

Chemistry One Mark Test

Choose the most suitable answer from the given four alternatives and write the option code and the corresponding answer. 1 x 100 = 100

- Equal volumes of three acid solutions of pH 1, 2 and 3 are mixed in a vessel. What will be the H^+ ion concentration in the mixture?
 - 10^{-6}
 - 3.7×10^{-2}
 - 0.111
 - none of these
- Duralumin is an alloy of
 - Al, Cu, Mn, Mg
 - Cu, Al, Mg
 - Al, Mn
 - Cu, Mn
- Ethyne + $H_2O \xrightarrow{HgSO_4 / H_2SO_4} ?$
 - Propanol
 - Ethanol
 - Ethanal
 - Propanal
- The crystal with a metal deficiency defect is
 - NaCl
 - ZnO
 - FeO
 - KCl
- The incorrect statement among the following is
 - Nickel is refined by Mond's process
 - Titanium is refined by Van Arkel's process
 - Zinc blende is concentrated by froth floatation
 - In the metallurgy of gold, the metal is leached with dilute sodium chloride solution
- _____ is used for producing smoke screen.
 - PH_3
 - PCl_5
 - PCl_3
 - H_3PO_3
- Cell equation : $A + 2B^+ \rightarrow A^{2+} + 2B$; $A^{2+} + 2e^- \rightarrow A$ $E^0 = +0.34 V$ and $\log K = 15.6$ at 300K for cell reactions find E^0 for $B^+ + e^- \rightarrow B$
 - 0.54
 - 1.26
 - 0.80
 - 10.94
- Complete hydrolysis of cellulose gives
 - L-Glucose
 - D-Glucose
 - D-Ribose
 - D-Fructose
- The actinoid elements which show the highest oxidation state of +7 are
 - U, Fm, Th
 - Np, Pu, Am
 - U, Th, Md
 - Es, No, Lr
- _____ is used as insulation for cable, making toys ;
 - Nylon - 6
 - Teflon
 - Orlon
 - polythene
- Crystal field stabilization energy for high spin d^5 octahedral complex is
 - $-0.6\Delta_0$
 - $2(P - \Delta_0)$
 - 0
 - $2(P + \Delta_0)$
- What is the activation energy for a reaction if its rate doubles when the temperature is raised from 200K to 400K? ($R = 8.314 JK^{-1}mol^{-1}$)
 - $234.65 kJ mol^{-1}K^{-1}$
 - $434.65 J mol^{-1}$
 - $434.65 kJ mol^{-1}K^{-1}$
 - $334.65 J mol^{-1}K^{-1}$
- _____ used as packing materials for food items.
 - Au
 - Zn
 - Fe
 - Al
- In the reaction sequence, Ethene \xrightarrow{HOCl} A \xrightarrow{X} ethan -1,2-diol. A and X respectively are
 - Chloroethane and NaOH
 - ethanol and H_2SO_4
 - ethanol and H_2O
 - 2-chloroethan -1-ol and $NaHCO_3$
- Which one of the following nitro compounds does not react with nitrous acid
 - $(CH_3)_3CNO_2$
 - $(CH_3)_2CH_2-CH_2NO_2$
 - $CH_3-CH_2-CH_2-NO_2$
 - $CH_3-C(=O)-CH_3-NO_2$
- Number of Octahedral voids is equal to _____. When the number of close packed spheres be 'n'
 - 2n
 - n
 - $2n^2$
 - $2n^3$
- On hydrolysis, PCl_3 gives
 - $POCl_3$
 - PH_3
 - H_3PO_4
 - H_3PO_3

18. The molar conductivity of a 0.5 mol dm^{-3} solution of AgNO_3 with electrolytic conductivity of $5.76 \times 10^{-3} \text{ S cm}^{-1}$ at 298 K is

- a) $11.52 \text{ S cm}^2 \text{ mol}^{-1}$ b) $2.88 \text{ S cm}^2 \text{ mol}^{-1}$ c) $0.086 \text{ S cm}^2 \text{ mol}^{-1}$ d) $28.8 \text{ S cm}^2 \text{ mol}^{-1}$

19. In the reaction $\text{Ethanol} \xrightarrow{\text{PCl}_5} \text{X} \xrightarrow{\text{alc.KOH}} \text{Y} \xrightarrow{\text{H}_2\text{SO}_4/\text{H}_2\text{O}-298\text{K}} \text{Z}$. The 'Z' is

- a) ethanol b) ethoxyethane c) ethylbisulphite d) ethane

20. General electronic outer configuration of Group 14 elements is

- a) $ns^2 np^1$ b) $ns^2 np^3$ c) $ns^2 np^2$ d) $ns^2 np^4$

21. Fac-mer isomerism is shown by

- a) $[\text{Co}(\text{en})_3]^{3+}$ b) $[\text{Co}(\text{NH}_3)_4\text{Cl}_2]^+$ c) $[\text{Co}(\text{NH}_3)_5\text{Cl}]\text{SO}_4$ d) $[\text{Co}(\text{NH}_3)_3\text{Cl}_3]$

22. The coagulation values in millimoles per litre of the electrolytes used for the coagulation of As_2S_3 are given below

- (I) $(\text{NaCl})=52$ (II) $(\text{BaCl}_2)=0.69$ (III) $(\text{MgSO}_4)=0.22$

The correct order of their coagulating power is

- a) $\text{III} > \text{II} > \text{I}$ b) $\text{I} > \text{II} > \text{III}$ c) $\text{I} > \text{III} > \text{II}$ d) $\text{II} > \text{III} > \text{I}$

23. When Glycerol is oxidized by Fenton's reagent _____ is produced.

- a) Tartronic acid b) Glyceric acid c) Glycerose d) Meso oxalic acid

24. The solubility of BaSO_4 in water is $2.42 \times 10^{-3} \text{ g L}^{-1}$ at 298K. The value of its solubility product (K_{sp}) will be (Given molar mass of $\text{BaSO}_4 = 233 \text{ g mol}^{-1}$)

- a) $1.08 \times 10^{-14} \text{ mol}^2 \text{ L}^{-2}$ b) $1.08 \times 10^{-12} \text{ mol}^2 \text{ L}^{-2}$ c) $1.08 \times 10^{-10} \text{ mol}^2 \text{ L}^{-2}$ d) $1.08 \times 10^{-8} \text{ mol}^2 \text{ L}^{-2}$

25. Hair cream is

- a) gel b) emulsion c) solid sol d) sol.

