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Question Bank

Subject: Chemistry, **Course:** B.Sc.(H), **Year:** Part 1
Paper: I

Group-A

Unit-1 (Gaseous state)

Q.1. Kinetic energy per mole of an ideal gas

(a) is proportional to temperature (b) inversely proportional to temperature

(c) is independent of temperature (d) is zero at 0^oC

Q.2.The temperature of a sample of a gas is raised from 127^oC to 527^oC. The average kinetic energy of the gas

(a) does not change (b) is doubled (c) is halved (d) cannot be calculated

Q.3. The compressibility factor for an ideal gas is

(a) 1.5 (b) 1.0 (c) 2.0 (d) 0

Q.4. The compressibility factor Z is given by

(a) $Z= PV/RT^2$ (b) $Z= PV/2RT$ (c) $Z=PV/RT$ (d) $Z=2PV/RT$

Q.5. The temperature above which a gas cannot be liquefied is known as

(a) inversion temperature (b) critical temperature (c) neutral temperature (d) Curie temperature

Q.6. Vander Waals gas equation is used for

(a) real gas (b) ideal gas (c) both (d) vapour

Q.7. In Vander Waals equation ‘a’ signifies

(a) Intermolecular attraction (b) Intramolecular attraction (c) attraction between molecules and wall of container (d) volume of molecule

Q.8. A helium atom is two times heavier than a hydrogen molecule at 298 K, the averagekinetic energy of helium is

(a) two times that of hydrogen molecules (b) same as that of hydrogen molecules

(c) four times that of hydrogen molecules (d) half that of hydrogen molecules

Q.9. Vander Waals real gas act as an ideal gas

(a) high temperature and low pressure (b) low temperature and high pressure

(c) high temperature and high pressure (d) low temperature and low pressure

Q.10. The unit of Vander Walls constant ‘a’ is

(a) L^2atm mol^{-1} (b) L^3atm mol^{-1} (c) L atm mol^{-1} (d) atm mol^{-1}

Q.11. A gas deviates from ideal behaviour at a high pressure because its molecules

(a) have kinetic energy (b) are bounded by covalent bond (c) attract one another (d) show Tyndall effect

Q.12. At N.T.P. 1 mole of gas occupied a volume equal to

(a) 11.2 L (b) 22.4 L (c) 1.12 L (d) 2.24 L

Q.13. The unit of Vander Waals constant ‘b’ is

(a) L mol^{-1} (b) L^2 mol^{-1} (c) L mol (d) L mol^{-2}

Q.14. The correct relation between Boyle’s temperature (T_B) and Vander Waals constants are

(a) $T_B = a/Rb$ (b) $T_B = a/2Rb$ (c) $T_B = b/Ra$ (d) $T_B = 2a/Rb$

Q.15. The correct relation between critical volume (V_C) and Vander Waals constants are

(a) $V_C = 3b$ (b) $V_C = 2b$ (c) $V_C = b$ (d) $V_C = 4b$

Q.16. At critical constant, the value of compressibility factor of 1 mole of real gas is equal to

(a) 0.235 (b) 0.375 (c) 0.567 (d) 0.425

Q.17. The correct statement about critical temperature is

(a) It is different for different gases (b) same for all gases (c) it is greater than room temperature (d) all

Q.18. Which of following is not the value of R

(a) 1.99 cal K^{-1} mol^{-1} (b) 0.0821 L atm K^{-1} mol^{-1} (c) 9.8 kcal K^{-1} mol^{-1} (d) 8.3 J K^{-1} mol^{-1}

Q.19. The correct relation between critical temperature (T_C) and Vander Waals constants are

(a) $T_C = 8a/27Rb$ (b) $T_C = a/27Rb$ (c) $T_C = 8b/27Ra$ (d) $T_C = 8a/Rb$

Q.20. The critical temperature of a gas is that temperature

(a) above which it cannot remain as a gas (b) above which it cannot be liquefied by pressure

(c) at which it solidifies (d) at which volume of gas becomes zero

Q.21. The correct relation between critical pressure (P_C) and Vander Waals constants are

(a) $P_C = 8a/27b^2$ (b) $P_C = a/b^2$ (c) $P_C = a/27b^2$ (d) $P_C = a/27Rb^2$

Q.22. The correct form of Vander Waals equation of one mole of real gas is

(a) $(P + a/V^2)(V-b) = RT$ (b) $(P + a/V^2)(V-b) = RT^2$

(c) $(P + a/V)(V-b) = RT$ (d) $(P + a/V^2)(V^2-b) = RT$

Q.23. The Vander Waals constant of a gas are, a = 0.751 L^2atm mol^{-1} and b = 0.0226 L mol^{-1}. What is value of critical volume of gas?

(a) 0.0678 L mol^{-1} (b) 0.0339 L mol^{-1} (c) 0.0456 L mol^{-1} (d) 0.234 L mol^{-1}

Q.24. Which is not true in case of ideal gas?

(a) It cannot be converted into liquid (b) There is no interaction between its molecules

(c) All the molecules of gas move with the same speed (d) At a given temperature PV is proportional to the amount of the gas.

Q.25. The values of van der Waals constant 'a' for the gases O_2, N_2, NH_3 and $CH_4$are 1.36, 1.39, 4.17 and 2.253 L^2atm $mole^{-2}$ respectively. The gas which can most easily be liquefied is

(a) O_2 (b) N_2 (c) NH_3 (d) CH_4

Unit-2 (Liquid state)

Q.26. On increasing temperature of liquid, its surface tension

(a) increases (b) decreases (c) do not change (d) none of these

Q.27. With increase in temperature the fluidity of liquids

(a) increases (b) decreases (c) do not change (d) none of these

Q.28. The rise of liquid in a capillary tube is due to

(a) viscosity (b) osmosis (c) diffusion (d) surface tension

Q.29. The viscosity of which liquid is maximum?

(a) water (b) glycol (c) acetone (d) ethanol

Q.30. Unit of surface tension is

(a) dyne cm (b) dyne cm^{-1} (c) dyne cm^{-2} (d) unitless

Q.31. Parachors of two liquids can be compared by

(a) their molar volumes (b) their molecular weights (c) their atomic number (d) none of these

Q.32. Parachor is a property which is

(a) Additive cum constitutive (b) colligative (c) Additive (d) none of these

Q.33. For any liquid the number of drops formed per unit volume depend on

(a) viscosity (b) surface tension (c) upon pressure (d) more

Q.34. The experimental value of parachor of benzene is

(a) 107 (b) 206.2 (c) 236 (d) 307

Q.35. The boiling point of water, ethanol and diethylether are 100°C, 78.5°C and 34.6°C respectively. The intermolecular forces will be in order of

(a) water> ethanol > diethyl ether (b) ethanol >water >diethyl ether

(c) diethyl ether >water >ethanol (d) diethyl ether >ethanol >water

Q.36. The unit of coefficient of viscosity is

(a) dyne cm^{-1} sec (b) dyne cm^{-2} sec (c) dyne cm^{-2} sec^{-1} (d) $dyne^2$ cm^{-2} sec

Q.37. The unit of coefficient of viscosity is also express in poise. 1 poise is equal to

(a) 10^{-1} kg m^{-1} sec^{-1} (b) 10^{-2} kg m^{-2} sec^{-1} (c) kg m^{-1} sec^{-1} (d) 10^{-2} kg m^{-1} sec^{-1}

Q.38. The effect of temperature on viscosity of liquid is

(a) increases (b) decreases (c) do not change (d) none of these

Q.39. The effect of pressure on viscosity of liquid is

(a) increases (b) decreases (c) do not change (d) none of these

Q.40. Water boils at lower temperature on high altitudes because

(a) atmospheric pressure is low there (b) atmospheric pressure is high there

(c) water is weakly hydrogen bonded there (d) water is pure form is found there

Q.41. Normal boiling point of a liquid is that temperature at which vapour pressure of the liquid is equal to

(a) 0 (b) 380 mm Hg (c) 760 mm Hg (d) 100 mm Hg

Q.42. Mark the statement which is correct?

