Class: 11th

Chemistry

Objective

If you prepare these MCQs then Insha Allah Confirm your 17/17 marks.

اگر آپ یہ معروضی تیار کرتے ہیں تو انشاءاللہ آپ کے 17/17 نمبر پکے ہیں۔

- **You have four choices for each objective type question as A, B, C and D. The choice which you think is correct.**

1. The number of atoms present in 0.1 mole of oxygen gas is:
(a) 6.02×10^{22} (b) 3.101×10^{23} (c) $2\times6.02\times10^{22}$ (d) 9.03×10^{22}

2. The number of Isotopes of cadmium is:
(a) 3 (b) 4 (c) 5 (d) 9

3. Nickel has isotopes:
(a) 3 (b) 5 (c) 7 (d) 2

4. The total number of fundamental particles in an atom of Carbon - 14 is:
(a) 6 (b) 8 (c) 14 (d) 20

5. Hemoglobin is a Macro Molecule and consists of approximately atoms:
(a) 5,000 (b) 10,000 (c) 68,000 (d) 15,000

6. The number of atoms in 1.79 g of gold and _______g of sodium are equal:
(a) 0.23 (b) 23 (c) 230 (d) 2300

7. The largest number of molecules are present:
(a) 3.6 g of H_2O (b) 4.8 g of C_2H_5OH (c) 2.8 g of CO (d) 5.4 g of N_2O_5

8. In Al_2O_3, the ratio between the ions is:
(a) 1:2 (b) 2:1 (c) 2:3 (d) 3:2

9. Which is not a molecular Ion?
(a) He^+ (b) CH_4^+ (c) NH_4^+ (d) CO^+

10. Tin has isotopes:
(a) One (b) Eleven (c) Fifteen (d) Eighteen

11. A pair of elements having single isotope are:
(a) ${}_9F^{19}$, ${}_{79}Au^{197}$ (b) ${}_{53}I^{127}$, ${}_{35}Br^{81}$ (c) ${}_8O^{16}$, ${}_7N^{14}$ (d) ${}_{33}As^{75}$, ${}_7N^{14}$

12. Average Atomic Mass of Neon is:
(a) 20.00 (b) 20.18 (c) 20.20 (d) 20.0

13. Number of isotopes of oxygen is:
(a) Two (b) Three (c) Four (d) Five

14. Isotopes differ in:
(a) Properties which depend upon mass (b) Arrangement of electrons in orbitals
(c) Chemical properties
(d) The extent to which they may be affected in electromagnetic field

15. One mole of SO_2 contains:
(a) 6.02×10^{23} atoms of oxygen (b) 18.1×10^{23} molecules of SO_2
(c) 6.02×10^{23} atoms of sulphur (d) 4g of atoms of SO_2

16. During combustion analysis, CO_2 Produced is absorbed in:
(a) $Mg(ClO_4)_2$ (b) 50% KOH (c) $CaCl_2$ (d) P_2O_5

17. Ascorbic acid is vitamin:
(a) A (b) B (c) C (d) D

18. 1 model of CH_3OH and C_2H_5OH have:
(a) Equal number of molecules (b) Equal number of atoms
(c) Equal number of ions (d) Equal number of protons

19. I gram formula of NaCl is equal to:
(a) 58.5 g (b) 23.5 (c) 35.5 g (d) 12 g

20. The mass of one mole of electrons is:
(a) 1.008 mg (b) 0.55 mg (c) 0.184 mg (d) 1.673 mg

21. 27 g of Al will react completely with how much mass of O_2 to produce Al_2O_3:
(a) 8 g of oxygen (b) 32 g of oxygen (c) 32 g of oxygen (d) 24 g of oxygen

22. The number of moles of CO_2 which contain 8.0 of oxygen:
(a) 0.25 (b) 0.15 (c) 0.35 (d) 1.45

23. The volume occupied by 1.4 g of N2 at S.T.P is:
(a) 2.24 dm^3 (b) 22.4 dm^3 (c) 1.12 dm^3 (d) 112 cm^3

24. The calculation based on balanced chemical equation is called:
(a) Complex calculation (b) Stoichiometric calculation
(c) Non-stoichiometric calculation (d) None of these

25. The ratio of actual yield to theoretical multiplied by 100 is called:
(a) Complex yield (b) Experimental yield (c) %age yield (d) None of these

26. A filtration process could be very time consuming if it were not aided by a gentle suction, which is developed:
(a) If the paper covers the funnel circumference up to its circumference
(b) If the paper has got small sized pores in it
(c) If the stem of the funnel is large so that it dips into the filtrate
(d) If the paper fits tightly

27. During the process of crystallization, the hot saturated solution:
(a) Is cooled very slowly to get large sized crystals
(b) Is cooled at moderate rate to get medium sized crystals
(c) Is evaporated to get the crystals of the product
(d) Is mixed with an immiscible liquid to get the pure crystals of product

28. The drying agent used in a desiccator.
(a) AgCl (b) NH_4Cl (c) P_2O_5 (d) $AlCl_3$

29. The substance used for decolourization of crystalline substance is:
(a) P_2O_5 (b) Chloroform (c) Animal Charcol (d) Soda Ash

30. Direct conversion of solid into its vapour is called:
(a) Crystallization (b) Sublimation (c) Vaporization (d) Distribution

31. Which one of the following compounds is purified by sublimation:
(a) Benzoic acid (b) SiO_2 (c) CS_2 (d) NaI

32. Which of the following compounds do not show process of sublimation?
(a) Ammonium chloride (b) Iodine (c) Naphthalene (d) Carbon tetra chloride

33. Solvent extraction is an equilibrium process and is controlled by:
(a) Law of mass action (b) The amount of solvent used
(c) Distribution law (d) The amount of Solute

34. Solvent extraction method is particularly useful technique for separation when the product to be separated is:
(a) Non-volatile or thermally unstable (b) Volatile or thermally stable
(c) Non-volatile or thermally stable (d) Volatile or thermally unstable

35. Chromatography in which the stationary phase is a solid is classified as:
(a) Partition chromatography (b) Gas Chromatography
(c) Adsorption Chromatography (d) Thin layer Chromatography