26. Identify oxidation number of Ni in $[\text{Ni}(\text{CO})_4]$

- a) 2 b) 0 c) 4 d) 3

27. In a reversible reaction, the enthalpy change and the activation energy in the forward direction are respectively $-x \text{ kJ mol}^{-1}$ and $y \text{ kJ mol}^{-1}$. Therefore, the energy of activation in the backward direction is

- a) $(x + y) \times 10^3 \text{ J mol}^{-1}$ b) $(y + x) \text{ J mol}^{-1}$ c) $(x - y) \text{ kJ mol}^{-1}$ d) $(y - x) \text{ kJ mol}^{-1}$

28. The basicity of pyrophosphorous acid ($\text{H}_4\text{P}_2\text{O}_5$) is

- a) 4 b) 3 c) 2 d) 5

29. Which of the following represents the correct order of acidity in the given compounds

- a) $\text{FCH}_2\text{COOH} > \text{CH}_3\text{COOH} > \text{BrCH}_2\text{COOH} > \text{ClCH}_2\text{COOH}$
 b) $\text{CH}_3\text{COOH} > \text{ClCH}_2\text{COOH} > \text{FCH}_2\text{COOH} > \text{Br-CH}_2\text{COOH}$
 c) $\text{FCH}_2\text{COOH} > \text{ClCH}_2\text{COOH} > \text{BrCH}_2\text{COOH} > \text{CH}_3\text{COOH}$
 d) $\text{ClCH}_2\text{COOH} > \text{CH}_3\text{COOH} > \text{BrCH}_2\text{COOH} > \text{ICH}_2\text{COOH}$

30. In Glucose Anomers differ only in the configuration of _____ carbon.

- a) C-5 b) C-2 c) C-4 d) C-1

31. The magnetic moment of Mn^{2+} ion is

- a) 5.92 BM b) 2.80 BM c) 8.95 BM d) 3.90 BM

32. For a first order reaction $\text{A} \rightarrow \text{B}$ the rate constant is $x \text{ min}^{-1}$. If the initial concentration of A is 0.01 M, the concentration of A after one hour is given by the expression.

- a) $0.01 e^{-x}$ b) $1 \times 10^{-2} (1 - e^{-60x})$ c) $(1 \times 10^{-2}) e^{-60x}$ d) none of these

33. Among the d-block elements which one exhibit highest oxidation state.

- a) Zn b) Ru c) Au d) Cu

34. pH of a saturated solution of $\text{Ca}(\text{OH})_2$ is 9. The Solubility product (K_{sp}) of $\text{Ca}(\text{OH})_2$

- a) 0.5×10^{-15} b) 0.5×10^{-15} c) 0.125×10^{-15} d) 0.5×10^{-10}

35. Drugs that bind to the receptor site and inhibit its natural function are called

- a) molecular targets b) agonists c) enzymes d) antagonists

36. Which of the following is more basic :

- a) 3° amine b) 1° amine c) 2° amine d) NH_3

37. Conductivity of a saturated solution of a sparingly soluble salt AB (1:1 electrolyte) at 298K is $1.85 \times 10^{-5} \text{ S m}^{-1}$. Solubility product of the salt AB at 298K (Λ_m^0)_{AB} = $14 \times 10^{-3} \text{ Sm}^2 \text{ mol}^{-1}$.

- a) 5.7×10^{-12} b) 1.74×10^{-12} c) 7.5×10^{-12} d) 1.32×10^{-12}

38. In the decomposition of Hydrogen peroxide _____ act as a negative catalyst.
 a) Ethanol b) Pt c) H₂S d) glycerol
39. _____ is used as preservative for pickles.
 a) methanol b) ethanol c) methanoic acid d) ethanoic acid
40. Which among the following is not a borane?
 a) B₃H₆ b) B₂H₆ c) B₄H₁₀ d) none of these
41. A complex in which the oxidation number of the metal is zero is
 a) K₄[Fe(CN)₆] b) [Fe(CO)₅] c) [Fe(CN)₃(NH₃)₃] d) both (b) and (c)
42. Graphite and diamond are
 a) Covalent and molecular crystals b) ionic and covalent crystals
 c) both molecular crystals d) both covalent crystals
43. Considering Ellingham diagram, which of the following metals can be used to reduce alumina?
 a) Mg b) Cu c) Fe d) Zn
44. Phenyl methanal is reacted with concentrated NaOH to give two products X and Y. X reacts with metallic sodium to liberate hydrogen X and Y are
 a) phenyl methanol and sodium benzoate b) Sodium benzoate and phenyl methanol
 c) sodium benzoate and phenol d) none of these
45. For the reaction, 2NH₃ → N₂ + 3H₂, if $\frac{-d[\text{NH}_3]}{dt} = k_1[\text{NH}_3]$, $\frac{+d[\text{N}_2]}{dt} = k_2[\text{NH}_3]$, $\frac{+d[\text{H}_2]}{dt} = k_3[\text{NH}_3]$ then the relation between K₁, K₂ and k₃ is
 a) K₁ = K₂ = K₃ b) K₁ = 3K₂ = 2K₃ c) 1.5K₁ = 3K₂ = K₃ d) 2K₁ = K₂ = 3K₃
46. Among the following which is Conjugate base of H₂CO₃.
 a) CO₂ b) CO₃²⁻ c) H₃CO₃⁺ d) HCO₃⁻
47. Among the following, which is the strongest oxidizing agent?
 a) F₂ b) Cl₂ c) Br₂ d) I₂
48. Coordination number of ZnS is :
 a) 3 b) 6 c) 4 d) 8
49. Non stick cook wares generally have a coating of a polymer, whose monomer is
 a) ethane b) prop-2-enitrile c) Teflon d) chloroethene
50. The formation of cyanohydrin from acetone is an example of
 a) nucleophilic substitution b) Nucleophilic addition
 c) electrophilic addition d) electrophilic substitution
51. The basic structural unit of silicates is
 a) (SiO₃)²⁻ b) (SiO₄)⁴⁻ c) (SiO)⁻ d) (SiO₄)²⁻
52. Assertion : Coagulation power of Al³⁺ is more than Na⁺.
 Reason : greater the valency of the flocculating ion added, greater is its power to cause precipitation
 a) if both assertion and reason are true and reason is the correct explanation of assertion.
 b) if both assertion and reason are true but reason is not the correct explanation of assertion.
 c) assertion is true but reason is false d) both assertion and reason are false
53. Which of following condition is suitable for super saturated solution with precipitation occur.
 a) Ionic product = K_{sp} b) Ionic product < K_{sp}
 c) Ionic product > K_{sp} d) Ionic product ≥ K_{sp}
54. In H₂ - O₂ fuel cell the reaction occurs at cathode is
 a) 2H_{2(g)} + O_{2(g)} → 2H_{2O (g)} b) H⁺_(aq) + OH⁻_(aq) → H_{2O(l)}
 c) O_{2(g)} + 2H_{2O (l)} + 4e⁻ → 4OH⁻_(aq) d) H⁺ + e⁻ → 1/2 H₂
55. easily liquefiable gas is
 a) Ar b) Ne c) Kr d) He