(a) Surface tension of liquid increases with temperature

(b) Addition of chemicals reduces the surface tension of a liquid

(c) Stalagmometer is used for measuring viscosity of the liquid

(d) Viscosity of a liquid does not depend on the intermolecular forces

Q.43. Liquid in which Trouton's rule is not obey

(a) Water (b) Benzene (c) Carbon tetrachloride (d) Cyclohexane

Q.44. The ratio of molar heat of vaporisation and boiling point of a liquid is constant (nearly 85–88 J K^{-1} mol^{-1}). This is known as

(a)Ostwald's rule (b) Trouton's rule (c) Phase rule (d) Vont Hoff rule

Q.45. Which of the following does not decrease with rise in temperature?

(a) Density (b) Surface tension (c) Vapour pressure (d) Viscosity

Q.46. Liquids are similar to gases because

(a) bothpossess the property of flowing and take the volume of their containers

(b) both diffuse and take the shape of their containers

(c) both are readily compressible and diffuse

(d) both are capable of infinite expansion

Q.47. Which statement is not correct?

(a) Liquids diffuse slowly than the gases.

(b) During evaporation of liquids heating is always caused.

(c) Vapour pressure of a liquid rises with rise in temperature.

(d) Viscosity of liquid decreases with rise in temperature.

Q.48. The reciprocal of viscosity is known as

(a) Anti viscosity (b) intrinsic viscosity (c) Reduced viscosity (d) Fluidity

Q.49. The following is a method to determine the surface tension of liquids

(a) Single capillary method (b) refractometric method

(c) polarimetric method (d) boiling point method

Q.50. Which of following statement regarding liquid is not correct?

(a) The vapour pressure of a liquid increases in the presence of a non-volatile impurity.

(b) At the normal boiling point, the vapour pressure of a liquid is 1 atm.

(c) The vapour pressure of liquid increases with increase in temperature.

(d) Relative lowering of vapour pressure is a colligative property.

Unit-3 (Phase equilibrium)

Q.51. The phase rule was given by

(a) Freundich (b) Willard Gibbs (c) Langmuir (d) Helmholtz

Q.52. Phase rule states

(a) F = C- P + 2 (b) F = C + P - 2 (c) F = P + C + 2 (d) F + C + P = 2

Q.53. The triple point is the temperature where

(a) three phases are in equilibrium (b) the number of degree of freedom is three

(c) three component are in equilibrium (d) none of these

Q.54. A triple point is

(a) trivariant (b) bivariant (c) invariant (d) tetravariant

Q.55. In a one component system the number of phases at triple point are

(a) 3 (b) 2 (c) 1 (d) 0

Q.56. The maximum number of phases in a one component system is

(a) 0 (b) 1 (c) 2 (d) 3

Q.57. The phase rule is applicable to

(a) homogeneous system (b) heterogeneous system (c) both (d) none of these

Q.58. How many solid phases are present in sulphur system?

(a) 1 (b) 2 (c) 3 (d) zero

Q.59. How many degree of freedom are there at a point where three phases meet?

(a) 1 (b) 0 (c) 3 (d) 2

Q.60. There cannot be a quadrupole point one phase digram for one component system because the number of degree of freedom cannot be

(a) 3 (b) -1 (c) 0 (d) 2

Q.61. $CaCO_3 \rightleftharpoons CaO + CO_2$ system contains the components

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

Q.62. Number of phases in $CaCO_3 \rightleftharpoons CaO + CO_2$ system is

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

Q.63. The degree of freedom in ice $\rightleftharpoons$ water $\rightleftharpoons$ vapour system is

(a) 1 (b) 2 (c) 3 (d) 0

Q.64. Number of component in ice $\rightleftharpoons$ water $\rightleftharpoons$ vapour system is

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

Q.65. The temperature at which the relative stability of two phases of an element changes is called

(a) triple point (b) transition point (c) melting point (d) eutectic point

Q.66. How many components and maximum phases are present in KI-H_2O system?

(a) 2, 4 (b) 3, 4 (c) 1, 2 (d) 2, 2

Q.67. Solid KI, ice and solution are present at a point, the degree of freedom at this point is

(a) 1 (b) 2 (c) 0 (d) 4

Q.68. Zn-Mg system is

(a) congruent melting point (b) incongruent melting point (c) simple eutectic (d) none of these

Q.69. Number of phases in ice $\rightleftharpoons$ water $\rightleftharpoons$ vapour system is

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

Q.70. At eutectic point, number of degree of freedom is

(a) 1 (b) 2 (c) 0 (d) 4

Q.71. What is number of phase in mixture of nitrogen and hydrogen gases

(a) 1 (b) 2 (c) 0 (d) 4

Q.72. Congruent melting point is

(a) temperature at which solid and liquid phase of compound has same composition

(b) temperature at which solid starts to melt

(c) temperature at which one solid phase transform into another solid phase

(d) none of above

Q.73.Which of following do not come in congruent melting point system?

(a) Zn-Mg (b) $FeCl_3$-H_2O (c) Al-Mg (d) Na-K

Q.74.Which of following do not come in incongruent melting point system?

(a) picric acid-benzene (b) gold-antimony (c) KI-water (d) Na-K

Q.75. The reason of efflorescence is

(a) Dissociation pressure of hydrated crystal is higher than the partial pressure of water vapour in the atmosphere at the room temperature.

(b) Substance is more soluble in water, and vapour pressure of this solution is less than the partial pressure of water vapour in the atmosphere at the room temperature.

(c) both (d) none of above

Unit-4 (Electrical transport)

Q.76.Electrolytic conduction is due to the movement of which of following?

(a) Molecules (b) Atoms (c) Ions (d) Electrons

Q.77. Which of the following is the unit of molar conductance?

(a) mho mol^{-1} (b) mho cm^2mol^{-1} (c) mho $cm^{-1}mol^{-1}$ (d) mho $cm^{-2}mol^{-1}$

Q.78. The units of specific conductance are

(a) ohm cm (b) ohm cm^{-1} (c) ohm^{-1} (d) ohm^{-1} cm^{-1}

Q.79. Which of the following equations is correct?

(a) Cond. = sp. cond. x cell constant

(b) Eq. cond. = sp. cond. x cell constant

(c) Cond. = molar cond. x cell constant

(d) Cell constant = sp. cond./cond.

