ni = 58.5 gm mol⁻¹) [GUJCET-2015]
 * [A] 58.5 gm [B] 29.25 gm [C] 117 gm [D] 5.85 gm
- Solution:** (i) Reaction when Al metal is formed:
 $Al^{3+} + 3e^{-} \rightarrow Al_{(s)}$
 So, 3 mol e⁻ → 1 mol Al So, 27 gm Al required 3 F current. So for 18 gm Al, amount of electricity
 $= \frac{18 \times 3}{27} = 2F$
- (ii) 2 F current is also passed through Ni²⁺ solution as it is in series. $Ni^{2+} + 2e^{-} \rightarrow Ni_{(s)}$ 2F gives 1 mole Ni 2F gives 58.5 gm Ni
- (53) Which of the following complex ion shows optical isomerism? [March-2016]
 [A] P and Q both * [B] Q [C] P [D] P, Q and R
- (54) Which is decreasing order of coagulating power for positive charged sol? [March-2019]
 [A] Cl⁻ > SO₄²⁻ > PO₄³⁻ * [B] PO₄³⁻ > SO₄²⁻ > Cl⁻ [C] SO₄²⁻ > PO₄³⁻ > Cl⁻ [D] Cl⁻ > PO₄³⁻ > SO₄²⁻
- (55) In which of the following ion d-d transition is not possible? [GUJCET-2007]
 [A] Mn²⁺ [B] Cu²⁺ * [C] Ti⁴⁺ [D] Cr³⁺
- (56) Which statement is not suitable for interstitial compounds? [GUJCET-2016]
 [A] They are hard due to localisation of free electrons. * [B] Chemical bond is formed between metal & non-metal atom. [C] The proportion of components is not definite in such compounds. [D] They are resistant to wear and corrosion.
- (57) Mention the proper choice for the True and False statement. For True statement T and for False statement F are mentioned. (a) Oxygen element possesses -2, -1, +1, +2, oxidation state. (b) The value of electron gain enthalpy of Cl element is more negative than that of F element. (c) Ozone is colourless in solid form. (d) Chlorine water when kept for longer times loses yellow colour. [October-2015]
 [A] TFTF * [B] TTFT [C] TFFT [D] FTFT
- (58) What is the complete charging reaction of Ni-Cd storage cell? [GUJCET-2016]
 [A] Cd_(s) + 2Ni(OH)_{4(s)} → CdO_{2(s)} + 2Ni(OH)₂ + 2H₂O_(l) * [B] CdO_(s) + Ni(OH)_{2(s)} + H₂O_(l) → Cd_(s) + 2Ni(OH)_{3(s)} [C] Cd_(s) + 2Ni(OH)_{3(s)} → CdO_(s) + Ni(OH)_{2(s)} + H₂O_(l) [D] CdO_{2(s)} + 2Ni(OH)₂ + 2H₂O_(l) → Cd_(s) + 2Ni(OH)_{3(s)}
- (59) For any chemical reaction, value of slope of $\ln K \rightarrow \frac{1}{T}$ graph will be [March-2014]
 [A] $-\frac{E_a}{2.303R}$ * [B] $-\frac{E_a}{R}$ [C] $-\frac{E_a}{2.303R}$ [D] -E_a
- (60) The Zinc metal that we get on commercial basis is called.... [October-2016]
 [A] Zincite [B] Blister * [C] Spelter [D] None of these
- (61) What is the value of Van't Hoff factor for dilute Ferrous sulphate (aqueous) solution. [October-2016]
 [A] < 1 [B] Zero * [C] > 1 [D] 1
- Solution:**
 $FeSO_4 \xrightarrow{\text{Water}} \underbrace{Fe^{2+}_{(aq)} + SO_4^{2-}_{(aq)}}_{\text{Total 2 ions}}$
 ∴ i = Van't Hoff factor > 1
- (62) The half reaction time required to decrease initial concentration from 40% to 20% is 20 minute. What time will be taken to decrease initial concentration from 10% to 5%? [March-2013]
 [A] 20 minute * [B] 5 minute [C] 10 minute [D] 60 minute
- (63) What is the aquaregia? [October-2012]
 * [A] 3 parts of cone. HCl + 1 part of cone. HNO₃ [B] 2 parts of cone. HCl + 2 parts of cone. HNO₃ [C] 1 part of cone. HCl + 3 parts of cone. HNO₃ [D] None of these
- (64) Which are the correct uses of potassium dichromate from the following? [March-2019] (i) As an indicator in redox titration (ii) As a reagent in COD measurement (iii) As reducing agent in synthesis of organic compounds (iv) In leather industry
 [A] (i) * [B] (ii) and (iv) [C] (i) and (iii) [D] (i), (ii) and (iii)
- (65) What is the colour of [Ti(H₂O)₆]³⁺? [March-2017]
 * [A] Violet [B] Blue [C] Pink [D] Green
- (66) Which of the following will have less value than zero during adsorption? [March-2015]
 [A] Δ G [B] Δ H [C] Δ S * [D] All the given three options.