56. Which of the following pair is correct for square planer complex (coordination number and hybridization)
- a) 4 & dsp^2 b) 3 & sp^2 c) 4 & sp^3 d) 2 & sp
57. Collodion is a 4% solution of which one of the following compounds in alcohol – ether mixture?
- a) Nitroglycerine b) Cellulose acetate c) Nitrocellulose d) Glycol dinitrate
58. If the solubility product of lead iodide is 3.2×10^{-8} , its solubility will be
- a) $4 \times 10^{-4}M$ b) $2 \times 10^{-3}M$ c) $1.6 \times 10^{-5}M$ d) $1.8 \times 10^{-5}M$
59. Nylon is an example of
- a) polythene b) polyamide c) polyester d) poly saccharide
60. _____ used as a fuel for cars.
- a) Chloropicrin b) Nitro ethane c) Nitro benzene d) Nitro methane
61. The yellow colour in NaCl crystal is due to
- a) refraction of light from Na^+ ion b) reflection of light from Cl^- ion on the surface
c) excitation of electrons in F centers d) all of the above
62. Which one of the following reaction represents calcinations?
- a) $2Zn + O_2 \rightarrow 2ZnO$ b) $MgCO_3 \rightarrow MgO + CO_2$
c) $2ZnS + 3O_2 \rightarrow 2ZnO + 2SO_2$ d) Both (a) and (c)
63. Colour of U^{3+} ion is :
- a) Yellow b) Green c) Blue d) Red
64. The most effective electrolyte for the coagulation of As_2S_3 is
- a) NaCl b) $Ba(NO_3)_2$ c) $K_3[Fe(CN)_6]$ d) $Al_2(SO_4)_3$
65. $HO-CH_2-CH_2-OH$ on heating with periodic acid gives
- a) methanal b) Glyoxal c) methanoic acid d) CO_2
66. Which of the following reagent can be used to convert nitrobenzene to aniline
- a) $Zn/Hg / NaOH$ b) Sn / HCl c) $LiAlH_4$ d) All of these
67. Potassium has a bcc structure with nearest neighbor distance 4.52 \AA . its atomic weight is 39 g mol^{-1} . its density will be
- a) 390 kg m^{-3} b) 2142 kg m^{-3} c) 452 kg m^{-3} d) 915 kg m^{-3}
68. In a protein, various amino acids linked together by
- a) Peptide bond b) Dative bond c) α - Glycosidic bond d) β - Glycosidic bond
69. Formula of tris(ethane-1,2-diamine)iron(II) phosphate
- a) $[Fe(H_2N-CH_2-CH_2-NH_2)_3]_3(PO_4)_2$ b) $[Fe(H_2N-CH_2-CH_2-NH_2)_3]PO_4$
c) $[Fe(H_2N-CH_2-CH_2-NH_2)_3](PO_4)_2$ d) $[Fe(CH_3-CH(NH_2)_2)_3](PO_4)_3$
70. Vitamin C is known as
- a) Riboflavin b) Thiamine c) Ascorbic acid d) Pyridoxine
71. The vacant space in bcc lattice unit cell is
- a) 48% b) 23% c) 26% d) 32%
72. Isopropylbenzene on air oxidation in the presence of dilute acid gives
- a) C_6H_5-OH b) $C_6H_5-CO-CH_3$ c) $C_6H_5-CO-C_6H_5$ d) C_6H_5-COOH
73. Which of the following metal does not acts as Sacrificial anode for Iron (Fe) :
- a) Li b) Mg c) Pb d) Zn
74. Assertion: rate of reaction doubles when the concentration of the reactant is doubles if it is a first order reaction.
Reason: rate constant also doubles
- a) Both assertion and reason are true and reason is the correct explanation of assertion.
b) Both assertion and reason are true but reason is not the correct explanation of assertion.
c) Assertion is true but reason is false. d) Both assertion and reason are false