Q 80. The sum of the transport number of anion and cation is equal to

(a) 1 (b) 0 (c) 0.5 (d) 0.25

Q.81. The distance between two electrodes of a cell is 3.0 cm and area of each electrode is 6.0

cm^2, the cell constant is

(a) 2.0 (b) 1.0 (c) 0.5 (d) 18

Q.82. The fraction of total current carried by the cation or anion is termed as

(a) Fractional number (b) transport number (c) Speed number (d) carrier number

Q.83. Effect of dilution on molar conductance is

(a) Increases (b) decreases (c) Do not change (d) none of given

Q.84. When a strong acid is titrated against a strong base the end point is the point of

(a) Zero conductance (b) maximum conductance (c) Minimum conductance (d) none of these

Q.85. Effect of dilution on specific conductance is

(a) Increases (b) decreases (c) Do not change (d) none of given

Q.86. Kohlraush's law is used in calculation of molar conductance at infinite dilution of

(a) Strong electrolyte (b) Weak electrolyte (c) both (d) none of given

Q.87. At infinite dilution, the molar conductance of CH_3COONa, HCl and CH_3COOH are91, 426 and 391 mho cm^2 mol^{-1} respectively at 25°C. The molar conductance of NaCl at infinite dilution will be

(a) 126 (b) 209 (c) 391 (d) 908

Q.88. Which of the following solutions of KCl has the lowest value of specific conductance?

(a) 1 M (b) 0.1 M (c) 0.01 M (d) 0.001 M

Q.89. Which of the following solutions of KCl has the lowest value of molar conductance?

(a) 1 M (b) 0.1 M (c) 0.01 M (d) 0.001 M

Q.90. Specific conductance of decimolar solution of KCl at 18°C is 1.12 S m^{-1}. The resistance of a conductivity cell containing the solution at 18°C was found to be 55 ohm. The cell constant is

(a) 30.3 m^{-1} (b) 61.6 m^{-1} (c) 16.6 m^{-1} (d) 81.5 m^{-1}

Q.91. The specific conductance of 0.2 M KCl is 2.48 x 10^{-2} S cm^{-1}. The molar conductance will be

(a) 124 S-cm^2-mol^{-1} (b) 62 S-cm^2-mol^{-1} (c) 12.4 S-cm^2-mol^{-1} (d)0.124 S-cm^2-mol^{-1}

Q.92. If the specific conductance and conductance of a solution is same, then its cell constant is

(a) 0 (b) 10 (c) 100 (d) 1

Q.93. At infinite dilution when dissociation of an electrolyte is complete each ion makes a definite contribution towards the molar conductance. This is statement of

(a) Debye-Huckel law (b) Voltaic law (c) Kohlrausch's law (d) Faraday's law

Q.94. Electric conductance is direct measure of

(a) concentration (b) resistance (c) current (d) none of these

Q.95. An increase in molar conductance of a strong electrolyte with dilution is mainly due to

(a) increase in ionic mobility of ions (b) 100% ionisation of electrolyte at normal dilution

(c) increase in both (d) increase in number of ions.

Q.96. The cell constant of a given cell is 0.367 cm^{-1}. The resistance of a solution placed in this cell is measured to be 31.6 ohm. The conductivity of the solution (in S cm^{-1}) is

(a) 11.6 (b) 0.031 (c) 86.15 (d) 0.0116

Q.97. Unit of ionic mobility is

(a) m^2 sec^{-1} $volt^{-1}$ (b) m sec^{-1} (c) m sec^{-1} volt (d) m sec^{-1} $volt^{-1}$

Q.98. Ionic conductivity of Na+ is 50 and that of OH^- is 198. Molar conductance of NaOH is

(a) 148 (b) 248 (c) -148 (d) -248

Q.99. The unit ohm^{-1} is used for

(a) molar conductance (b) specific conductance (c) conductance (d) none of these

Q.100. Which one of the following has the highest molar conductance?

(a) Diamminedichloroplatinum (II) (b) Tetraamminedichlorocobalt (III) chloride

(c) potassiumhexacyanoferrate (II) (d) potassium hexacyanoferrate (III)

Group B

(Periodic Table)

Q1. Which of the following elements is most electronegative?

(a) N (b) O

(c) Cl (d) F

Q2. Which of the following ion is largest?

(a) Al^{+3} (b) Mg^{+2}

(c) N^{-3} (d) O^{-2}

Q3. Which of the following element has maximum electron affinity ?

(a)Se (b) O

(c) Te (d) S

Q.4 Which of the following statement is not correct?:

(a) Ionic mobility of $Na^{+}(aq)$ is greater than $Mg^{2+}(aq)$

(b) The E.A. of 'F' atom is more than 'Cl' atom

(c) Second I.P. of 'B' atom is greater than that of 'C' atom

(d) I.E. of O^{-} is less than that of 'O' atom.

Q.5 Which of the following species of Mn has lowest electronegativity?

(a) Mn(II) (b) Mn(IV)

(c) Mn(VI) (d) Mn(VII)

Q.6 The E.N. of H, X, O are 2.1, 0.8 and 3.5 respectively comment on the nature of the compound H–O–X, that is :

(a) Basic (b) Acidic

(c) Amphoteric (d) Can't be predicted

Q.7 Choose the **correct** order of the following according to property:

(a) N–H > Sb–H > As–H > P–H :Polarity order

(b) $Mg^{2+}(aq) > Sr^{2+}(aq) > Ba^{2+}(aq)$:Hydrated radius order

(c) $Mg^{2+}(aq) > Sr^{2+}(aq) > Ba^{2+}(aq)$:Ionic mobility order

(d) NaF > MgO > SrO :Lattice energy order

Q.8 Which of the following process is associated with best possibility of the energy release.

(a) $Li \rightarrow Li^{+} + e^{-}$ (b) $O^{-} + e^{-} \rightarrow O^{2-}$

(c) $Cl^{+} + e^{-} \rightarrow Cl$ (d) $Be + e^{-} \rightarrow Be^{-}$

Q.9 Choose the **incorrect** order of the following

(a) F> Cl > Br :electronegativity

(b) F> Cl > Br :electron affinity

(c) $F_2 > Cl_2 > Br_2$:oxidising power

(d) $Cl_2 > Br_2 > F_2$:Bond stability

Q10. The correct order of first ionization energy is

(a) Be (b) B (c) N (d) O

(a) a>b>c>d (b) d>c>a>b

(c) b>a>c>d (d)c>d>a>b

Q11. The correct set of isoelectronic species is

(a) CO &CO_2 (b) H_2O & H_2O_2

(c) CO & N_2 (d)CN- & NO

Q12. The atomic radii of Fluorine and Neon (in Angstrom) respectively will be

(a) 0.72 &0.72 (b) 0.72 & 1.60

(c) 1.60 & 1.60 (d)0.82 & 0.82

Q13 Which one of the following is correct order of the size of iodine species?

(a) $I > I^{-} > I^{+}$ (b) $I > I^{+} > I^{-}$

(c) $I^{+} > I^{-} > I$ (d) $I^{-} > I > I^{+}$

Q14 What should be the order of size of H^{-1}, H^{+1} and H ?