36. Borax has the chemical formula:
(a) KNO_3 (b) $NaNO_3$ (c) $Na_2B_4O_7.10H_2O$ (d) $Na_2CO_3.H_2O$

37. The unit millibar is commonly used by:
(a) Meteorologists (b) Astronauts (c) Engineers (d) Dalton

38. Temperature and number of moles are kept constant in:
(a) Boyle's law (b) Charles's law
(c) Avogadro's law (d) Dalton's law of partial pressure

39. If absolute temperature of the gas is doubled and the pressure is reduced to one half the volume of the gas will:
(a) Remains uncharged (b) Increase four times (c) Reduce to ¼ (d) Be doubled

40. Formula used for the conversion of °F into °C is:
(a) $^oF = \frac{9}{5}(^oC) + 32$ (b) $^oC = \frac{9}{5}(^oF - 32)$ (c) $^oF = \frac{9}{5}(^oC) + 32$ (d) $^oC = \frac{5}{9}(^oF - 32)$

41. Density of an ideal gas can be calculated by using equation:
(a) PV = dRT (b) PM = dPV (c) $d = \frac{RT}{MP}$ (d) PM = dRT

42. The sum of mole fraction of gas in a mixture of gases is:
(a) Always more than one (b) Always less than one
(c) Always one (d) May be less ore more than one

43. The molar volume of CO_2 is maximum at:
(a) 0^o C and 1 atm (b) 127^o C and 1 atm (c) 0^o C and 2 atm (d) 273^oC and 2 atm

44. Mass of 22.4 dm3 of N_2 at STP is:
(a) 28 gm (b) 14 gm (c) 1.4 gm (d) 2.8 gm

45. The number of molecules in one dm^3 of water is close to:
(a) $\frac{6.02}{22.4} \times 10^{23}$ (b) $\frac{12.04}{22.4} \times 10^{23}$ (c) $\frac{18}{22.4} \times 10^{23}$ (d) $55.6 \times 6.02 \times 10^{23}$

46. Partial pressure of oxygen in the air is:
(a) 156 torr (b) 157 torr (c) 158 torr (d) 159 torr

47. The S.I unit of pressure is:
(a) Torr (b) mmHg (c) Pounds $inch^{-2}$ (d) Nm^{-2}

48. Dalton's law of partial pressure can be derived from:
(a) Avogadro's (b) General gas equation All of these
(c) Charles's law (d) All of these

49. Pressure remaining constant temperature the volume of a become twice of what it is at 0°C:
(a) 546^o C (b) 200^o C (c) 546 K (d) 273 K

50. Equal masses of methane and oxygen are mixed an empty container at 25 °C. The fraction of total pressure exerted by oxygen is:
(a) 1/3 (b) 8/9 (c)1/9 (d) 16/17

51. The partial pressure of oxygen in lungs is:
(a) 760 torr (b) 320 torr (c) 159 torr (d) 116 torr

52. The spreading of fragrance of a rose or scent in air is due to:
(a) Effusion (b) Diffusion (c) Osmosis (d) Evaporation

53. The order of the rate of diffusion of gases NH_3, SO_2, Cl_2 and CO_2 is:
(a) $NH_3 > SO_2 > Cl_2 > CO_2$ (b) $NH_3 > CO_2 > SO_2 > Cl_2$
(c) $Cl_2 > SO_2 > CO_2 > NH_3$ (d) $NH_3 > CO_2 > Cd_2 > SO_3$

54. Which of the following will have highest rate of diffusion?
(a) O_2 (b) CO_2 (c) NH_3 (d) SO_2

55. Kinetic equation $PV = \frac{1}{3} m \sqrt{C^2}$ is derived by:
(a) Maxwell (b) Boltzmann (c) Clausius (d) Bernoulli

56. The deviation of gas from ideal behaviour is maximum at:
(a) -10^o C and 5.0 atm (b) -10^o C and 2.0 (c) 100^o C and 2 atm (d) 0^o C and 2.0 atm

57. The temperature of a natural plasma is about:
(a) 20000°C (b) 10000°C (c) 5000°C (d) 1000°C

58. Dipole – dipole forces are present among:
(a) Molecules of Iodine (b) Atoms of neon in gaseous state
(c) Chloroform molecules (d) CCl_4 molecules

59. Debye forces are also called:
(a) Dipole-dipole forces (b) Dipole-Induced dipole forces
(c) London forces (d) Ion-dipole forces

60. Which of the given has Hydrogen Bonding?
(a) CH_4 (b) CCl_4 (c) NH_3 (d) NaCl

61. In chloroform and acetone, how many chlorine atoms are responsible for hydrogen bonding?
(a) 1 (b) 2 (c) 3 (d) 4

62. Acetone and chloroform are soluble in each other due to:
(a) Intermolecular hydrogen bonding (b) Dipole-dipole interaction
(c) Instantaneous dipoles (d) all of the above

63. When water freezes, its volume increases:
(a) 10% (b) 9% (c) 15% (d) 18%

64. Among the given H-Bonding is maximum in:
(a) Alcohol (b) Benzene (c) Water (d) Diethyl ether

65. When water freezes at 0°C, its density decreases due to:
(a) Cubic structure of ice (b) Empty spaces present in the structure of ice
(c) Change of bond lengths (d) Change of bond angles

66. In order to mention the B.P. of water at 110°C, the external pressure should be:
(a) Between 760 torr and 1200 torr (b) between 200 torr and 760 torr
(c) 765 torr (d) Any value of pressure

67. The boiling point of glyceride at one atm is:
(a) 280°C (b) 290°C (c) 100°C (d) 110°C

68. The boiling point of water at the top of Mount Everest is:
(a) 59°C (b) 69°C (c) 83°C (d) 75°C

69. The crystal System of Sugar is:
(a) Monoclinic (b) Cubic (c) Hexagonal (d) Triclinic

70. Which one of the following is an example of cubic system?
(a) Diamond (b) Borax (c) Iodine (d) Graphite

71. The crystal system of sulphur is:
(a) Cubic (b) Hexagonal (c) Triclinic (d) Monoclinic

72. If $a \neq b \neq c$ and $\alpha = \gamma = 90°$, $\beta \neq 90°$ then crystal system is:
(a) Monoclinic (b) Diclinic (c) Triclinic (d) Polyclinic