- 75.** How many moles of I_2 are liberated when 1 mole of potassium dichromate react with potassium iodide?
 a) 1 b) 3 c) 2 d) 4
- 76.** Formalin is a _____ aqueous solution of Formaldehyde.
 a) 30 % b) 40 % c) 20 % d) 10 %
- 77.** Insulin, a hormone chemically is
 a) Protein b) Steroid c) Fat d) Carbohydrates
- 78.** Permanganate ion changes to _____ in acidic medium
 a) MnO_4^{2-} b) Mn^{3+} c) Mn^{2+} d) MnO_2
- 79.** The polymer used in making blankets (artificial wool) is
 a) polystyrene b) polyester c) PAN d) polythene
- 80.** Which of the following method used to refining for metal based on melting point.
 a) Zone refining b) Liquefaction c) Electric refining d) Distillation
- 81.** Which will make basic buffer?
 a) 100 mL of 0.1M HCl + 200 mL of 0.1M NH_4OH
 b) 100 mL of 0.1M CH_3COOH + 100 mL of 0.1M NH_4OH
 c) 50 mL of 0.1M NaOH + 25 mL of 0.1M CH_3COOH
 d) 100 mL of 0.1M HCl + 100 mL of 0.1M NaOH
- 82.** A current strength of 3.86 A was passed through molten Calcium oxide for 41 minutes and 40 seconds. The mass of Calcium in grams deposited at the cathode is (atomic mass of Ca is 40g/mol and $1F = 96500C$).
 a) 4 b) 8 c) 2 d) 6
- 83.** Among the following produce cross linked silicones by hydrolysis
 a) $SiCl_4$ b) R_2SiCl_2 c) $RSiCl_3$ d) R_3SiCl
- 84.** $C_6H_5NO_2 \xrightarrow{Fe/HCl}$ A $\xrightarrow{NaNO_2/HCl/273K}$ B $\xrightarrow{H_2O/283K}$ C 'C' is
 a) $C_6H_5-CH_2-OH$ b) C_6H_5-OH c) C_6H_5-CHO d) $C_6H_5-NH_2$
- 85.** Which one of the following is a bio-degradable polymer?
 a) HDPE b) PVC c) Nylon 6 d) PHBV
- 86.** Acetone reacts with Grignard reagent forms :
 a) Primary alcohol b) Secondary alcohol c) Tertiary alcohol d) Methanol
- 87.** Which of the metal is extracted by Hall-Heroult process?
 a) Ni b) Al c) Cu d) Zn
- 88.** Which one of the following will not undergo Hofmann bromamide reaction
 a) $C_6H_5CONH_2$ b) $CH_3CH_2CONH_2$ c) CH_3CONH_2 d) $CH_3CONHCH_3$
- 89.** $(CH_3)_3C-CH(OH)-CH_3 \xrightarrow{con\ H_2SO_4} X$ (major product)
 a) $(CH_3)CCH=CH_2$ b) $CH_2=C(CH_3)-CH_2-CH_2-CH_3$
 c) $CH_2=C(CH_3)CH_2-CH_2-CH_3$ d) $(CH_3)_2C=C(CH_3)_2$
- 90.** If activation energy increases, the rate of reaction will be
 a) Decreases b) Increases c) No change d) First increases then decreases
- 91.** Oxidation state of carbon in its hydrides
 a) -4 b) +4 c) +3 d) +2
- 92.** Among the following the achiral amino acid is
 a) 2-ethylalanine b) 2-methylglycine c) Tryptophan d) 2-hydroxymethylserine
- 93.** Hybridisation of AX_5 type of Interhalogen Compound is
 a) sp^3d^2 b) sp^3d c) sp^3 d) sp^3d^3
- 94.** Assertion : Molar conductance of a solution increases with increase in dilution
 Reason : For a strong electrolyte inter ionic forces of attraction decreases with dilution.
 a) if both assertion and reason are true and reason is the correct explanation of assertion.
 b) if both assertion and reason are true but reason is not the correct explanation of assertion.
 c) assertion is true but reason is false d) both assertion and reason are false

95. $\text{CH}_2 = \text{CH}_2 \xrightarrow[\text{ii) Zn / H}_2\text{O}]{\text{i) O}_3} \text{X} \xrightarrow{\text{NH}_3} \text{Y}$, 'Y' is
- a) Formaldelyde b) di acetone ammonia c) hexamethylene tetraamine d) oxime
96. Cheese is an example of
- a) solid in solid b) solid in liquid c) liquid in liquid d) liquid in solid
97. $\text{CH}_3\text{Br} \xrightarrow{\text{KCN}} \text{(A)} \xrightarrow{\text{H}_3\text{O}^+} \text{(B)} \xrightarrow{\text{PCl}_5} \text{(C)}$ product (C) is
- a) acetylchloride b) chloro acetic acid
c) α - chlorocynoethanoic acid d) none of these
98. Ammonium salt of benzoic acid is heated strongly with P_2O_5 and the product so formed is reduced and then treated with NaNO_2/HCl at low temperature. The final compound formed is
- a) Benzene diazonium chloride b) Phenol
c) Benzyl alcohol d) Nitrosobenzene
99. In aqueous solution of amino acids mostly exists in,
- a) $\text{NH}_2\text{-CH(R)-COOH}$ b) $\text{NH}_2\text{-CH(R)-COO}^-$
c) $\text{H}_3\text{N}^+\text{-CH(R)-COO}^-$ d) $\text{H}_3\text{N}^+\text{-CH(R)-COOH}$
100. Photo chemical reaction between H_2 and Cl_2 is an example of
- a) First order b) Zero order c) Pseudo first order d) Second order

SPECIAL TEST – 2023 SIVAGANGAI DT
Chemistry One Mark Test

Type - B

Choose the most suitable answer from the given four alternatives and write the option code and the corresponding answer. 1 x 100 = 100