(a) $H^{+1} < H < H^{-1}$ (b)$H^{+1} < H^{-1} < H$

(c) $H < H^{+1} < H^{-1}$ (b) $H < H^{-1} < H^{+1}$

Q15 The van der Waal's radii of O, N, Cl, F and Ne increase in the order

(a) F, O, N, Ne, Cl (b) N, O, F, Ne, Cl

(c) Ne, F, O, N, Cl (d) F, Cl, O, N, Ne

Q16 Calculate the bond length of C–X bond, if C–C bond length is 1.54 Å, X–X bond length is 1.00 Å and electronegativity values of C and X are 2.0 and 3.0 respectively

(a) 1.00 Å (b) 0.77 Å (c) 0.54 Å (d) 1.18 Å

Q17 Which of the following should be the longest bond ?

(a) S–H (b) O–H (c) N–H (d) P–H

Q18 An element with least atomic size amongst carbon, nitrogen, boron and beryllium .

(a) carbon, (b) beryllium .

(c) nitrogen (d) boron

Q19. The correct ionization energy of third period element?

(a) Na > Mg > Al > Si (b) S i> Mg > A l> Na

(c) Si > Mg > Na > Al (d) Si > Al > Mg > Na

Q20. The correct ionic size of given species is ?

(a) $F^- > Br^- > Cl^- > S^{-2}$ (b) $F^- > Br^- > S^{-2} > Cl^-$

(c) $S^{-2} > Cl^- > Br^- > F^-$ (d) $Br^- > S^{-2} > Cl^- > F^-$

Q21. Which one is correct ionization enegy?

(a) S > P > As (b) As > P > S

(c) P > S > As (d) As > P > S

Q22. Which one is amphoteric oxide?

(a) Cl_2O_7 (b) Al_2O_3

(c) SO_3 (d) SiO_2

Q.23 The correct order of covalent nature of following halide is

(a) $CaCl_2 > BeBr_2 > BaCl_2 > SrCl_2$ (b)$CaCl_2 > SrCl_2 > BaCl_2 > BeCl_2$

(c) $BeBr_2 > CaCl_2 > SrCl_2 > BaCl_2$ (d) $BeCl_2 > CaCl_2 > SrCl_2 > BaCl_2$

Q.24 IIA group metals form carbonate. The correct decreasing order of thermal stability is

(a) $CaCO_3 > BeCO_3 > BaCO_3 > SrCO_3$ (b)$CaCO_3 > SrCO_3 > BaCO_3 > BeCO_3$

(c) $BeCO_3 > CaCO_3 > SrCO_3 > BaCO_3$ (d) $BaCO_3 > SrCO_3 > CaCO_3 > BeCO_3$

Q.25 Boron forms BX_3 type of halides. The correct increasing order of Lewis-acid strength of these halides is

(a) $BF_3 > BCl_3 > BBr_3 > BI_3$ (b) $BI_3 > BBr_3 > BCl_3 > BF_3$

(c) $BF_3 > BI_3 > BCl_3 > BBr_3$ (d) $BF_3 > BCl_3 > BI_3 > BBr_3$

Q26 The increasing order of electron gain enthalpy with negative sign

(a) O < Te < Se < S (b) Te < Se < S<O

(c) S < O < Te < Se (d)O < Te < S< Se

Q27 The Incorrect statement among the following is

(a) H_2S is more acidic than H_2O. (b) H_2S is more acidic than H_2Se.

(c) NH_3 is more basic than PH_3. (d) PH_3 is more basic than SbH_3.

Q28 Which one is incorrect about PCl_5

(a) gaseous PCl_5has sp^3d hybridization state

(b)Solid PCl_5 exist as a free covalent molecule

(c) Solid PCl_5 exists as ionic pair $[PCl_4]^+ [PCl_6]^-$

(d) In Solid PCl_5 , P is in sp^3 and sp^3d^2 hybridization state

Q.29 Which one of the following compounds has nonzero dipole moment ?

(a) BrF_5 (b) ClF_3 (c) SF_4 (d) XeF_2

Q.30 Which one of the following has most acidic nature ?

(a) SO_2 (b) SO_3 (c) MnO_2 (d) SiO_2

Q31 Mercury is a liquid at 0°C because of

(a) Low high ionisation energy (b) weak metallic bonds

(c) high heat of hydration (d) high heat of sublimation

Q32 The ionisation energies of transition elements are

(a) more than p-block elements (b) more than s-block elements

(c) less than s-block elements (d) more than p-block elements

Q.33 Which is not Amphoteric oxide?

(a) Al_2O_3 (b) SnO (c) ZnO (d) Fe_2O_3

Q34. The internuclear distance between two H atoms in H_2 molecule is 74 pm. Its covalent radius is

(a)37 pm (b) 148 pm (c) 18.5 pm (d) 25 pm

Q35. Which is correct about size?

(a) $Na^+ > Na$ (b) $Ca > Ca^{++}$ (c) $Cl^- < Cl$ (d) C < N

Q36. Al^{+++} is isolectronic with

(a) Al (b) S^{4+} (c) Na^+ (d) N^{2-}

Q37. First ionisation enthalpy of B as compared to Be is

(a) Low (b) High (c) Same (d) times

Q38. Highest third ionisation enthalpy is possesed by

(a)$1s^2, 2s^2$ (b) $1s^2, 2s^2, 2p^1$ (c) $1s^2, 2s^2, 2p^4$ (d)$1s^2, 2s^2, 2p^3$

Q39. The correct order for atomic radius is

(a) O < F < Ne (b) O > Ne > F

(c) O > F > Ne (d) F < O < Ne

Q40. Isoelectronic species are

(a) Neutral or charged species differing in effective nuclear charge

(b) Charged or neutral species differing in nuclear charge

(c) Neutral or charged species having same number of neutrons

(d) Those which have same mass number

Q41. Among N^{-2}, O^{-2}, S^{-2} and F^{-} the ion with smallest radii is

(a) O^{-2} (b) S^{-2} (c) N^{-3} (d) F^{-}

Q42. Which set is correct for second ionisation enthalpy of N and O respectively?

(a) 1600 kJ/mol, 1700 kJ/mol (b) 1700 kJ/mol, 1600 kJ/mol

(c)1800 kJ/mol, 1600 kJ/mol (d) 1700 kj/mol, 1400 kJ/mol

Q43. The first, second and third ionisation enthalpies of an element are 2370, 6000, 6050 kJ/mole respectively. The element is likely to be

(a) A reactive non-metal (b) A reactive metal

(c) A noble gas (d) A metalloid

Q44. Most negative electron gain enthalpy is possesed by

(a) F (b) Cl (c)Br (d)O

Q45. The correct non-metallic character order is

(a) Si < C < B (b) Si < B < C (c) B < Si < C (d) B < C < Si

Q46. The most acidic oxide is

(a) SO_3 (b) SiO_2 (c) Al_2O_3 (d) Cl_2O_7

Q47. Highest ionisation enthalpy is possessed by

(a) Alkali metals (b) Noble gases (c)Halogens (d)f block elements

Q48. Covalent radius is half of the internuclear distance between two carbon atoms bonded as