- (67) Which colligative property is more useful to determine the molecular weight of the substances like proteins and polymers? **[GUJCET-2015]**
 [A] Lowering of vapour pressure. [B] Elevation in boiling point. [C] Depression of freezing point. *[D] Osmotic pressure.
- (68) Which of the following complex compound does not possess tetrahedral geometry? **[March-2016]**
 [A] $K_4[Ni(CN)_4]$ [B] $[Ni(CO)_4]$ [C] $K[MnO_4]$ *[D] $K_2[Ni(CN)_4]$
- (69) Both $[Ni(CO)_4]$ and $[Ni(CN)_4]^{2-}$ are diamagnetic. The types of hybridisation of Ni in these complexes are and respectively. **[GUJCET-2015]**
 [A] sp^3, sp^3 *[B] sp^3, dsp^2 [C] dsp^2, sp^3 [D] dsp^2, dsp^2
- (70) Which of the following mixture of metals can not form alloy? **[March-2014]**
 *[A] Ni + Mg + Cr [B] Au + Cu + Cr [C] Fe + Cr + Cu [D] Ni + Cu + Cr
- (71) Which of the following is the least basic? **[March-2016]**
 *[A] $Yb(OH)_3$ [B] $Ce(OH)_3$ [C] $Nd(OH)_3$ [D] $Gd(OH)_3$
- (72) Which of the following spectrochemical series is true? **[GUJCET-2014]**
 [A] $SCN^- < NH_3 < F^- < en < CO$ *[B] $SCN^- < F^- < NH_3 < en < CO$ [C] $SCN^- < F^- < en < NH_3 < CO$ [D] $SCN^- < F^- < en < CO < NH_3$
- (73) Which of the following complex ions does not possess optical isomerism? **[March-2018]**
 [A] $[Co(CO)_4(en)]^{3+}$ [B] $[Co(en)(H_2O)_4]^{2+}$ [C] $[Co(en)_2(NH_3)_2]^{2+}$ *[D] $[Co(H_2O)_3Br_3]^{3+}$
- (74) In NaCl lattice structure if one of the sodium ion is removed from corner, the formula of the resulting compound is..... **[October 2012]**
 *[A] Na_7Cl_{24} [B] NaCl [C] $NaCl_3$ [D] Na_3Cl_n
- Solution:**
 Number of Na^+ ions = $\left(7 \times \frac{1}{8}\right) = \frac{7}{8}$
 Number of Cl ions = $\left(6 \times \frac{1}{2}\right) = 3$
 $\therefore Na^+ : Cl^- = \frac{7}{8} : 3$
 $= 7 : 24$
- (75) The order of ionic character in metal halides is **[October-2012]**
 *[A] $MF > MCl > MBr > MI$ [B] $MCl > MF > MBr > MI$ [C] $MF > MCl > MBr < MI$ [D] $MF > MCl < MBr < MI$
- (76) Which of the following relation is correct for first dual reaction? **[March-2019]**
 *[A] Reaction order = molecularity [B] Reaction order \leq molecularity [C] Reaction order $>$ molecularity [D] Reaction order $<$ molecularity
- Solution:** In the primary process, the number of species experiencing collision, is called the molecule of the process.
- (77) Which of the following cell is concentration cell? **[GUJCET-2014]**
 [A] $Cu_{(s)} | Cu_{(aq, 0.1M)}^{2+} || Cu_{(aq, 0.01M)}^{2+} | Cu_{(s)}$ [B] $Zn_{(s)} | Zn_{(aq, 0.5M)}^{2+} || Cu_{(aq, 0.1M)}^{2+} | Cu_{(s)}$ [C] $Cu_{(s)} | Cu_{(aq, 0.5M)}^{2+} || Cu_{(aq, 0.5M)}^{2+} | Cu_{(s)}$ *[D] $^{\ominus}Pt | H_{2(g, 1bar)} | HCl_{(aq, 0.002M)} || HCl_{(aq, 0.005M)} | H_{2(g, 1bar)} | Pt$
- (78) Which of the following relation is true for standard gibbs free energy change (ΔG^\ominus) and equilibrium constant K_p ? **[GUJCET-2011]**
 *[A] $K_p = e^{-\Delta G^\ominus/RT}$ [B] $K_p = -RT \ln \Delta G^\ominus$ [C] $K_p = \left(\frac{e}{RT}\right)^{\Delta G^\ominus}$ [D] $K_p = \frac{\Delta G^\ominus}{RT}$
- (79) Choose correct option for the statements given below. **[March-2015]** (Correct statement – T, incorrect statement – F) (i) Electronic configuration of transition metal ion is suitable for formation of complexes. (ii) A chemical bond is formed between non-metal and metal atoms in interstitial compounds. (iii) Crystal structures of Cu and Au are different.
 [A] T F F [B] F T T [C] T F T [D] T T F
- (80) In a first order reaction the time required for the concentration to decrease from 6 moles to 3 moles is 40 minutes, in such a reaction what time will be taken for the conversion reactant from 12 moles to 6 moles?
 [A] 20 minutes [B] 40 minutes [C] 80 minutes [D] 160 minutes
- (81) Which products are obtained on anode and cathode respectively when electrolysis of concentrated NaCl solution is carried out using graphite as electrodes? **[October-2013]**
 *[A] Cl_2 and H_2 [B] O_2 and Na [C] O_2 and H_2 [D] Cl_2 and Na
- (82) In a fee lattice, the number of neighbours for a given lattice point is..... **[October 2015]**
 *[A] 12 [B] 8 [C] 6 [D] 14
- (83) $(NH_4)_2Cr_2O_7 \xrightarrow{\Delta} N_{2(g)} + 4H_2O_{(l)} + X_{(s)}$ Mention the substance 'X' in this reaction. **[October-2015]**
 *[A] Cr_2O_3 [B] K_2CrO_4 [C] NH_3 [D] CrO_4
- (84) At the same temperature and pressure, which of the following gas will be adsorped in more proportion?
 [A] Cl_2 [B] N_2 [C] H_2 *[D] NH_3
- (85) Which alloy does not contain Ni metal? **[GUJCET-2016]**
 [A] German silver [B] Bronze [C] Stainless steel [D] Nichrome