1. Identify oxidation number of Ni in $[\text{Ni}(\text{CO})_4]$
 - a) 2
 - b) 0
 - c) 4
 - d) 3
2. In a reversible reaction, the enthalpy change and the activation energy in the forward direction are respectively $-x \text{ kJ mol}^{-1}$ and $y \text{ kJ mol}^{-1}$. Therefore, the energy of activation in the backward direction is
 - a) $(x + y) \times 10^3 \text{ J mol}^{-1}$
 - b) $(y + x) \text{ J mol}^{-1}$
 - c) $(x - y) \text{ kJ mol}^{-1}$
 - d) $(y - x) \text{ kJ mol}^{-1}$
3. The basicity of pyrophosphorous acid ($\text{H}_4\text{P}_2\text{O}_5$) is
 - a) 4
 - b) 3
 - c) 2
 - d) 5
4. Which of the following represents the correct order of acidity in the given compounds
 - a) $\text{FCH}_2\text{COOH} > \text{CH}_3\text{COOH} > \text{BrCH}_2\text{COOH} > \text{ClCH}_2\text{COOH}$
 - b) $\text{CH}_3\text{COOH} > \text{ClCH}_2\text{COOH} > \text{FCH}_2\text{COOH} > \text{Br-CH}_2\text{COOH}$
 - c) $\text{FCH}_2\text{COOH} > \text{ClCH}_2\text{COOH} > \text{BrCH}_2\text{COOH} > \text{CH}_3\text{COOH}$
 - d) $\text{ClCH}_2\text{COOH} > \text{CH}_3\text{COOH} > \text{BrCH}_2\text{COOH} > \text{ICH}_2\text{COOH}$
5. In Glucose Anomers differ only in the configuration of _____ carbon.
 - a) C-5
 - b) C-2
 - c) C-4
 - d) C-1
6. The magnetic moment of Mn^{2+} ion is
 - a) 5.92BM
 - b) 2.80BM
 - c) 8.95BM
 - d) 3.90BM
7. For a first order reaction $\text{A} \rightarrow \text{B}$ the rate constant is $x \text{ min}^{-1}$. If the initial concentration of A is 0.01M, the concentration of A after one hour is given by the expression.
 - a) $0.01 e^{-x}$
 - b) $1 \times 10^{-2} (1 - e^{-60x})$
 - c) $(1 \times 10^{-2}) e^{-60x}$
 - d) none of these
8. Among the d-block elements which on exhibit highest oxidation state.
 - a) Zn
 - b) Ru
 - c) Au
 - d) Cu
9. pH of a saturated solution of $\text{Ca}(\text{OH})_2$ is 9. The Solubility product (K_{sp}) of $\text{Ca}(\text{OH})_2$
 - a) 0.5×10^{-15}
 - b) 0.5×10^{-15}
 - c) 0.125×10^{-15}
 - d) 0.5×10^{-10}
10. Drugs that bind to the receptor site and inhibit its natural function are called
 - a) molecular targets
 - b) agonists
 - c) enzymes
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11. Which of the following is more basic :
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 - c) 2^0 amine
 - d) NH_3
12. Conductivity of a saturated solution of a sparingly soluble salt AB (1:1 electrolyte) at 298K is $1.85 \times 10^{-5} \text{ S m}^{-1}$. Solubility product of the salt AB at 298K (Λ_m^0)_{AB} = $14 \times 10^{-3} \text{ Sm}^2 \text{ mol}^{-1}$.
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 - d) 1.32×10^{-12}
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 - b) Pt
 - c) H_2S
 - d) glycerol
14. _____ is used as preservative for pickles.
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 - b) ethanol
 - c) methanoic acid
 - d) ethanoic acid
15. Which among the following is not a borane?
 - a) B_3H_6
 - b) B_2H_6
 - c) B_4H_{10}
 - d) none of these
16. A complex in which the oxidation number of the metal is zero is
 - a) $\text{K}_4[\text{Fe}(\text{CN})_6]$
 - b) $[\text{Fe}(\text{CO})_5]$
 - c) $[\text{Fe}(\text{CN})_3(\text{NH}_3)_3]$
 - d) both (b) and (c)
17. Graphite and diamond are
 - a) Covalent and molecular crystals
 - b) ionic and covalent crystals
 - c) both molecular crystals
 - d) both covalent crystals
18. Considering Ellingham diagram, which of the following metals can be used to reduce alumina?
 - a) Mg
 - b) Cu
 - c) Fe
 - d) Zn

19. Phenyl methanal is reacted with concentrated NaOH to give two products X and Y. X reacts with metallic sodium to liberate hydrogen X and Y are
- a) phenyl methanol and sodium benzoate
b) Sodium benzoate and phenyl methanol
c) sodium benzoate and phenol
d) none of these
20. For the reaction, $2\text{NH}_3 \longrightarrow \text{N}_2 + 3\text{H}_2$, if $\frac{-d[\text{NH}_3]}{dt} = k_1[\text{NH}_3]$, $\frac{+d[\text{N}_2]}{dt} = k_2[\text{NH}_3]$, $\frac{+d[\text{H}_2]}{dt} = k_3[\text{NH}_3]$ then the relation between k_1 , k_2 and k_3 is
- a) $k_1 = k_2 = k_3$
b) $k_1 = 3k_2 = 2k_3$
c) $1.5k_1 = 3k_2 = k_3$
d) $2k_1 = k_2 = 3k_3$
21. Among the following which is Conjugate base of H_2CO_3 .
- a) CO_2
b) CO_3^{2-}
c) H_3CO_3^+
d) HCO_3^-
22. Among the following, which is the strongest oxidizing agent?
- a) F_2
b) Cl_2
c) Br_2
d) I_2
23. Coordination number of ZnS is :
- a) 3
b) 6
c) 4
d) 8
24. Non stick cook wares generally have a coating of a polymer, whose monomer is
- a) ethane
b) prop-2-enenitrile
c) Teflon
d) chloroethene
25. The formation of cyanohydrin from acetone is an example of
- a) nucleophilic substitution
b) Nucleophilic addition
c) electrophilic addition
d) electrophilic substitution
26. Formalin is a _____ aqueous solution of Formaldehyde.
- a) 30 %
b) 40 %
c) 20 %
d) 10 %
27. Insulin, a hormone chemically is
- a) Protein
b) Steroid
c) Fat
d) Carbohydrates
28. Permanganate ion changes to _____ in acidic medium
- a) MnO_4^{2-}
b) Mn^{3+}
c) Mn^{2+}
d) MnO_2
29. The polymer used in making blankets (artificial wool) is
- a) polystyrene
b) polyester
c) PAN
d) polythene
30. Which of the following method used to refining for metal based on melting point.
- a) Zone refining
b) Liquefaction
c) Electric refining
d) Distillation
31. Which will make basic buffer?
- a) 100 mL of 0.1M HCl + 200 mL of 0.1M NH_4OH
b) 100 mL of 0.1M CH_3COOH + 100 mL of 0.1M NH_4OH
c) 50 mL of 0.1M NaOH + 25 mL of 0.1M CH_3COOH
d) 100 mL of 0.1M HCl + 100 mL of 0.1M NaOH
32. A current strength of 3.86 A was passed through molten Calcium oxide for 41 minutes and 40 seconds. The mass of Calcium in grams deposited at the cathode is (atomic mass of Ca is 40g/mol and $1F = 96500C$).
- a) 4
b) 8
c) 2
d) 6
33. Among the following produce cross linked silicones by hydrolysis
- a) SiCl_4
b) R_2SiCl_2
c) RSiCl_3
d) R_3SiCl
34. $\text{C}_6\text{H}_5\text{NO}_2 \xrightarrow{\text{Fe/HCl}} \text{A} \xrightarrow{\text{NaNO}_2/\text{HCl}/273\text{K}} \text{B} \xrightarrow{\text{H}_2\text{O}/283\text{K}} \text{C}'\text{C}'$ is
- a) $\text{C}_6\text{H}_5-\text{CH}_2-\text{OH}$
b) $\text{C}_6\text{H}_5-\text{OH}$
c) $\text{C}_6\text{H}_5-\text{CHO}$
d) $\text{C}_6\text{H}_5-\text{NH}_2$
35. Which one of the following is a bio-degradable polymer?
- a) HDPE
b) PVC
c) Nylon 6
d) PHBV
36. Acetone reacts with Grignard reagent forms :
- a) Primary alcohol
b) Secondary alcohol
c) Tertiary alcohol
d) Methanol
37. Which of the metal is extracted by Hall-Heroult process?
- a) Ni
b) Al
c) Cu
d) Zn
38. Which one of the following will not undergo Hofmann bromamide reaction
- a) $\text{C}_6\text{H}_5\text{CONH}_2$
b) $\text{CH}_3\text{CH}_2\text{CONH}_2$
c) CH_3CONH_2
d) $\text{CH}_3\text{CONHCH}_3$