(A) C – C (b)C = C (c) C ≡ C (d) C
C

Q49. Atomic and ionic radii are determined from

(a) Enthalpy datas (c) X-ray studies

(c) Electronegativity values (d) Screw guaze

Q50. Lanthanum belongs to

(a) s-block (b) d block (c) f-block (d) p-block

Group B Unit 2: Chemical bonding

51. IF_7 has bond pair/s and lone pair/s, respectively-

a) 7, 0

b) 2, 3

c) 5, 2

d) 4, 3

52. Which of the following is not an exception of octet rule?

a) BF_3

b) PF_5

c) CO_2

d) IF_7

53. Which of the following molecules has net dipole moment?

a) CCl_4

b) C_2H_2

c) BF_3

d) NH_3

54. PCl_5 molecule has the following geometry-

a) Trigonal bipyramidal

b) Octahedral

c) Square planar

d) Planar triangular

55. Which of the following molecules does not contain lone pair of electrons on the central atom

a) NH_3

b) PF_5

c) H_2O

d) SF_4

56. Hydrogen bond is strongest in-

a) S-H••••••O

b) O-H••••••S

c) F-H••••••F

d) F-H••••••O

57. What type of hybridization is possible in square planar molecule?

a) sp^3d

b) dsp^2

c) sp^3d^2

d) sp^3d^2

58. Which of the following molecules will form a linear polymer structure due to hydrogen bonding?

a) HCl

b) HF

c) H_2O

d) NH_3

59. Which of the following is not a correct statement?

a) The canonical structures have no real existence.

b) Every AB_5 molecule does in fact have a square pyramid structure.

c) Multiple bonds are always shorter than the corresponding single bond.

d) The electron deficient molecule can act as Lewis acid.

60. In which of the following molecule the central atom has two lone pair of electrons?

a) SF_4

b) BrF_5

c) XeF_4

d) SO_2

61. Which of the following have maximum covalent character?

a) LiI

b) LiF

c) LiCl

d) LiBr

62. Which of the following has co-ordinate bonds?

a) N_2

b) $CaCl_2$

c) O_3

d) H_2O

63. Lattice energy of an ionic compound depends on-

a) Charge of the ion only

b) Size of the ion only

c) Packing of the ion only

d) Charge on the ion and size of the ion

64. Which of the following is electron deficient molecule?

a) C_2H_6

b) SiH_4

c) B_2H_6

d) PH_3

65. How many Hydrogen bonded water molecule are associated with $CuSO_4.5H_2O$?
    a) 1
    b) 2
    c) 3
    d) 4
66. Which of the following contains ionic covalent and co-ordinate bonds?
    a) NaOH
    b) NaCl
    c) NaCN
    d) NaNC
67. Which of the following compound is expected to have highest lattice energy?
    a) NaCl
    b) NaBr
    c) MgF_2
    d) MgO
68. Dissociation energy is-
    a) Energy required to change solid state into a gas
    b) Energy required to change solid state to a liquid
    c) The energy required to break a compound
    d) Change in energy when an element forms a compound
69. A theory which describes chemical bonding is-
    a) Dalton's theory
    b) Valence bond theory
    c) Atomic theory
    d) Raoult's law
70. The head- to- head overlapping of atomic orbitals forms-
    a) Sigma bond
    b) Pi bond
    c) Covalent bond
    d) Co-ordinate bond
71. The weak intermolecular forces that is dependent on the distance between atoms and molecules are-
    a) Frictional forces

b) Cohesive forces
c) Van der Waals forces
d) Gravitational forces

72. Van der Waals forces are-
a) Short range forces
b) Long range forces
c) Null forces
d) Depend on the atoms and molecules

73. The types of hybridization on the five carbon atoms from left to right in the molecule CH_3-CH=CH-CH_3 are-
a) sp^3,sp^2,sp^2,sp^2,sp^3
b) sp^3,sp,sp^2,sp^2,sp^3
c) sp^3,sp^2,sp,sp^2,sp^3
d) sp^3,sp^2,sp^2,sp,sp^3

74. The force that arise due to the interaction between an instantaneous dipole and an atom or molecule is called-
a) Van der Waal forces
b) Gravitational forces
c) London dispersion forces
d) Frictional forces

75. Bond angle of SF_4 molecule are likely-
a) 89°, 117°
b) 120°, 180°
c) 45°, 118°
d) 117°, 92°

76. The molecule having smallest bond angle is-
a) $AsCl_3$
b) $SbCl_3$
c) PCl_3
d) NCl_3

77. In which of the following, the bond angle between two covalent bonds, is maximum?
(a) H_2O (b) NH_3 (c) CO_2 (d) CH_4

78. What type of bonding exists in IF_7?

(a) Coordinate bond (b) Covalent bond (c) Both (d) Ionic bond

79. The hybridization of carbon involved in acetyline is-

(a) sp^2 (b) sp^3 (c) sp (d) dsp^2

80. Which of the following has maximum covalent character?

(a) LiF (b) LiI (c) LiBr (c) LiCl

81. For which of following hybridization, the bond angle is maximum?

(a) sp^2 (b) sp (c) sp^3 (d) dsp^2

82. The shape of ClO_4^- is-

(a) Square planar (b) Square pyramidal (c) Tetrahedral (d) Trigonal bipyramidal

83. Hydrogen bond is presented with -

(a) Dotted line (b) Solid line (c) Charge on atoms (d) None of the above

84. What type of hybridization is possible in square planar molecule?

(a) sp^3d (b) dsp^2 (c) dsp^3 (d) sp^3d^2

85. Inter-molecular hydrogen bond exists in-

(a) Salicylic acid (b) Water (c) *ortho*-nitrophenol (d) CO_2

86. Which of the following has coordination bond along with covalent bond?

(a) N_2 (b) $CaCl_2$ (c) O_3 (d) H_2O

87. The correct order of bond angle among H_2O, NH_3, CH_4 and CO_2 molecules is-

(a) $H_2O>NH_3>CH_4>CO_2$ (b) $H_2O<CH_4<CO_2<NH_3$ (c) $H_2O<NH_3<CH_4<CO_2$

(d) $H_2O>NH_3>CO_2>CH_4$

88. Which of the following angle related to sp^2 hybridization?

(a) 90° (b) 120° (c) 180° (d) 109°

89. Which of the following molecule/ion does not contain unpaired electron?

(a) N_2^+ (b) O_2 (c) O_2^{2-} (d) B_2

90. Which species has maximum number of lone pairs of electrons on the central atom?

(a) ClO_3^- (b) XeF_4 (c) SF_4 (d) I_3^-

91. Bond order of Oxygen molecule is-

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

92. Which of the following doesn't exist?

(a) NF_5

(b) PCl_5

(c) SF_6

(d) IF_7

93. The number of lone pairs are identical in the pair of-

(a) Xe_4F_4, ClF_3

(b) XeO_2F_2, ICl_4

(c) XeO_2, ICl_4^-

(d) XeO_4, ClF_3

94. The shape of SF_4 is-

(a) Tetrahedral

(b) Square planar

(c) Trigonal bipyramidal

(d) Octahedral

95. The correct order of the mean bond energies in the binary hybrids is-

(a) $CH_4>NH_3>H_2O>HF$

(b) $NH_3>CH_3>H_2O>HF$

(c) $HF>H_2O>CH_4>NH_3$

(d) $HF>H_2O>NH_3>CH_4$

96. Which molecule has zero bond order?

(a) H_2^+

(b) H_2

(c) HeH

(d) H_2^-

97. According to MO theory, the bond order of diatomic molecules may be **(a),** which is not so according to valence bond theory, Here (a) is-