73. Which is pseudo solid?
(a) CaF_2 (b) Glass (c) NaCl (d) $CaCl_2$

74. Transition temperature of KNO_3 is:
(a) 13.2 °C (b) 95.5 °C (c) 128 °C (d) 32.2 °C

75. Crystal of diamond is:
(a) Ionic (b) Covalent (c) Molecular (d) Metallic

76. The Lightest value of Lattice energy is for which one of these ionic compounds:
(a) NaI (b) NaF (c) NaBr (d) NaCl

77. Ionic solids are characterized by:
(a) Low melting point (b) Good conductivity in solid state
(c) High vapours pressure (d) Solubility in polar solvent

78. Diamond is bad conductor because:
(a) It has a tight structure (b) It has a high density (c) It is transparent to light
(d) There are no free electrons present in the crystal of diamond to conduct electricity

79. Cathode rays strike alumina and produce a .... colour.
(a) Red (b) Blue (c) Yellow (d) Green

80. Positive rays were discovered by:
(a) J.J Thomson (b) Goldstein (c) William Crookes (d) Ruther ford

81. The nature of positive rays depends on:
(a) The nature of electrode (b) The nature of discharge tube
(c) The nature of residual gas (d) All of the above

82. The e/m value for the positive rays in maximum for the gas.
(a) Hydrogen (b) Helium (c) Oxygen (d) Nitrogen

83. When fast neutron carries nuclear reaction with nitrogen it ejects particles:
(a) α (b) β (c) γ (d) δ

84. Mass of an electron is:
(a) 9.1095×10^{-31} kg (b) 6.022×10^{22} (c) 6.022×10^{-22} (d) 10.10×10^{30}

85. Rutherford's model of atom failed because:
(a) The atom did not have a nucleus and electrons
(b) It did not account for the attraction between protons and neutrons
(c) It did not account for stability of the atom
(d) There is actually no space between the nucleus and the electrons

86. Bohr Model of atom is contradiction by:
(a) Plank's quantum theory (b) Dual nature
(c) Heisen berg's principle (d) Paul's exclusion principle

87. In the ground state of an atom, the electron is present:
(a) In the nucleus (b) In the second shell
(c) Nearest to the nucleus (d) Farthest from the nucleus

88. The velocity of photon is:
(a) Independent of its wavelength (b) Depends on its wavelength
(c) Equal to square of its amplitude (d) Depends on its source

89. Lyman series lies in spectral region:
(a) Infrared (b) Ultra violet (c) Visible (d) None of these

90. Splitting of spectra lines when atoms are subjected to strong electric field is called:
(a) Zeeman effect (b) Stark effect (c) Photoelectric effect (d) Compton effect

91. De-Broglie equation is represented by:
(a) $h = \frac{\lambda}{mv}$ (b) $m = \frac{h}{\lambda v}$ (c) $m = \frac{\lambda}{hv}$ (d) $\lambda = \frac{h}{mv}$

92. Quantum number values for 2p orbitals / subshell are:
(a) n = 2, I = 1 (b) n = 1, I = 2 (c) n = 1, I = 0 (d) n = 2, I = 0

93. An orbital which is spherical and symmetrical is:
(a) s – orbital (b) p - orbital (c) d - orbital (d) f – orbital

94. Orbitals having same energy are called:
(a) Hybrid orbitals (b) Valence orbitals (c) Degenerate orbitals (d) d - orbitals

95. n + I value of 6d orbital is:
(a) 08 (b) 09 (c) 10 (d) 11

96. Most stable electronic configuration is of a / an:
(a) Noble Gas (b) Electronegative Element (c) Alkali Metal (d) Halogen

97. When 6d orbital is complete, the entering electron goes into:
(a) 7f (b) 7s (c) 7p (d) 7d

98. The element which has maximum numbers of unpaired electron is:
(a) Cr_{24} (b) Ca_{20} (c) F_{26} (d) CH_{29}

99. Octet rule is not followed in the formation of:
(a) NF_3 (b) CF_4 (c) CCl_4 (d) PCl_3

100. Which compound does not obey the octet rule?
(a) NH_3 (b) BCl_3 (c) H_2O (d) CH_4

101. The covalent radius of Cl-atom is:
(a) 99.4 pm (b) 80 pm (c) 70 pm (d) 66.4 pm

102. Which element has highest ionization potential?

(a) Li (b) Be (c) B (d) C

103. The amount of energy released by absorbing electron in the valence shell is:
(a) Ionization energy (b) Electron affinity
(c) Electronegativity (d) Atomization energy

104. In methanol, bond between carbon and oxygen:
(a) Ionic (b) Non-Polar (c) Polar (d) Co-ordinate

105. Which of the following has coordinate covalent bond:
(a) NH_4Cl (b) NaCl (c) HCl (d) $AlCl_3$

106. Among the following quantum a pair of molecules having similar geometry:
(a) BF_3, NH_3 (b) BF, Alf_3 (c) BeF_2, H_2O (d) BCl_3, PCl_3

107. The geometry of SO_2 molecule is:
(a) Angular (b) Linear (c) Tetrahedral (d) Trigonal pyramid

108. Beryllium dichloride follows hybridization:
(a) sp (b) sp^3 (c) sp^3 (d) sp^3d^2

109. The shape of $SnCl_2$ molecule is:
(a) Linear (b) Angular (c) Trigonal planar (d) Tetrahedral

110. The structure of water molecule is:
(a) Angular (b) Linear (c) Trigonal (d)Trigonal pyramidal

111. Orbitals having same energy are called:
(a) Hybrid orbitals (b) Valence orbitals (c) Degenerate orbitals (d) d-orbitals