39. $(\text{CH}_3)_3\text{C}-\text{CH}(\text{OH})-\text{CH}_3 \xrightarrow{\text{con H}_2\text{SO}_4} \text{X}$ (major product)
 a) $(\text{CH}_3)\text{CCH}=\text{CH}_2$ b) $\text{CH}_2=\text{C}(\text{CH}_3)-\text{CH}_2-\text{CH}_2-\text{CH}_3$
 c) $\text{CH}_2=\text{C}(\text{CH}_3)\text{CH}_2-\text{CH}_2-\text{CH}_3$ d) $(\text{CH}_3)_2\text{C}=\text{C}(\text{CH}_3)_2$
40. If activation energy increases, the rate of reaction will be
 a) Decreases b) Increases c) No change d) First increases then decreases
41. Oxidation state of carbon in its hydrides
 a) -4 b) +4 c) +3 d) +2
42. Among the following the achiral amino acid is
 a) 2-ethylalanine b) 2-methylglycine c) Tryptophan d) 2-hydroxymethylserine
43. Hybridisation of AX_5 type of Interhalogen Compound is
 a) sp^3d^2 b) sp^3d c) sp^3 d) sp^3d^3
44. Assertion : Molar conductance of a solution increases with increases in dilution
 Reason : For a strong electrolyte inter ionic forces of attraction decreases with dilution.
 a) if both assertion and reason are true and reason is the correct explanation of assertion.
 b) if both assertion and reason are true but reason is not the correct explanation of assertion.
 c) assertion is true but reason is false d) both assertion and reason are false
45. $\text{CH}_2=\text{CH}_2 \xrightarrow[\text{ii) Zn / H}_2\text{O}]{\text{i) O}_3} \text{X} \xrightarrow{\text{NH}_3} \text{Y}$, 'Y' is
 a) Formaldelyde b) di acetone ammonia c) hexamethylene tetraamine d) oxime
46. Cheese is an example of
 a) solid in solid b) solid in liquid c) liquid in liquid d) liquid in solid
47. $\text{CH}_3\text{Br} \xrightarrow{\text{KCN}} \text{(A)} \xrightarrow{\text{H}_3\text{O}^+} \text{(B)} \xrightarrow{\text{PCl}_5} \text{(C)}$ product (C) is
 a) acetylchloride b) chloro acetic acid
 c) α - chlorocynoethanoic acid d) none of these
48. Ammonium salt of benzoic acid is heated strongly with P_2O_5 and the product so formed is reduced and then treated with NaNO_2/HCl at low temperature. The final compound formed is
 a) Benzene diazonium chloride b) Phenol
 c) Benzyl alcohol d) Nitrosobenzene
49. In aqueous solution of amino acids mostly exists in,
 a) $\text{NH}_2-\text{CH}(\text{R})-\text{COOH}$ b) $\text{NH}_2-\text{CH}(\text{R})-\text{COO}^-$
 c) $\text{H}_3\text{N}^+-\text{CH}(\text{R})-\text{COO}^-$ d) $\text{H}_3\text{N}^+-\text{CH}(\text{R})-\text{COOH}$
50. Photo chemical reaction between H_2 and Cl_2 is an example of
 a) First order b) Zero order c) Pseudo first order d) Second order
51. Equal volumes of three acid solutions of pH 1,2 and 3 are mixed in a vessel. What will be the H^+ ion concentration in the mixture?
 a) 10^{-6} b) 3.7×10^{-2} c) 0.111 d) none of these
52. Duralumin is an alloy of
 a) Al,Cu,Mn,Mg b) Cu,Al,Mg c) Al,Mn d) Cu,Mn
53. Ethyne + $\text{H}_2\text{O} \xrightarrow{\text{HgSO}_4 / \text{H}_2\text{SO}_4} ?$
 a) Propanol b) Ethanol c) Ethanal d) Propanal
54. The crystal with a metal deficiency defect is
 a) NaCl b) ZnO c) FeO d) KCl
55. The incorrect statement among the following is
 a) Nickel is refined by Mond's process b) Titanium is refined by Van Arkel's process
 c) Zinc blende is concentrated by froth floatation
 d) In the metallurgy of gold, the metal is leached with dilute sodium chloride solution
56. _____ is used for producing smoke screen.
 a) PH_3 b) PCl_5 c) PCl_3 d) H_3PO_3