(a) Integral

(b) Two

(c) Three

(d) Fractional

98. Which of the following has a bond order 2.5?

(a) HCl

(b) CO

(c) NO

(d) N_2

99. Which among the following is a strong oxidizer?

(a) F_2

(b) Cl_2

(c) Br_2

(d) I_2

100. Decreasing order of dipole moment is-

(a) $AsH_3 > BiH_3 < SbH_3 < NH_3 < PH_3$

(b) $BiH_3 > SbH_3 > AsH_3 > NH_3 > PH_3$

(c) $NH_3 > PH_3 > AsH_3 > SbH_3 > BiH_3$

(d) $PH_3 > NH_3 > AsH_3 > SbH_3 > BiH_3$

Group B **Unit 3: s-block elements**

101. Which of the following hydrides is most stable?

(a) LiH

(b) KH

(c) CsH

(d) NaH

102. Which of the following alkali bicarbonate decomposes readily?

(a) $LiHCO_3$

(b) $KHCO_3$

(c) $CsHCO_3$

(d) $NaHCO_3$

103. Which of the metals catches fire in the presence of moisture?

(a) Fe

(b) Na

(c) K

(d) Both (b) & (c)

104. The most electropositive metal among the alkaline earth metals is-

(a) Be

(b) Mg

(c) Ca

(d) Ba

105. In context of beryllium, which one of the following statements is incorrect?

(a) It is rendered passive by nitric acid.

(b) It forms BeC_2.

(c) Its salts rarely hydrolyse.

(d) Its hydride is electron deficient and polymeric.

106. Compared with alkaline earth metals, the alkali metals have

(a) smaller ionic radii.

(b) higher boiling points.

(c) greater hardness.

(d) lower ionization energies.

107. The metallic lustre exhibited by sodium is due to-

(a) diffusion of sodium ion

(b) oscillation of loose electrons

(c) excitation of free protons

(d) none of the above.

108. Lime water is an aqueous solution of-

(a) $CaCO_3$

(b) $Ca(OH)_2$

(c) $MgCl_2$

(d) $CaSO_4$

109. Which of the following among alkaline earth metal does not impart any colour to flame?

(a) Ba

(b) Mg

(c) Ca

(d) Sr

110. Which of the following metal ion play important role in muscles contraction?

(a) K^+

(b) Na^+

(c) Ca^{+2}

(d) Mg^{+2}

111. Which of the following known as the fusion mixture?

(a) mixture of Na_2CO_3 + $NaHCO_3$

(b) Na_2CO_3 .10 H_2O

(c) mixture of K_2CO_3 + Na_2CO_3

(d) $NaHCO_3$

112. Hydration enlthalpy of alkali metals-

(a) increases with increase in ionic radii.

(b) decreases with increase in ionic radii.

(c) no effect of increase in ionic radii.

(d) None of the above.

113. Correct order of hydration enthalpy of alkali metals ion is-

(a) $Li^+ > Na^+ > K^+ > Rb^+ > Cs^+$

(b) $Rb^+ > Cs^+ > Li^+ > Na^+ > K^+$

(c) $Cs^+ > Rb^+ > K^+ > Na^+ > Li^+$

(d) None of the above

114. Among s-block elements, which element/s show anomalous behavior?

(a) Li

(b) Be

(c) Ca

(d) Both (a) & (b)

115. Li shows diagonal relationship with

(a) Ca

(b) Mg

(c) Al

(d) Si

116. Be shows diagonal relationship with

(a) Al

(b) Mg

(c) Ca

(d) Si

117. The reactivity of alkali metals with oxygen-

(a) increases down the group.

(b) decreases down the group.

(c) non-reactive.

(d) none of the above.

118. Which atom/ion of alkaline earth metal is present in Chlorophyll?

(a) Sr

(b) Ba

(c) Ca^{+2}

(d) Mg^{+2}

119. Chemical structure of $BeCl_2$ in solid state is-

(a) polymeric structure with chloro bridges

(b) polymeric structure without chloro bridges

(c) dimeric structure without any bridge

(d) monomer.

120. Correct statement about $BeCl_2$ structure is-

(a) In solid phase, it is a chloro bridged polymeric.

(b) In vapour phase, it is a chloro bridged dimer.

(c) At higher temperature (~1200 K), it is a triatomic monomer.

(d) All the above statements are correct.

121. Which one of the following compounds, belonging to s-block elements, is necessarily added in the cement?

(a) Gypsum

(b) Bleaching powder

(c) Baking soda

(d) None of the above

122. In s- block elements, the outer electronic configuration is-

(a) $ns^{(1-2)}$

(b) $ns^2np^{(1-6)}$

(c) $(n-1)d^{(1-10)}ns^{(0-2)}$

(d) None of these

123. Atomic weight of hydrogen is -

(a) 1.008

(b) 1.06

(c) 1.020

(d) 1.00

124. Electronic configuration of potassium is-

(a) $1s^2$, $2s^2$, $2p^6$, $3s^2$, $3p^6$, $4s^1$

(b) [Ar]$4s^1$

(c)$1s^2$, $2s^2$, $2p^6$, $3s^2$, $3p^6$, $4d^1$

(d) Both (a) & (c)

125. Which column is known as alkali and alkaline earth metals-

(a) Group 3B, 4B

(b) Group 8A, 7A

(c) Group 1A, 2A

(d) Both (a) & (c)

126. S-Block elements, in their outermost orbital/s accommodate only-

(a) 2 electrons

(b) 3 electrons

(c) 4 electrons

(d) 1 electron

127. In periodic table, where s- block elements are present?

(a) In middle

(b) Right side

(c) Left side

(d) At bottom

128. Which one of the alkali metals forms only the normal oxide M_2O on heating in air?

(a) Na

(b) Rb

(c) Li

(d) K

129. Which one of the following elements are in s- block?

(a) Sr

(b) Ar

(c) Kr

(d) Sc

130. Atomic number of Cs is-

(a) 54

(b) 55

(c) 53

(d) 37

131. Among the following oxides, which is most basic ?

(a) MgO

(b)Al_2O_3

(c)ZnO

(d) N_2O_5

132. The tendency to lose their valence electron easily by alkali metals makes them-

(a) strong oxidizing agent

(b) strong reducing agent

(c) weak oxidizing agent

(d) weak reducing agent

133. Which one is the incorrect statement?

(a) Two types of s-block elements are possible.

(b) The s-block elements having only one electron in their s-orbital are called alkaline earth metals.

(c) Size of the alkali metals is larger compound to other element in a particular period.

(d) All the statements are correct.

134. Find incorrect trend for alkaline earth metals-

(a) second ionization energy- Be<Mg<Ca<Sr

(b) hydration enthalpy- Sr<Ca<Mg<Be

(c) density- Ca< Mg<Be<Sr

(d) atomic size- Be<Mg<Ca<Sr

135. Which one of the following is an amphoteric hydroxide?

(a) $Mg(OH)_2$

(b) $Be(OH)_2$

(c) $Ba(OH)_2$

(d) Both (a) & (b)

136. Which one of the following oxides is most acidic in nature-

(a) MgO

(b) BaO

(c) BeO

(d) CsO

137. On heating, which of the following releases CO_2 most easily?

(a) $MgCO_3$

(b) K_2CO_3

(c) $CaCO_3$

(d) Na_2CO_3

138. Property of the alkaline earth metals that increases with their atomic number-

(a) Solubility of their hydroxides in water.