112. The bond angle in NH_3 molecules is:
(a) 109.5° (b) 107.5° (c) 104.5° (d) 108°

113. The hybridization in ammonia molecule is:
(a) dsp^2 (b) sp^2 (c) sp^3 (d) sp

114. The number of bonds in nitrogen molecule is:
(a) 1 (b) 2 (c) 3 (d) 4

115. Dipole moment of CO_2 is:
(a) 1.25 D (b) 1.85 D (c) 3.1 D (d) Zero

116. Dipole Moments and Molecular Structure 35. Which of the hydrogen halide has the highest percentage of ionic character?
(a) HCl (b) HBr (c) HF (d) HI

117. ______ molecule has zero dipole moment:
(a) CO (b) H_2S (c) SO_2 (d) CH_4

118. If an endothermic reaction is allowed to take place very rapidly in the air, the temperature of the surrounding air:
(a) Remains constant (b) Increases (c) Decreases (d) Remain unchanged

119. In endothermic reactions, the heat content of the:
(a) Products is more than that of reactants (b) Reactants is more than that of products
(c) Both a and b (d) Reactants and products are equal

120. Which of these is not a state function?
(a) Temperature (b) Pressure (c) Volume (d) Heat

121. The net heat change in a chemical reaction is same whether it is brought about in two or more different ways in one or several steps. It is known as:
(a) Henry's Law (b) Hess's Law
(c) Joule's Principle (d) Law of conservation of energy

122. The change in heat contents of a chemical reaction at constant temperature and pressure is called:
(a) Enthalpy change (b) Bond Energy
(c) Heat of Sublimation (d) Internal Energy Change

123. The change in heat energy of a chemical reaction at constant temperature and pressure is called:
(a) Enthalpy Change (b) Bond energy
(c) Heat of sublimation (d) Internal energy change

124. The pressure of oxygen inside the bomb calorimeter is:
(a) 100 atm (b) 50 atm (c) 25 atm (d) 20 atm

125. One Calorie is equivalent to: OR One thermal calorie is equivalent to:
(a) 0.4184 J (b) 41.84 J (c) 4.184 J (d) 418.4 J

126. $\Sigma \Delta H$ (cycle) = 0 The above law is known as:
(a) Henry's Law (b) Hess's Law (c) Kohlarus Law (d) Darwins Law

127. The optimum temperature for the synthesis of NH_3 by Haber's process is:
(a) 200 °C (b) 300 °C (c) 400 °C (d) 500 °C

128. ______ was derived by C.M. guldberg and P. Waage in 1864:
(a) Law of Conservation of Mass (b) Law of Mass Action
(c) Distribution Law (d) Law of Conservation of Energy

129. The reaction which proceeds in both forward and backward direction is called:
(a) Irreversible reaction (b) Reversible reaction
(c) Spontaneous reaction (d) Non Spontaneous reaction

130. Optimum pressure in Haber's process for synthesis of Ammonia is:
(a) 100 – 150 atm (b) 200 – 300 atm
(c) 350 – 450 atm (d) 500 – 600 atm

131. The pH of 10-4 moles / dm3 of $Ba(OH)_2$ is:
(a) Law of Conservation of Mass (b) Law of Mass Action
(c) Distribution Law (d) Law of Conservation of Energy

132. The pH of 10-4 moles / dm^3 of $Ba(OH)_2$ is:
(a) 4.5 (b) 6.4 (c) 7.5 (d) 10.3

133. The value of Kw at 25°C is: **OR** The value of ionic product (Kw) of water at 25°C is:
(a) 0.11×10^{-14} (b) 0.30×10^{-14} (c) 1×10^{14} (d) 3×10^{-14}

134. The pH of human blood is maintained at pH:
(a) 7.4 (b) 7.3 (c) 7.00 (d) 8.00

135. Sum of pKa and pKb is equal to:
(a) 7 (b) 1 (c) 14 (d) 0

136. By adding NH_4Cl to NH4OH solution. The ionization of NH_4OH:
(a) Increases (b) Remains same (c) Decreases (d) Increases 100 times

137. The pH of buffers can be calculated by:
(a) Henderson equation (b) Nerst equation
(c) Kinetic equation (d) Arrhenius equation

138. Relative lowering of vapour pressure is equal to:
(a) Mole fraction of solute (b) Mole fraction of solvent (c) Molarity (d) Molality

139. A thermometer used in Landsberger's method can read up to:
(a) 0.1 K (b) 0.01 F (c) 0.01 K (d) 0.01°C

140. 18 g glucose is dissolved in 90g of water. The relative lowering of vapour pressure is equal to:
(a) 5 (b) 5.1 (c) $\frac{1}{51}$ (d) 6

141. A solution of glucose is 10% w/v. The volume in which 1 g mole of it is dissolved will be:
(a) 1 dm^3 (b) 1.8 dm^3 (c) 200 cm^3 (d) 900 cm^3

142. An aqueous solution of ethanol in water may have vapour pressure: OR
An aqueous solution of ethanol in water has vapour pressure:
(a) equal to that of water (b) equal to that of ethanol
(c) more than that of H_2O (d) less than that of water

143. Which of the following solutions has the highest boiling point?

(A) 5.85% solution of sodium chloride (B) 18.0% solution of glucose
(C) 6.0% solution of urea (D) All have the same boiling point

144. The oxidation number of C in $C_{12}H_{22}O_{11}$ is:
(a) Zero (b) -6 (c) +6 (d) 12

145. The oxidation number of O-atom in OF_2 is:
(a) -2 (b) +2 (c) -1 (d) +1

146. Which of the following statements is correct about Galvanic cell?
(a) anode is negatively charged (b) reduction occurs at anode
(c) cathode is positively charged (d) reduction occurs at cathode

147. The reduction potential of Zn is:
(a) +0.76 V (b) -0.34 V (c) +0.34 V (d) -0.76 V

148. The standard redox potential of following reaction is $Zn_2+ + 2e- \rightarrow Zn$:
(a) -0.76 V (b) 2.87 V (c) -0.026 V (d) -3.045

149. The cathodic reaction in the electrolysis of dil. H_2SO_4 with Pt electrodes is:
(a) reduction (b) oxidation
(c) both oxidation and reduction (c) neither oxidation nor reduction.