(86) Which of the following ion has the maximum theoretical magnetic moment? [March-2018]

- [A] Ti^{3+} [B] V^{3+} [C] Cr^{3+} *[D] Co^{3+}

Solution: Co^{3+} has 4 unpaired electrons.

(87) Resistance of 1 N CH_3COOH is 250 ohm. This conductive cell has constant value of 1.15 cm^{-1} , then what is equivalent conductivity of 1N CH_3COOH ? ($\text{Ohm}^{-1}\text{ cm}^2\text{ equ}^{-1}$) [GUJCET-2010]

- [A] 18.4 *[B] 4.6 [C] 9.2 [D] 2.3

Solution:

$$(i) \text{ Conductivity} = (C) = \frac{1}{R} = \frac{1}{250}$$

$$= 0.004\text{ Ohm}^{-1} \quad (ii) \text{ Specific conductivity: } (K) = \text{conductivity} \times \text{cell constant} = 0.004 \times 1.15 (\text{ohm} \times \text{cm}^{-1}) = 0.00460\text{ ohm} \times \text{cm}^{-1}$$

(iii) equivalent conductivity:

$$*(A) = \frac{1000K}{C} = \frac{1000 \times 0.0046}{1}$$

$$= 4.6\text{ ohm}^{-1}\text{ cm}^2\text{ equ}^{-1}$$

(88) What is the colour of $[Ti(H_2O)_6]^{3+}$ complex ion? [March-2017]

- [A] Blue *[B] Violet [C] Pink [D] Green

(89) Which of the following statement is appropriate for physical adsorption? [March-2014]

- [A] More energy of activation is required. *[B] Multimolecular layers can be formed on the adsorbent. [C] There is no special effect of change in temperature. [D] It is irreversible.