(b) Solubility of their sulphates in water.

(c) Ionization energy.

(d) Electro-negativity.

139. Solubility of the alkaline earth metal sulphates in water decreases in sequence-

(a) Ba>Mg>Sr>Ca

(b) Sr>Ca>Mg>Ba

(c) Ca>Sr>Ba>Mg

(d) Mg>Ca>Sr>Ba

140. Which one of the following has smallest atomic radii?

(a) K

(b) Na

(c) Li

(d) Can’t be predicted

141. The formula of Plaster of Paris is-

(a) $CaSO_4.H_2O$

(b) $CaSO_4 .2H_2O$

(c) $CaSO_4 .1/2H_2O$

(d) $CaSO_4$

142. Which of the following has highest lattice energy?

(a) RbF

(b) NaF

(c) CsF

(d) KF

143. Which one of the following has the strongest bond

(a) CaF

(b) NaCl

(c) Both (a) & (c)

(d) None of these

144. Identify the correct statement-

(a) Plaster of paris can be obtained by hydration of gypsum.

(b)Plaster of paris is obtained by partial oxidation of gypsum.

(c) Gypsum is obtained by heating plaster of Paris.

(d) Gypsum contains a lower percentage of calcium than plaster of Paris.

145. Which of the following products belongs to s-block elements?

(a) Bleaching powder

(b) Washing soda

(c) Baking soda

(d) All of the above

146. The density of ice is less than water because of-

(a) Hydrogen bonding interaction.

(b) Dipole- dipole interaction.

(c) Dipole-induced dipole interaction.

(d) None of these.

147. The correct order of the mobility of the alkali metal ions in aqueous solution is-

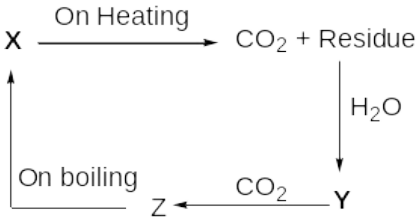
(a)$Na^+ > K^+ > Rb^+ > Li^+$

(b) $K^+ > Rb^+ > Na^+ > Li^+$

(c) $Li^+ > Na^+ > K^+ > Rb^+$

(d) $Rb^+ > K^+ > Na^+ > Li^+$

148. Identify compound 'X' in the following reaction process-



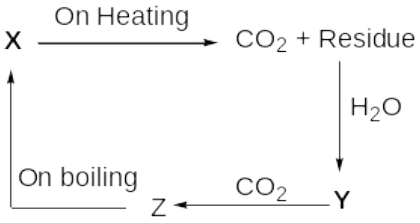
(a) $Ca(HCO_3)_2$

(b) $CaCO_3$

(c) Na_2CO_3

(d) K_2CO_3

149. In the following reaction, what is compound 'Y' ?



(a) $Ca(HCO_3)_2$

(b) $CaCO_2$

(c) $Ca(OH)_2$

(d) CaCO3

150. Among CaH_2, BeH_2 and BaH_2, the order of ionic character is-

(a) $CaH_2 < BeH_2 < BaH_2$

(b) $BeH_2 < CaH_2 < BaH_2$

(c) $BeH_2 < BaH_2 < CaH_2$

(d) $BaH_2 < BeH_2 < CaH_2$

Unit IV P-Block Elements

Q151 Which one of the following compounds on strong heating evolves ammonia gas?
(a) $(NH_4)_2SO_4$ (b) HNO_3 (c) $(NH_4)_2Cr_2O_7$ (d) NH_4NO_3

Q.152 The compound $(SiH_3)_3N$ is

(a) pyramidal and more basic than $(CH_3)_3N$

(b) planar and less basic than $(CH_3)_3N$

(c) pyramidal and less basic than $(CH_3)_3N$

(d) planar and more basic than $(CH_3)_3N$

Q.153 The correct order of acidic strength of oxy-acids of chlorine is

(a) $HClO < HClO_2 < HClO_3 < HClO_4$ (b) $HClO_4 < HClO_3 < HClO_2 < HClO$

(c) $HClO > HClO_4 > HClO_3 > HClO_2$ (d) $HClO_4 < HClO_2 > HClO_3 > HClO$

Q.154 In a molecule of phosphorus (V) oxide, there are

(a) 4P–P, 10P–O and 4P=O bonds (b) 12P–O and 4P=O bonds

(c) 2P–O and 4P=P bonds (d) 6P–P, 12P–O and 4P=P bonds

Q.155 The structures of O_3 and N_3^- are

(a) linear and bent, respectively (b) both linear

(c) both bent (d) bent and linear, respectively

Q.156 Molecular shapes of SF_4, CF_4 and XeF_4 are

(a) the same, with 2, 0 and 1 lone pairs of electrons respectively

(b) the same, with 2, 0 and 1 lone pairs of electrons respectively

(c) the different, with 0, 1 and 2 lone pairs of electrons respectively

(d) the different, with 1, 0 and 2 lone pairs of electrons respectively

Q.157 For and , the correct order of decreasing strength of hydrogen bonding is :

(a)H_2S> H_2O >HF (b) $HF > H_2O > H_2S$

(c) $HF > H_2S > H_2O$ (d) $H_2O > HF > H_2S$

Q.158 Which one of the following does not have intermolecular H-bonding?

(a) H_2O (b) *o*-nitro phenol (c) HF (d) CH_3COOH

Q159 H_3BO_3 X Y B_2O_3

if $T_1 < T_2$ then X and Y respectively are

(a) X = Metaboric acid and Y = Tetraboric acid

(b) X = Tetraboric acid and Y = Metaboric acid

(c) X = Borax and Y = Metaboric acid

(d) X = Tetraboric acid and Y = Borax

Q.160 Which of the following has not a three dimensional covalent network structure ?

(a) SiO_2 (b) Diamond (c) Graphite (d) SiC

Q.161 Which of the following statements is true?

(a) Covalent bonds are directional

(b) Ionic bonds are nondirectional

(c) A polar bond is formed between two atoms which have the same electronegativity value.

(d) The presence of polar bonds in a polyatomic linear molecule suggests that it has zero dipole moment

Q.162 The octet rule is not obeyed in :

(a) H_2O (b) NH_3 (c)PCl_5 (d) CH_4

Q.163 Which of the following oxyacids of sulphur contain S-O-O-S bonds ?

(a) H_2SO_5 (b) H_2SO_8 (c) H_2SO_3 (d) H_2SO_6

Q.164 Which of the following species is isostructural with NH_3 ?

(a) PCl_3 (b) H_2O (c) BF_3 (d) PCl_5

Q.165 Which of the following aromatic in nature?

(a) diborane (b) Borazine

(c) Sodium borohydride (d) diamond

Q.166 What is the covalency of oxygen in basic Berrylium acetate $[Be_4O(OOCCH_3)_6]$?