150. Stronger the oxidizing agent, greater is the:
(a) Oxidation potential (b) reduction potential (c) redox potential (d) E.M.F of cell

151. If the salt bridge is not used between two half cells, then the voltage.
(a) decrease rapidly (b) decrease slowly (c) does not change (d) drops to zero.

152. If a strip of Cu metal is placed in a solution of $FeSO_4$:
(a) Cu will be precipitated down (b) Fe is precipitated out
(c) Cu and Fe both dissolve (d) No reaction takes place.

153. The unit of rate constant is the same as that of the rate of reaction is:
(a) First order reaction (b) Second order reaction
(c) Zero-order reaction (d) Third order reaction

154. The unit of rate constant is the same as that of the rate of reaction in:
(a) First order reaction (b) Second order reaction
(c) Zero-order reaction (d) Third order reaction

155. In zero order reaction, the rate is independent of:
(a)Temperature of reaction (b) Concentration of reactants
(c) Concentration of products (d) None of these

156. If the rate equation of a reaction 2A+B→ products is, rate = K[A]2 [B], and A is present in large excess, then order of reaction is:
(a) 1 (b) 2 (c) 3 (d) none of these

157. The rate of reaction _______as the reaction proceeds.
(a) Increases (b) Decreases (c) Remains the same (d) May decrease

158. With increase in 10°C temperature, the rate of reaction doubles. This increase in rate of reaction is due to:
(a) Decrease in activation energy of reaction
(b) Decrease in the number of collisions between reactant molecules.
(c) Increase in activation energy of reactants
(d) increase in number of effective collisions.

159. Unit of rate constant is the same as that of the rate of reaction in:
(a) Zero order reaction (b) 1st order Reaction
(c) 2nd order Reaction (d) 3rd order reaction.

160. Glucose can be converted into ethanol by an enzyme:
(a) Lipase (b) Zymase (c) Sucrose (d) Urease

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Subjective part

If you prepare these Short and long Questions then Insha Allah Confirm your A+ marks

اگر آپ یہ مختصر سوالات اور تفصیلی سوالات تیار کرتے ہیں تو انشاءاللہ آپ کے A+ نمبر پکے ہیں۔

Section-I

Question No. 2

1. Define molecular ion, write its uses.
2. Why we use the term relative atomic mass?
3. Calculate the percentage of Nitrogen in urea.
4. What are isotopes? Why they have same chemical but different physical properties?
5. Define isotopes why they have same chemical properties?
6. Explain mathematical relationship of m/e of an ion in mass spectrometry.
7. How does no individual neon atom in the sample of the element has mass 20.18 amu?
8. Write functions of Mg $(ClO_4)_2$ and KOH in combustion analysis.
9. Why oxygen cannot be determined directly in combustion analysis?
10. Differentiate between empirical and molecular formula.
11. A compound may have same molecular and empirical formula, Justify.
12. Define molecular formula. How is it related with empirical formula?
13. Define limiting reactant. Give an example.
14. Many chemical reactions taking place in our surrounding involve limiting reactants. Give reason
15. Define actual yield. Write formula for the calculation of % age yield.
16. Why actual yield is always less than theoretical yield?
17. Why we calculate % age yield?
18. Law of conservation of mass has to be obeyed during stoichiometric calculations. Explain?
19. Define empirical formula and molecular formula with examples.
20. Give assumptions of stoichiometry.
21. Magnesium atom is twice heavier than carbon atom. Comment.
22. How one mg of K_2CrO_4 has thrice the number of ions than the number of formula units when ionized.
23. How 4.9 g of H_2SO_4 when completely ionized in water have equal number of +ve and –ve charges but the number of positively charged ions are twice the number of negatively charged ions.
24. 23 g of sodium and 39 g of potassium have equal number of atoms in them. Justify.
25. What is Avogadro's number? Give equation to relate the Avogadro's number and mass of element.
26. How N_2 and CO have same number of electrons, protons and neutrons.
27. Why do 2 g of H_2, 16g of CH_4, 44g of CO_2 occupy separately the volume of 22.414 dm^3 although the sizes and masses of molecules of three gases are very different from each other?
28. Write any four properties of liquids.
29. Give two statements of Boyle's Law.
30. Define absolute zero. What is its value?
31. Define atmospheric pressure. Give its two units.

32. Calculate the value of gas constant "R" in S.I. units.
33. Prove that $d = \frac{PM}{RT}$
34. Derive Avogadro's Law from kinetic molecular theory of gases.
35. Derive an expression to find out the partial pressure of gas.
36. Regular air cannot be used in diver's tank. Give reasons.
37. Why pilots feel uncomfortable breathing in unpressurised cabin?
38. Lighter gases diffuse more rapidly than heavier gases. Give reason.
39. Derive Boyle's law from KMT.
40. Give general principle of Liquefaction of gases.
41. What is plasma? Write its one / four application.
42. Justify that SO_2 is comparatively non-ideal at 273K but behaves ideally at 327°C.
43. Define Slow Neutron and Fast Neutron.
44. Calculate mass of an electron when $e/m = 1.758 \times 10^{11}$ C. Kg^{-1}
45. How charge to mass (e/m) ratio of electron in measured?
46. What is Planck's quantum theory?
47. Differentiate between frequency and wave number.
48. Write postulates of Bohr's atomic model
49. Why the electrons move faster in an orbit of smaller radius?
50. Why the potential energy of an electron is negative in an orbit of atom?
51. Differentiate between continuous and line spectrum.
52. What is the origin of Line Spectrum?
53. Differentiate between atomic emission spectrum and atomic absorption spectrum.
54. What is atomic emission spectrum?
55. Why the radius of an atom cannot be determined precisely?
56. Write names of spectral series of hydrogen spectrum.
57. What is meant by fine structure of Hydrogen Spectrum?
58. Differentiate between Zeeman effect and stark effect.
59. Mention two defects of Bohr's model.
60. State Moseley's writes its mathematical equation.
61. How the dual nature of an electron was verified?
62. state Heisenberg un-certainty principle and give its mathematical form / equation.
63. What is un-certainty principle?
64. Define Heisenberg's principle of uncertainty.
65. What is azimuthal quantum number? Give its significance.
66. Define Pauli's exclusion principle. Give one example.
67. Give the postulates of Bohr's atomic model.
68. What is spectrum? Differentiate between continuous spectrum and line spectrum.
69. What is thermochemical equation? Give example.
70. What is the difference between heat and temperature?
71. Differentiate between endothermic and exothermic reactions. Give one example of each.
72. Differentiate between spontaneous and non-spontaneous reactions.
73. Spontaneous reactions are exothermic in nature explain.
74. Describe that burning of candle is a spontaneous process. Justify.
75. Define system and surrounding. Show by diagram of any one example.
76. Differentiate between system and surroundings.