(90) The limitation of crystal field theory led to the development of which of the following theories? [March-2016]

- [A] VSEPR *[B] Molecular orbital theory [C] Valance bond theory [D] Kossel Lewis approach

(91) What is the formula of salt prepared by the reaction between NaOH and hypophosphorous acid [GUJCET - 2007]

- [A] NaH_2PO *[B] Na_2HPO [C] Na_3PO_2 [D] Na_3PO_3

Solution: $2H_3PO_2 + 4NaOH \rightarrow 2Na_2HPO_2 + 4H_2O$

(92) In which metal vessels aqueous $CuSO_4$ solution can be store? [GUJCET- 2018]

$$E_{Cu^{2+}/Cu}^{\ominus} = 0.34\text{ V}$$

$$E_{Fe^{2+}/Fe}^{\ominus} = 0.44\text{ V}, E_{Al^{3+}/Al}^{\ominus} = 1.66\text{ V}$$

$$E_{Ni^{2+}/Ni}^{\ominus} = 0.25\text{ V}, E_{Ag^{+}/Ag}^{\ominus} = 0.80\text{ V}$$

- [A] Ag *[B] Ni [C] Fe [D] Al

Solution:

$$E_{Cu^{2+}/Cu}^{\ominus} = 0.34\text{ V}$$

$$\emptyset E_{Al^{3+}/Al}^{\ominus} = 1.66\text{ V and } E_{Al^{3+}/Al}^{\ominus} = -1.66\text{ V}$$

\emptyset So, in Al vessels, Cu^{2+} of $CuSO_4$ is reacted. $2Al_{(s)} + 3Cu^{2+} \rightarrow 2Al^{3+} + 3Cu_{(s)}$ \emptyset So reaction of $CuSO_4$ is occurred with Al vessels so $CuSO_4$ solution can't be store in Al.

$$E_{Ni^{2+}/Ni}^{\ominus} = 0.25$$

$$E_{Ni^{2+}/Ni}^{\ominus} = -0.25\text{ V}$$

So its value is less with respect to +0.34 Volt of $Cu^{2+} | Cu$. \emptyset So, oxidation of Ni gives reduction reaction of Cu^{2+} ions of solution so, $CuSO_4$ solution can't be stored in Ni vessels.

$$E_{Ag^{+}/Ag}^{\ominus} = 0.80\text{ V}$$

\emptyset This value is more compared to $Cu^{2+} | Cu$. So, there will be no reaction between Ag and Cu^{2+} . So, $CuSO_4$ solution can be filled in Ag vessels. Or emf series is as follows:

$$E_{Ag^{+}/Ag}^{\ominus} = 0.80\text{ V} \quad E_{Cu^{2+}/Cu}^{\ominus} = 0.34\text{ V}$$

$$E_{Ni^{2+}/Ni}^{\ominus} = -0.25\text{ V} \quad E_{Fe^{2+}/Fe}^{\ominus} = -0.44\text{ V}$$

\emptyset So, from Ag and Cu having more E_{red}^{\ominus} :

– no displacement of Cu^{2+} ions of solution by Ag. – no reduction of Cu^{2+} ions by Ag. – no reaction of Cu^{2+} with Ag. \emptyset But, Cu^{2+} ion can react with metals like Fe and Ni and liberate Cu so can't be fill.

(93) Which interhalogen compound is identified by spectroscopic method? [October-2015]

- [A] ICl *[B] IF [C] ClF [D] BrCl

(94) Which ion has the least value of theoretical magnetic moment? [GUJCET-2018]

- [A] Cr^{3+} [B] Co^{3+} *[C] Ti^{3+} [D] V^{3+}

Solution:

$$\text{Magnetic moment } \mu = \sqrt{n(n+2)}\text{ BM}$$

$Cr^{3+} = [Ar] 3d^3$ number of unpaired $e^- = 3$ $Co^{3+} = [Ar] 3d^6$ number of unpaired $e^- = 4$ $Ti^{3+} = [Ar] 3d^1$ number of unpaired $e^- = 1$
 $V^{3+} = [Ar] 3d^2$, number of unpaired $e^- = 2$ \emptyset Least magnetic moment shows by Ti^{3+}