57. Cell equation : $A + 2B^- \rightarrow A^{2+} + 2B$; $A^{2+} + 2e^- \rightarrow A$ $E^0 = +0.34$ V and $\log K = 15.6$ at 300K for cell reactions find E^0 for $B^+ + e^- \rightarrow B$
- a) -0.54 b) 1.26 c) 0.80 d) -10.94
58. Complete hydrolysis of cellulose gives
- a) L-Glucose b) D-Glucose c) D-Ribose d) D-Fructose
59. The actinoid elements which show the highest oxidation state of +7 are
- a) U, Fm, Th b) Np, Pu, Am c) U, Th, Md d) Es, No, Lr
60. _____ is used as insulation for cable, making toys ;
- a) Nylon - 6 b) Teflon c) Orlon d) polythene
61. Crystal field stabilization energy for high spin d^5 octahedral complex is
- a) $-0.6\Delta_0$. b) $2(P - \Delta_0)$ c) 0 d) $2(P + \Delta_0)$
62. What is the activation energy for a reaction if its rate doubles when the temperature is raised from 200K to 400K? ($R = 8.314 \text{ JK}^{-1}\text{mol}^{-1}$)
- a) $234.65 \text{ kJ mol}^{-1}\text{K}^{-1}$ b) $434.65 \text{ J mol}^{-1}$ c) $434.65 \text{ kJ mol}^{-1}\text{K}^{-1}$ d) $334.65 \text{ J mol}^{-1}\text{K}^{-1}$
63. _____ used as packing materials for food items.
- a) Au b) Zn c) Fe d) Al
64. In the reaction sequence, Ethene $\xrightarrow{\text{HOCl}}$ A $\xrightarrow{\text{X}}$ ethan -1,2-diol. A and X respectively are
- a) Chloroethane and NaOH b) ethanol and H_2SO_4
c) ethanol and H_2O d) 2-chloroethan -1-ol and NaHCO_3
65. Which one of the following nitro compounds does not react with nitrous acid
- a) $(\text{CH}_3)_3\text{CNO}_2$ b) $(\text{CH}_3)_2\text{CH}_2\text{-CH}_2\text{NO}_2$
c) $\text{CH}_3\text{-CH}_2\text{-CH}_2\text{-NO}_2$ d) $\text{CH}_3\text{-C} \begin{array}{l} \parallel \\ \text{O} \end{array} \text{-CHNO}_2$
66. Number of Octahedral voids is equal to _____. When the number of close packed spheres be 'n'
- a) $2n$ b) n c) $2n^2$ d) $2n^3$
67. On hydrolysis, PCl_3 gives
- a) POCl_3 b) PH_3 c) H_3PO_4 d) H_3PO_3
68. The molar conductivity of a 0.5 mol dm^{-3} solution of AgNO_3 with electrolytic conductivity of $5.76 \times 10^{-3} \text{ S cm}^{-1}$ at 298 K is
- a) $11.52 \text{ S cm}^2\text{mol}^{-1}$ b) $2.88 \text{ S cm}^2\text{mol}^{-1}$ c) $0.086 \text{ S cm}^2\text{mol}^{-1}$ d) $28.8 \text{ S cm}^2\text{mol}^{-1}$
69. In the reaction Ethanol $\xrightarrow{\text{PCl}_5}$ X $\xrightarrow{\text{alc.KOH}}$ Y $\xrightarrow{\text{H}_2\text{SO}_4/\text{H}_2\text{O}-298\text{K}}$ Z. The 'Z' is
- a) ethanol b) ethoxyethane c) ethylbisulphite d) ethane
70. General electronic outer configuration of Group 14 elements is
- a) ns^2np^1 b) ns^2np^3 c) ns^2np^2 d) ns^2np^4
71. Fac-mer isomerism is shown by
- a) $[\text{Co}(\text{en})_3]^{3+}$ b) $[\text{Co}(\text{NH}_3)_4\text{Cl}_2]^+$ c) $[\text{Co}(\text{NH}_3)_5\text{Cl}]\text{SO}_4$ d) $[\text{Co}(\text{NH}_3)_3\text{Cl}_3]$
72. The coagulation values in millimoles per litre of the electrolytes used for the coagulation of As_2S_3 are given below
- (I) $(\text{NaCl})=52$ (II) $(\text{BaCl}_2)=0.69$ (III) $(\text{MgSO}_4)=0.22$
- The correct order of their coagulating power is
- a) $\text{III} > \text{II} > \text{I}$ b) $\text{I} > \text{II} > \text{III}$ c) $\text{I} > \text{III} > \text{II}$ d) $\text{II} > \text{III} > \text{I}$
73. When Glycerol is oxidized by Fenton's reagent _____ is produced.
- a) Tartaric acid b) Glyceric acid c) Glycerose d) Meso oxalic acid
74. The solubility of BaSO_4 in water is $2.42 \times 10^{-3} \text{ gL}^{-1}$ at 298K. The value of its solubility product (K_{sp}) will be (Given molar mass of $\text{BaSO}_4 = 233 \text{ g mol}^{-1}$)
- a) $1.08 \times 10^{-14} \text{ mol}^2\text{L}^{-2}$ b) $1.08 \times 10^{-12} \text{ mol}^2\text{L}^{-2}$ c) $1.08 \times 10^{-10} \text{ mol}^2\text{L}^{-2}$ d) $1.08 \times 10^{-8} \text{ mol}^2\text{L}^{-2}$
75. Hair cream is
- a) gel b) emulsion c) solid sol d) sol.