77. Define with example system and state function.
78. Differentiate between spontaneous and non-spontaneous reactions.
79. What do you know about internal energy of system?
80. Define heat of solution. Give one example.
81. Explain the term enthalpy.
82. Define enthalpy of formation with one example.
83. Define standard enthalpy of atomization with an example.
84. ΔH neutralization of strong acid with strong base always remains constant.
85. With the help of an example, explain enthalpy of neutralization.
86. Define standard enthalpy of combustion. Give one example.
87. Define enthalpy of solution with an example.
88. Define Born-Haber cycle and Lattice energy.
89. What do you know about internal energy of system?
90. Define standard enthalpy of atomization with an example.
91. What is standard enthalpy of solution? Give one example.
92. State first law of thermodynamics. Give its mathematical formula.

Question No. 3

1. What is difference between Gooch's crucible and Sintered glass crucible?
2. Why sintered glass crucible is preferred over Gooch crucible?
3. Explain filtration through Gooch Crucible?
4. Define Crystallization. What is basic principle of crystallization?
5. Write four Properties of metallic crystal?
6. What are liquid crystals? Why are they so called?
7. Write down any two methods of drying of the crystals.
8. Define sublimation with an example.
9. Define sublimation what type of a substance can be purified by this technique.
10. Define distribution law. How it is helpful in solvent extraction?
11. What is solvent extraction? Give its importance.
12. Define chromatography. Give its two uses.
13. What is difference between adsorption and partition chromatography?
14. What is mobile phase and stationary phase?
15. Write down the uses of chromatography.
16. What is R_f value? Why it has no units?
17. What is dipole-dipole forces of attraction? Explain with an example.
18. What are Debye forces? Explain.
19. Define hydrogen bonding. Show hydrogen bonding in ammonia molecule.
20. Describe cleaning action of soaps and detergents on the basis of H-bonding.
21. Ethyl alcohol can dissolve in water but- hydrocarbons are not soluble in water. Justify it.
22. Lower alcohols are soluble in water but hydrocarbons are insoluble. Give reason.
23. One feels sense of cooling under the fan after bath. Why?
24. Define Evaporation and name the factors which affect evaporation.
25. Why the boiling points of noble gases increase down the group?
26. What are liquid Crystals? Why are they so called?
27. How the liquid crystals, help in the detection of the blockage in Veins and arteries?
28. Write four properties of solids.

29. Define crystalline solids and crystallites.
30. Amorphous solid like glass is also called super cooled liquid. Explain.
31. Define Polymorphism and Anisotropy. Give one example of each.
32. Differentiate between isomorphism and polymorphism.
33. Define symmetry and habit of a crystal.
34. Write four properties of Metallic crystals.
35. The Electrical Conductivity of metals decreases conductivity of a metal with the rise of temperature.
36. Define rate of a chemical reaction and give its units.
37. Define specific rate constant. Give equation to support your answer.
38. What is order of reaction? Give two examples.
39. What is zero order of reaction? Give one example.
40. The radioactive decay is always a first order reaction. Give reason.
41. Define with example 2nd order reaction?
42. What is specific rate constant or velocity constant?
43. What is half-life period? Give example.
44. What do you mean by rate determining step? Give example.
45. How surface area affects the rate of reaction? Give one example.
46. Define activation energy and activated complex.
47. How does a catalyst affect a reversible reaction?
48. What is the effect of temperature on the rate of a reaction?
49. How enthalpy change of a reaction and energy of activation are distinguished?
50. Define homogeneous catalysis. Give two examples.
51. What is catalytic poisoning? Give two examples.
52. What are enzymes? How they act as catalysts?
53. Write down any two characteristics of enzyme catalysis.
54. Enzymes are specific in action. Justify.
55. What is auto catalysis? Give example to support answer.
56. What is molarity? Calculate the molarity of a solution containing 9g of glucose in 250 cm^3 of solution.
57. How molality is independent of temperature, but molarity depends on temperature?
58. One molal solution of glucose is dilute as compared to one molar solution of glucose. Justify it?
59. Why 1 molal solution of NaOH is dilute as compared to one molar solution?
60. One molal solution of urea is dilute as compared to one molar solution of urea. Justify it?
61. Define Ebullioscopy constant with example.
62. How will you justify that lowering of vapor pressure is a colligative property?
63. Relative lowering of vapor pressure is independent of temperature. Justify it.
64. Justify that boiling points of solvents increase due to presence of non-volatile solutes.
65. Depression of freezing point is a colligative property. Justify it.
66. Give two applications of Colligative properties.
67. Why NaCl and KNO_3 are used to lower the melting points of ice?
68. Why is Beckman's thermometer used to find the depression in freezing point?
69. Differentiate between ideal and non-ideal solutions.
70. Define heat of solution.
71. What is meant by water of crystallization? Give an example.
72. What are zeotropic and azeotropic mixtures?

73. Differentiate between molarity and molality.
74. Define upper consulate temperature. Give two examples.
75. Differentiate between hydration and hydrolysis.
76. Why the solubility of glucose into water increases by increasing temperature?
77. State Raoult's law. Give its mathematical equation.
78. What is fractional crystallization?
79. Aqueous solution of $CuSO_4$ is acidic in nature. Justify it.
80. Aqueous solution of CH_3COONa is basic in nature.
81. What is continuous solubility curve? Which solutions give this type of curve?
82. What are discontinuous solubility curves?