- (95) What is the unit for rate constant for pseudo first order reaction? [GUJCET–2016]
- *[A] $\text{L mol}^{-1} \text{sec}^{-1}$ [B] sec^{-1} [C] $\text{mol lt}^{-1} \text{sec}^{-1}$ [D] $\text{L}^2 \text{mol}^{-2} \text{sec}^{-1}$
- (96) Which solution is filled in salt bridge? [October–2016]
- [A] Solution of dilute CuCl_2 [B] Solution of aqueous copper nitrate [C] Solution of dilute KCl * [D] Solution of aqueous ammonium nitrate.
- (97) What is the IUPAC name of Sodium nitroprusside? [March–2014]
- [A] Sodium penta Cyano nitrosyl ferrate (III) [B] Sodium penta Cyano nitrosonium ferrate (II) * [C] Sodium penta Cyano nitrosyl ferrate (II) [D] Sodium penta Cyano nitrosonium ferrate (II)
- (98) Freezing point of urea solution is -0.6°C . How much urea is required to be dissolved in 3 kg water? $[M(\text{urea}) = 60 \text{ g mol}^{-1}, K_f = 1.5^\circ \text{C Kg mol}]$ [GUJCET–2007]
- [A] 2.4g [B] 3.6g [C] 6.0g * [D] 72 g
- (99) Which of the following is diamagnetic? [October 2014]
- [A] Fe^{2+} * [B] N_2 [C] Cu^{2+} [D] O_2
- (100) Which of the following is aluminium's alloy? [October–2012]
- [A] Steel [B] German Silver * [C] Alnico [D] Delta metal
- (101) Which of the following ore is oxide ore? [October–2016]
- [A] Malachite * [B] Cuprite [C] Calamine [D] Zinc blends
- Solution:** (a) Malachite: $\text{CuCO}_3 \cdot \text{Cu}(\text{OH})_2$ (b) Cuprite: Cu_2O Oxide (c) Calamine: ZnCO_3 (d) Zinc blende: ZnS
- (102) Which of the following complex does not show geometrical isomer? [GUJCET–2007]
- * [A] $[\text{Cr}(\text{OX})_3]^{3-}$ [B] $[\text{Co}(\text{NH}_3)_3(\text{NO}_2)_3]$ [C] $[\text{Co}(\text{NH}_3)_4\text{Cl}_2]^+$ [D] $[\text{Fe}(\text{NH}_3)_2(\text{CN})_4]^-$
- (103) In which of the following solid substance dispersion forces exist? [2019]
- [A] SiO_2 [B] H_2O * [C] CO_2 [D] SO_2
- (104) The limiting molar conductivities of KCl, NaCl and KNO_3 are 150, 126 and $109 \text{ S cm}^2 \text{mol}^{-1}$ respectively. What is the limiting molar conductivity of NaNO_3 ? [October–2013]
- [A] $385 \text{ S cm}^2 \text{mol}^{-1}$ [B] $167 \text{ S cm}^2 \text{mol}^{-1}$ * [C] $85 \text{ S cm}^2 \text{mol}^{-1}$ [D] $133 \text{ S cm}^2 \text{mol}^{-1}$
- (105) Which of the following is the correct order for strength of C – X bond. [GUJCET–2014]
- * [A] $\text{CH}_3\text{F} > \text{CH}_3\text{Cl} > \text{CH}_3\text{Br} > \text{CH}_3\text{I}$ [B] $\text{CH}_3\text{F} < \text{CH}_3\text{Cl} < \text{CH}_3\text{Br} < \text{CH}_3\text{I}$ [C] $\text{CH}_3\text{I} > \text{CH}_3\text{F} > \text{CH}_3\text{Cl} > \text{CH}_3\text{Br}$ [D] $\text{CH}_3\text{Cl} > \text{CH}_3\text{Br} > \text{CH}_3\text{F} > \text{CH}_3\text{I}$
- (106) What is the SI unit of specific conductivity? [October–2016]
- [A] Sm^2 [B] Sm^{-2} * [C] Sm^{-1} [D] Sm^3
- Solution:** Specific conductivity

$$= \frac{1}{\text{resistivity}}$$

$$= \text{conductivity } (\alpha) \times \text{cell constant}$$
 SI unit of conduction is Siemens (S). \emptyset So, SI unit of specific conductivity is Sm^{-1} or Scm^{-1} .
- (107) Calculate cell potential of electrochemical cell made up of Cr and Na. [October–2013]
- $E_{\text{Cr}^{3+}/\text{Cr}}^\circ = -0.74 \text{ V}, E_{\text{Na}^+/\text{Na}}^\circ = 2.71 \text{ V}$
- [A] 3.45 V [B] -1.97 V [C] -3.45 V * [D] 1.97 V
- Solution:**
 $E_{\text{Cr}^{3+}/\text{Cr}}^\circ = -0.74 \text{ V}, E_{\text{Na}^+/\text{Na}}^\circ = -2.71 \text{ V}$