76. The basic structural unit of silicates is

- a) $(\text{SiO}_3)^{2-}$ b) $(\text{SiO}_4)^{4-}$ c) $(\text{SiO})^-$ d) $(\text{SiO}_4)^{2-}$

77. Assertion : Coagulation power of Al^{3+} is more than Na^+ .

Reason : greater the valency of the flocculating ion added, greater is its power to cause precipitation

- a) if both assertion and reason are true and reason is the correct explanation of assertion.
 b) if both assertion and reason are true but reason is not the correct explanation of assertion.
 c) assertion is true but reason is false d) both assertion and reason are false

78. Which of following condition is suitable for super saturated solution with precipitation occur.

- a) Ionic product = K_{sp} b) Ionic product < K_{sp}
 c) Ionic product > K_{sp} d) Ionic product $\geq K_{sp}$

79. In $\text{H}_2 - \text{O}_2$ fuel cell the reaction occurs at cathode is

- a) $2\text{H}_2(\text{g}) + \text{O}_2(\text{g}) \longrightarrow 2\text{H}_2\text{O}(\text{g})$ b) $\text{H}^+(\text{aq}) + \text{OH}^-(\text{aq}) \longrightarrow \text{H}_2\text{O}(\text{l})$
 c) $\text{O}_2(\text{g}) + 2\text{H}_2\text{O}(\text{l}) + 4\text{e}^- \longrightarrow 4\text{OH}^-(\text{aq})$ d) $\text{H}^+ + \text{e}^- \longrightarrow \frac{1}{2}\text{H}_2$

80. easily liquefiable gas is

- a) Ar b) Ne c) Kr d) He

81. Which of the following pair is correct for square planer complex (coordination number and hybridization)

- a) 4 & dsp^2 b) 3 & sp^2 c) 4 & sp^3 d) 2 & sp

82. Collodion is a 4% solution of which one of the following compounds in alcohol – ether mixture?

- a) Nitroglycerine b) Cellulose acetate c) Nitrocellulose d) Glycol dinitrate

83. If the solubility product of lead iodide is 3.2×10^{-8} , its solubility will be

- a) $4 \times 10^{-4}\text{M}$ b) $2 \times 10^{-3}\text{M}$ c) $1.6 \times 10^{-5}\text{M}$ d) $1.8 \times 10^{-5}\text{M}$

84. Nylon is an example of

- a) polythene b) polyamide c) polyester d) poly saccharide

85. _____ used as a fuel for cars.

- a) Chloropicrin b) Nitro ethane c) Nitro benzene d) Nitro methane

86. The yellow colour in NaCl crystal is due to

- a) refraction of light from Na^+ ion b) reflection of light from Cl^- ion on the surface
 c) excitation of electrons in F centers d) all of the above

87. Which one of the following reaction represents calcinations?

- a) $2\text{Zn} + \text{O}_2 \rightarrow 2\text{ZnO}$ b) $\text{MgCO}_3 \rightarrow \text{MgO} + \text{CO}_2$
 c) $2\text{ZnS} + 3\text{O}_2 \rightarrow 2\text{ZnO} + 2\text{SO}_2$ d) Both (a) and (c)

88. Colour of U^{3+} ion is :

- a) Yellow b) Green c) Blue d) Red

89. The most effective electrolyte for the coagulation of As_2S_3 is

- a) NaCl b) $\text{Ba}(\text{NO}_3)_2$ c) $\text{K}_3[\text{Fe}(\text{CN})_6]$ d) $\text{Al}_2(\text{SO}_4)_3$

90. $\text{HO}-\text{CH}_2-\text{CH}_2-\text{OH}$ on heating with periodic acid gives

- a) methanal b) Glyoxal c) methanoic acid d) CO_2

91. Which of the following reagent can be used to convert nitrobenzene to aniline

- a) $\text{Zn/Hg} / \text{NaOH}$ b) Sn / HCl c) LiAlH_4 d) All of these

92. Potassium has a bcc structure with nearest neighbor distance 4.52 Å. its atomic weight is 39 g mol^{-1} . its density will be

- a) 390 kg m^{-3} b) 2142 kg m^{-3} c) 452 kg m^{-3} d) 915 kg m^{-3}

93. In a protein, various amino acids linked together by

- a) Peptide bond b) Dative bond c) α - Glycosidic bond d) β - Glycosidic bond

94. Formula of tris(ethane-1,2-diamine)iron(II)phosphate

- a) $[\text{Fe}(\text{H}_2\text{N}-\text{CH}_2-\text{CH}_2-\text{NH}_2)_3](\text{PO}_4)_2$ b) $[\text{Fe}(\text{H}_2\text{N}-\text{CH}_2-\text{CH}_2-\text{NH}_2)_3]\text{PO}_4$
 c) $[\text{Fe}(\text{H}_2\text{N}-\text{CH}_2-\text{CH}_2-\text{NH}_2)_3](\text{PO}_4)_2$ d) $[\text{Fe}(\text{CH}_3-\text{CH}(\text{NH}_2)_2)_3](\text{PO}_4)_3$

95. Vitamin C is known as

- a) Riboflavin b) Thiamine c) Ascorbic acid d) Pyridoxine

96. The vacant space in bcc lattice unit cell is

- a) 48% b) 23% c) 26% d) 32%

97. Isopropylbenzene on air oxidation in the presence of dilute acid gives

- a) C_6H_5-OH b) $C_6H_5-CO-CH_3$ c) $C_6H_5-CO-C_6H_5$ d) C_6H_5-COOH

98. Which of the following metal does not acts as Sacrificial anode for Iron (Fe) :

- a) Li b) Mg c) Pb d) Zn

99. Assertion: rate of reaction doubles when the concentration of the reactant is doubles if it is a first order reaction.

Reason: rate constant also doubles

- a) Both assertion and reason are true and reason is the correct explanation of assertion.
b) Both assertion and reason are true but reason is not the correct explanation of assertion.
c) Assertion is true but reason is false. d) Both assertion and reason are false

100. How many moles of I_2 are liberated when 1 mole of potassium dichromate react with potassium iodide?

- a) 1 b) 3 c) 2 d) 4