Question No. 4

1. Explain the term reversible reaction and state of equilibrium.
2. How the direction of a reversible reaction at any instant can be determined by Kc value?
3. State Le-Chatelier's principle. And discuss the effect of change in concentration of a product on reversible reaction.
4. How does change of pressure shifts the equilibrium position in the synthesis of ammonia?
5. How the equilibrium constant Kc predicts the direction of a reversible reaction?
6. The solubility of glucose in water is increased by increasing the temperature. Explain.
7. Define pH. How it is helpful to know the nature of solution?
8. Define ionic product of water and what is its value at $30^{o}C$.
9. Define pH and pOH.
10. Calculate the pH of 10^{-4} mol dm^{-3} solution of $Ba(OH)_2$.
11. How do the buffers act? Give example.
12. How does the catalyst affect the equilibrium constant?
13. What do you mean by Buffer capacity?
14. Write two applications of equilibrium constant?
15. Write two uses of buffer solutions.
16. Give two applications of solubility product.
17. Write Handerson's equations for acidic and basic buffers?
18. What are buffer solutions? How a basic buffer can be prepared?
19. Define solubility product. Derive solubility product expression for Ag_2CrO_4?
20. How change in volume disturbs the equilibrium position for some of the gas phase reactions but notthe equilibrium constant?
21. How does a catalyst affect a reversible reaction?
22. What is the formula to calculate the percentage ionization of weak acids?
23. Define Lowry-Bronsted concept of acids and bases?
24. Why solid ice at $0^{o}C$ can be melted by applying pressure without supply of heat from outside.
25. Write the relationship of Kp with Kc.
26. Give applications of common ion effect (any two).
27. What is difference between metallic conduction and electrolytic conduction?
28. Differentiate between electrolytic cell and galvanic cell.
29. Explain how impure copper can be purified by electrolytic process.
30. Give two applications of electrochemical series.
31. A salt bridge maintains the electrical neutrality in the cell. Explain.
32. Write down the function of salt bridge?

33. A porous plate or a salt bridge is not required in lead acid storage battery.
34. Define electrochemical series.
35. Write down two functions of salt bridge in a galvanic cell?
36. Describe Nickle-Cadmium cell.
37. What is standard electrode potential?
38. Calculate the oxidation number of Mn in $KMnO_4$.
39. Calculate the oxidation number of Mn in $KMnO_4$ and Na_2MnO_4.
40. Calculate the oxidation number of S in $Cr_2(SO_4)_3$ and SO_4^{2-}.
41. What is difference between electrolytic cell and voltaic cell?
42. How fuel cells produce electricity?
43. Write two advantages of fuel cells.
44. Give the chemistry of electrolysis of aqueous solution of sodium chloride.
45. What is electrolysis? Give example.
46. Write recharging of lead accumulator battery.
47. Lead accumulator is a chargeable battery. Justify.
48. What is Standard Hydrogen Electrode (SHE).
49. Draw diagram of Standard Hydrogen Electrode (SHE).
50. SHE acts as anode when connected with Copper but as cathode with Zinc. Support your answer with equations.
51. What is alkaline battery?
52. How anodized aluminum is prepared in an electrolytic cell?
53. Define anode and cathode.
54. Why is the radius or size of a cation smaller than its parent atom?
55. Write down the two postulates of VSEPR.
56. Explain the geometry of H_2S on the basis of VSEPR.
57. Why the radius of an atom can't be determined precisely?
58. What is octet rule? Give two examples of compounds which deviate from it.
59. 75.4 pm is the compromised distance between the bonded hydrogen atoms. Justify.
60. Bond distance is the compromised distance between the two atoms. Justify.
61. Distinction between covalent and coordinate covalent bond vanishes after bond formation.
62. Why the ionic radius is greater than atomic radius?
63. State electronegativity and electron affinity.
64. Why is the radius of a cation smaller than its parent atom?
65. Differentiate between covalent bond and coordinate covalent bond.
66. Why the energy of anti-bonding molecular orbital is higher than corresponding bonding molecular orbital?
67. How does ionization energy vary in periodic table?
68. Ionization energy is an index to the metallic nature of an element. Justify.
69. What is Bond order? Give an example.
70. Draw M.O.T diagram of Hydrogen molecule showing its bonding and antibonding molecular orbitals.
71. Differentiate between atomic orbital and molecular orbital.
72. Define sigma bond and pi bond.
73. π bonds are more diffused that bonds 6 bonds. Why?
74. Define electronegativity. Give its trend in the periodic table.
75. Why is no bond in chemistry 100% ionic?

76. Define atomic orbital hybridization.
77. State the geometry of ammonia molecule on the basis of VSEPR theory.
78. Define Dipole moment and give its S.I units.
79. Why the dipole moment of CO_2 is Zero but that of SO_2 is 1.61 D?
80. Why BF_3 is non-polar but SO_2 is polar?
81. Write two points of Valence bond theory.
82. Why ionization energy decreases down the group although nuclear charge increases. Explain.
83. Define ionization energy (potential). Give its trends in the periodic table.
84. Why it is impossible for CH_4 to make a coordinate covalent bond with H^+ ion while water and ammonia can do so?
85. Why the lone pairs of electrons occupy more space than bond pairs?
86. Why ionic compounds do not show the phenomenon of isomerism, but covalent compounds do?
87. How the type of bonding affects the solubility of compounds.