(a) 2 (b) 4 (c) 6 (d) 8

Q167 Basic beryllium acetate has a tetrahedral unit of

(a) Be (b) C (c) O and Be (d) C and O

Q168 The IUPAC name of basic Berrylium acetate

(a) Hexa-μ-acetato(O,O')-μ_4-oxo-tetraberyllium(II)

(b) Hexa-μ-acetato(O,O')-μ_3-oxo-tetraberyllium(II)

(c) μ-acetate-μ_3-oxo-tetraberyllium(0)

(d) All of the above

Q169 The **incorrect** regarding bonding in B_2H_6

(a) It is dimer of BH_3 (b) It contains two banana bond

(c) banana bond is also called 2e-3c bond (d) All B-H bond length are equal

Q170 The amphoteric oxide among the following is

(a) B_2O_3 (b) CO (c) SiO_2 (d) Al_2O_3

Q171 Which among the following element is said to show maximum inert pair effect?

(a) Ga (b) Pb (c) Sn (d) In

Q172 The order of boiling point of given hydride

(a) $H_2O<H_2S<H_2Se<H_2Te$ (b) $H_2Se<H_2S<H_2O<H_2Te$

(c) $H_2S<H_2Se<H_2O<H_2Te$ (d) $H_2S<H_2Se<H_2Te<H_2O$

Q173 The order of acidic nature of hydra acids is

(a) HI<HF<HCl<HBr (b) HF<HCl<HBr<HI

(c) HBr<HCl<HI<HF (d) HCl<HF<HBr<HI

Q174 The order of bond angle of hydra acids is

(a) $PH_3<NH_3<AsH_3<SbH_3$ (b) $PH_3<AsH_3<SbH_3<NH_3$

(c) $NH_3<PH_3<AsH_3<SbH_3$ (d) $SbH_3<AsH_3<PH_3<NH_3$

Q175 The correct order of stability of hydra acids is

(a) $PH_3<NH_3<AsH_3<SbH_3$ (b) $PH_3<AsH_3<SbH_3<NH_3$

(c) $NH_3<PH_3<AsH_3<SbH_3$ (d) $SbH_3<AsH_3<PH_3<NH_3$

Q.176 Borax is actually made of two tetrahedra and two triangular units joined together and should be written as:

$Na_2[B_4O_5(OH)_4]\cdot 8H_2O$

Consider the following statements about borax:

a. Each boron atom has four B–O bonds

b. Each boron atom has three B–O bonds

c. Two boron atoms have four B–O bonds while other two have three B–O bonds

d. Each boron atom has one –OH groups

Select correct statement(s):

(a) a, b (b) b, c (c) c, d (d) a, c

Q177 Which of the following ions has bond order equal to the bond order of N_2^+

(a) N_2 (b) O_2^+ (c) O_2^- (d) O_2^{-2}

Q178 The correct increasing order of boiling points of hydra acids is

(a) $PH_3<NH_3<AsH_3<SbH_3$ (b) $PH_3<AsH_3< NH_3<SbH_3$

(c) $NH_3<PH_3<AsH_3<SbH_3$ (d) $SbH_3<AsH_3<PH_3<NH_3$

Q179. The compound in which nitrogen exhibits lowest oxidation state is

(a) N_3H (b) NH_3 (c) N_2H_4 (d) NH_2OH

Q180. The correct order of the reducing strength of the given compounds is

(a) $PH_3 < NH_3 < AsH_3 < SbH_3 < BiH_3$ (b) $NH_3 < AsH_3 < PH_3 < SbH_3 < BiH_3$

(c) $NH_3 < PH_3 < AsH_3 < SbH_3 < BiH_3$ (d) $BiH_3 < SbH_3 < AsH_3 < PH_3 < NH_3$

Q181. Which of the given acids is most acidic in nature?

(a) $HClO_4$ (b) $HClO_3$ (c) $HBrO_2$ (d) HBrO

Q182. Consider the given compounds

$KMnO_4$, $K_2Cr_2O_7$, $(NH_4)_2Cr_2O_7$, $KClO_3$

The total number of the compounds those evolve oxygen gas on thermal decomposition is

(a) One (b) Two (c)Three (d)Four

Q183. The most common oxidation state of lanthanoids is

(a) +4 (b) +2 (c)+3 (d)+5

Q184. All of the given ions are coloured except

(a) Ni^{2+} (b) Cr^{2+} (c)Ti^{3+} (d)Sc^{3+}

Q185. The value of $E°(Cu^{2+}/Cu)$ for copper is +0.34 V. The reason for this value is

(a) High enthalpy of atomisation and high hydration enthalpy

(b) High enthalpy of atomisation and low hydration enthalpy

(c) Low enthalpy of atomisation and high hydration enthalpy

(d) Low enthalpy of atomisation and low hydration enthalpy

Q186. Which of the following is not a property of interstitial compounds?

(a) They retain their metallic conductivity

(b) They are chemically inert

(c) They are very hard

(d) They have less melting point as compared to the pure metal

Q187. The shape of $XeOF_4$ is

(a) Pyramidal (b) Square pyramidal

(c) Square planar (d) Bent-T

Q188. Interhalogen which is very unstable among the following is

(a) ICl (b) BrCl

(c) IF (d) IBr

Q189. Which of the given noble gases has highest positive electron gain enthalpy?

(a) Kr (b) Xe

(c) Rn (d) Ne

Q190. Which of the given chemical reaction will result in disproportionation?

(a) Reaction of chlorine with hot and conc. NaOH

(b) Reaction of chlorine with fluorine

(c) Reaction of ammonium chloride with lime

(d) Thermal decomposition of ammonium nitrate

Q191. The metal of *d*-block with the lowest melting point belongs to

(a) Group 8 (b) Group 10

(c) Group 12 (d) Group 11

Q192. Number of moles of required to oxidise 1 mol of $Na_2S_2O_3$ in faintly alkaline medium is

(a) 2.33 (b) 4.33 (c)6.67 (d)2.67

Q193. To test chloride ions, potassium dichromate is added to the compound and the mixture is acidified using sulphuric acid. The chemical formula of the compound which is obtained in the form of red vapours is

(a) CrO_2Cl_2 (b) Na_2CrO_4 (c) $Cr_2(SO_4)_3$ (d) $KHSO_4$

Q194. When sulphur is oxidised using conc H_2SO_4 the obtained major product is

(a) SO_2 (b) $H_2S_2O_8$ (c) H_2SO_4 (d) H_2S

Q195. In which oxidation state cerium acts as a good oxidising agent?

(a) +2 (b) +3 (c) +4 (d) +6

Q196. Which of the given species has higher spin only magnetic moment?

(a) Mn^{2+} (b) Mn^{+} (c) Fe^{3+} (d) Fe^{2+}

Q197. The hybridisation of phosphorus in P_4O_6 is

(a) *sp* (b) sp^2 (c) sp^3 (d) dsp^2

Q198 The increasing order of electron gain enthalpy with negative sign

(a) I < Br < F< Cl (b) I < Cl < B r<F (c) Cl < I < Br < F (d) I < Cl < F< Br

Q199 The correct statement among the following is

(a) H_2S is less acidic than H_2O. (b) H_2S is more acidic than H_2Se.

(c) NH_3 is more basic than PH_3. (d) PH_3 is more basic than SbH_3.

Q200 Which one is correct about PBr_5

(a) gas PBr_5 has sp^3 hybridization state

(b) Solid PBr_5 exist as a free covalent molecule

(c) Solid PBr_5 exists as ionic pair $[PCl_4]^+ Br^-$

(d) In Solid PBr_5 , P is in sp^3 and sp^3d^2 hybridization state