$$E_{\text{cell}}^\circ = E_{\text{red}(\text{cathode})}^\circ - E_{\text{red}(\text{anode})}^\circ$$

$$= -0.74 + 2.71 = 1.97 \text{ V}$$
- (108) Which of the following is the formula of Thionyl chloride? [October–2014]
- [A] SO_2Cl [B] SOCl [C] SO_2Cl_2 * [D] SOCl_2
- (109) For the given reaction, find the order of the reaction with respect to $[\text{H}^+]$ [March–2016]
- $$5\text{Br}^-_{(\text{aq})} + \text{BrO}_3^-_{(\text{aq})} \xrightarrow{\text{H}^+} 3\text{Br}_{2(\text{aq})} + 3\text{H}_2\text{O}_{(\text{l})}$$
- [A] 3 * [B] 2 [C] 1 [D] 4
- (110) Which of the following Langmuir adsorption isotherm will apply at high pressure? [March–2018]
- [A] (a) $\frac{x}{m} = ap$ [B] (b) $\frac{x}{m} = \frac{b}{a}$ [C] (c) $\frac{x}{m} = \frac{1}{ap}$ * [D] (d) $\frac{x}{m} = \frac{a}{b}$
- (111) Which method is used to determine the molecular mass of polymer molecules like colloid? [March–2016]
- [A] Depression in freezing point * [B] Osmotic pressure [C] Decrease in vapour pressure [D] Elevation in boiling point
- (112) Which of the following is not a colligative property? [October–2016]
- [A] Depression in freezing point * [B] Elevation in boiling point [C] Boiling point [D] Relative lowering in vapour pressure

- (113) Based on which two opposite phenomena Langmuir derived adsorption isotherm equation? [March-2013]
 ***[A]** Adsorption and desorption of gas. **[B]** Rate of condensation and rate of evaporation become equal. **[C]** Kinetic theory and collision theory of gases. **[D]** Opposing collision of gaseous molecules.
- (114) Standard reduction potential of x, y and z are 0.75, -0.80 and -0.25 volt respectively. Then which of the following statement is not true? [GUJCET-2016]
[A] Oxidation of y is carried out by x and y. ***[B]** Oxidation of x and reduction of z is carried out by y. **[C]** Reduction of x and oxidation of y is carried out by z. **[D]** Reduction of x is carried out by y and z.
- (115) In elementary reaction: $2\text{SO}_2(\text{g}) + \text{O}_2(\text{g}) \rightarrow \text{product}$. If pressure of SO_2 gas is doubled and pressure of O_2 gas is halved, then what will be the increase in rate of reaction [March-2014]
[A] Sixteen times ***[B]** Two times **[C]** Four times **[D]** Eight times
- (116) What is the number ions are released from aqueous solution of Ferric hex acyano ferate(II)? [March-2009]
[A] 4 **[B]** 5 **[C]** 6 ***[D]** 7
 Solution: $\text{Fe}_4[\text{Fe}(\text{CN})_6]_3 \rightarrow 4\text{Fe}_{(aq)}^{3+} + 3[\text{Fe}(\text{CN})_6]_{(aq)}^{4-}$
- (117) What is the geometrical shape of XeO_3 ? [GUJCET-2014]
[A] Planar triangular ***[B]** Trigonal pyramidal **[C]** Square planar **[D]** Tetrahedral
- (118) Which is correct relation for half life period ($t_{1/2}$) and Initial concentration of reactant $[\text{R}]_0$ for fourth order reaction. [March-2017]
[A] $t_{1/2} \propto \frac{1}{[\text{R}]_0^{-3}}$ **[B]** $t_{1/2} \propto \frac{1}{[\text{R}]_0}$ ***[C]** $t_{1/2} \propto \frac{1}{[\text{R}]_0^3}$ **[D]** $t_{1/2} \propto [\text{R}]_0$
- (119) The value of $\frac{x}{m}$ does not increase rapidly with the increase in the value of p in Freundlich adsorption isotherm because.... [March-2008]
[A] $n < 1$ **[B]** $n = 0$ **[C]** $n - 1 = 0$ ***[D]** $n > 1$
- (120) Fusion enthalpy of solid KCl is [October 2016]
[A] Not definite and not characteristic **[B]** Not definite and characteristic **[C]** Definite and not characteristic ***[D]** Definite and characteristic