Long Questions

Section-II

Question No. 5

1. What is mass spectrometer? How it is used to determine the relative atomic mass?
2. Write down various steps to calculate the empirical formula of a compound.
3. Explain combustion analysis of an organic compound along with diagram.
4. What is stoichiometry? Give its assumptions? Mention two important laws, which help to perform the stoichiometric calculations?
5. What is a limiting reactant? How does it control the quantity of the product formed?
6. What are the factors which are mostly responsible for the low yield of the products in chemical reactions?
7. Helium gas in a 100 cm^3 container at a pressure of 500 torr is transferred to a container with a volume of 250 cm^3. What will be the new pressure if not change in temperature occurs?
8. A sample of krypton with a volume of 6.25 dm3, a pressure of 765 torr and a temperature of 20 ^oC is expanded to a volume of 9.55 dm3 and a pressure of 375 torr. What will be its final temperature in ^oC?
9. Working at a vacuum line, a chemist isolated a gas in a weighing bulb with a volume of 255 cm^3, at a temperature of 25^oC and under a pressure in the bulb of 10.0 torr. The gas weighted 12.1 mg. What is the molecular mass of this gas?
10. A sample of nitrogen gas in enclosed in a vessel of volume 380 cm^3 at 120 ^oC and pressure of 101325 Nm^{-2}. This gas is transferred to a 10 dm3 flask and cooled to 27 ^oC. Calculate the pressure in Nm-2 exerted by the gas at 27 ^oC.
11. Helium gas in a 100 cm3 container at a pressure of 500 torr is transferred to a container with a volume of 250 cm^3.What will be the new pressure if its temperature changes from 20^o C to 15^o C?
12. One mole of methane gas is maintained at 300K. Its volume is 250cm^3 calculate the pressure exerted by gas considering that it is behaving as non-ideal. a = 2.253 atm. dm6.mol-2 b = 0.0428 dm3mol-1
13. A sample of krypton gas with a volume of 6.25 dm3, a pressure of 765 torr and temperature of 20 ^oC is expanded to a volume of 9.55 dm3 and a pressure of 375 torr. What will be the new temperature in ^oC?

Question No. 6

1. Explain hydrogen bonding in NH3, H2O and HF. How is it helpful in explaining the structure of ice?
2. What is boiling point? What is the effect of external pressure on the boiling point? Why the temperature remains constant at boiling point although heat is continuously supplied.
3. What are ionic solids? Give their properties in details.
4. What are liquid crystals? Give their uses in daily life.
5. What are molecular solids? Give their important characteristics?
6. What is vapor pressure of a liquid? Also discuss its measurement by Manometric method and draw diagram.
7. Give Postulates of Kinetic Molecular theory (K.M.T).
8. Define and explain Hess's law and give its applications.
9. State Hess's Law of constant heat summation. Explain it giving two examples.
10. State 1st law of thermodynamics. Prove that $\Delta E=q_v$
11. State 1st law of thermodynamics. How does it explain that $\Delta H=q_p$?
12. Define Enthalpy of reaction. How is it measured by Glass Calorimeter?
13. Explain Bomb Calorimetric method for the measurement of enthalpy of reaction. Also draw diagram.
14. Explain the following terms;
15. Standard heat of neutralization
16. standard enthalpy of solution

Question No. 7

1. Write four defects of Bohr's atomic model.
2. Derive an expression to determine the radius of an orbit using Bohr Model.
3. Describe Millikan's oil drop method for the measurement of charge on electron.
4. Define Quantum numbers. Discuss briefly Azimuthal quantum number.
5. Give properties of neutron in detail (any four).
6. Write down the experiment how neutron was discovered.
7. Describe J.J Thomson's experiment for determining e/m value of electron.
8. Calculate the pH of buffer solution in which 0.11 molar $H_3CCOONa$ and 0.09 molar acetic acid solutions are present Ka for $H_3CCOONa$ is 1.85×10^{-5}.
9. $N_{2(g)}$ and $H_{2(g)}$ combine to give $NH_{3(g)}$. The value of K_c in this reaction at 500C° is 6.0 x 10^{-2} calculate the value of K_p for this reaction.
10. Benzoic acid, C_6H_5COOH, is a weak mono basic acid (K_a = 6.4 x 10^{-5}moldm^{-3}).What is the pH of a solution containing 7.2 g of sodium benzoate (C_6H_5COONa) in one dm^3 of 0.02 mol dm^{-3} benzoic acid? (Atomic masses Na: 23, C:12)
11. Ca $(OH)_2$ is a sparingly soluble compound. Its solubility product is 6.5 x 10^{-6}. Calculate the solubility of Ca $(OH)_2$. (Atomic mass: Ca = 40).
12. The solubility of CaF_2 in water at 25°C is found to be 2.05 x 10^{-4} mole dm^{-3}. What is the value of K_{sp} at this temperature?

Question No. 8

1. Write the main postulates of VSEPR theory and explain the structure of Ammonia on the basis of this theory.
2. Explain the structure of ethyne according to hybridization concept.
3. Explain sp^3 hybridization by taking example of Methane (CH_4).
4. What is sp^2 hybridization. Explain the structure of ethene?
5. Explain the molecular orbital structure of following molecules on the basis of MOT. N_2
8. Define electrochemical series? Explain its any three applications.
9. How electrochemical series is helpful in the prediction of feasibility of chemical reaction and relative chemical reactivity of metals?
10. Explain the structure and function of voltaic or galvanic cell.
11. How can you measure electrode potential of an element using standard hydrogen electrode (SHE)?

and O_2 molecule.

6. Define dipole moment. Give its units. How is it used to determine the geometry of molecule? Give an example.
7. Define ionization energy. Write factors affecting. Define factors affecting it and trends in the periodic table.
12. What is standard hydrogen electrode (SHE)? How it is used to measure the electrode potential of Zinc.
13. Describe the electrolysis of molten sodium chloride and a concentrated aqueous solution of sodium chloride.

Question No. 9

1. Define Solubility curves. Explain continuous and discontinuous solubility curves. 2021,2022
2. Give graphical explanation of boiling point elevation of solution.
3. What are Colligative properties of solutions? Explain elevation of boiling point.
4. State and explain Raoult's law in three forms.
5. State different forms of Raoult's law. How can this law help us to understand the ideality of a solution?
6. What are ideal solutions? Explain the fractional distillation of ideal mixture of two liquids.
7. Differentiate between ideal and non-ideal solutions.
8. Explain the energy of activation.
9. How does Arrhenius equation help us to calculate the energy of activation of a reaction?
10. Define half-life period. Describe half-life method for the determination of order of reaction.
11. Define order of reaction and explain 2nd order and zero order reactions.
12. Define Order of reaction. Describe it with three examples.
13. Write a brief note on the following:
14. Homogeneous catalysis
15. Heterogeneous catalysis
16. What are enzymes? Write any four characteristics of enzyme catalysis.