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CHEMISTRY

SOME BASIC CONCEPTS OF CHEMISTRY

Single Correct Answer Type

- Weight of oxygen in one mole each of Fe_2O_3 and FeO is in the simple ratio of:
a) 3 : 2 b) 1 : 2 c) 2 : 1 d) 3 : 1
- Equivalent weight of a bivalent metal is 37.2. The molecular weight of its chloride is
a) 412.2 b) 216 c) 145.4 d) 108.2
- 0.0833 mole of carbohydrate of empirical formula CH_2O contain 1 g of hydrogen. The molecular formula of the carbohydrate is
a) $\text{C}_5\text{H}_{10}\text{O}_5$ b) $\text{C}_3\text{H}_4\text{O}_3$ c) $\text{C}_{12}\text{H}_{22}\text{O}_{11}$ d) $\text{C}_6\text{H}_{12}\text{O}_6$
- The equivalent weight of $\text{Zn}(\text{OH})_2$ in the following reaction is equal to its,
 $\text{Zn}(\text{OH})_2 + \text{HNO}_3 \rightarrow \text{Zn}(\text{OH})(\text{NO}_3) + \text{H}_2\text{O}$:
a) $\frac{\text{Formula wt.}}{1}$ b) $\frac{\text{Formula wt.}}{2}$ c) $2 \times \text{formula wt.}$ d) $3 \times \text{formula wt.}$
- 5.85 g of NaCl are dissolved in 90 g of water. The mole fraction of NaCl is:
a) 0.1 b) 0.01 c) 0.2 d) 0.0196
- 2.76 g of silver carbonate on being strongly heated yield a residue weighing
a) 2.16 g b) 2.48 g c) 2.64 g d) 2.32 g
- A solution contains Na_2CO_3 and NaHCO_3 . 10 mL of the solution required 2.5 mL of 0.1 M H_2SO_4 for neutralization using phenolphthalein as indicator. Methyl orange is then added when a further 2.5 mL of 0.2 M H_2SO_4 was required. The amount of Na_2CO_3 in 1 litre of the solution is:
a) 5.3 g and 4.2 g b) 3.3 g and 6.2 g c) 4.2 g and 5.3 g d) 6.2 g and 3.3 g
- The volume occupied by one molecule of water (density 1 g cm^{-3}) is:
a) 18 cm^3 b) 22400 cm^3 c) $6.023 \times 10^{-23} \text{ cm}^3$ d) $3.0 \times 10^{-23} \text{ cm}^3$
- 510 mg of a liquid on vaporization in Victor meyer's apparatus displaces 67.2 cm^3 of air at (STP). The molecular weight of the liquid is:
a) 130 b) 17 c) 170 d) 1700
- What volume of 6 M HCL should be added to 2 M HCL to get 1 L of 3 M HCL?
a) 0.25 L b) 1.00 L c) 0.75 L d) 2.50 L
- The normality of one molar sodium carbonate solution is:
a) 2 b) 1 c) 0.5 d) 1.5
- If H_2SO_4 ionises as $\text{H}_2\text{SO}_4 + 2\text{H}_2\text{O} \rightarrow 2\text{H}_3\text{O}^+ + \text{SO}_4^{2-}$, then total number of ions produced by 0.1 M H_2SO_4 will be
a) 9.03×10^{21} b) 3.01×10^{22} c) 6.02×10^{22} d) 1.8×10^{23}
- W_1 of an element combines with oxygen forming W_2 g of its oxide. The equivalent weight of the element is:
a) $[W_1 / W_2] \times 8$ b) $\left[\frac{W_1}{W_2 - W_1}\right] \times 8$ c) $\left[\frac{W_2 - W_1}{W_1}\right] \times 8$ d) $\left[\frac{W_1}{W_1 - W_2}\right] \times 8$
- A sample of ammonium phosphate $(\text{NH}_4)_3\text{PO}_4$ contains 6.36 moles of hydrogen atoms. The number of moles of oxygen atom in the sample is
(atomic mass of N = 14.04, H = 1, P = 31, O = 16)
a) 0.265 b) 0.795 c) 2.12 d) 4.14
- To neutralise 20 mL of $M/10$ NaOH, the volume of $M/20$ HCl needed is:
a) 10 mL b) 30 mL c) 40 mL d) 20 mL

16. A, E, M and n are the atomic weight, equivalent weight, molecular weight and valence of an element. The correct relation is:
 a) $A = E \times n$ b) $A = M/E$ c) $A = M/n$ d) $M = A \times n$
17. Which one of the following set of units represents the smallest and largest amount of energy respectively?
 a) J and erg b) erg and cal c) Cal and eV d) eV and L-atm
18. The number of atoms present in a 0.635 g of Cu piece will be
 a) 6.023×10^{-23} b) 6.023×10^{23} c) 6.023×10^{22} d) 6.023×10^{21}
19. What volume of hydrogen gas, at 273 K and 1 atm pressure will be consumed in obtaining 21.6 g of elemental boron (atomic mass = 10.8) from the reduction of boron trichloride by hydrogen?
 a) 89.6 L b) 67.2 L c) 44.8 L d) 22.4 L
20. The numerical value of N/n (where N is number of molecules is n moles of gas) is:
 a) 8.314 b) 6.02×10^{23} c) 1.602×10^{-24} d) 1.66×10^{-19}
21. In the relationship molecular formula = empirical formula $\times n$. The ' n ' may have:
 a) Any value
 b) Zero value
 c) Only positive integer value
 d) None of the above
22. 10 g CaCO_3 on heating gives 5.6 g CaO and g CO_2 .
 a) 4.4 b) 5.6 c) 6.5 d) 4.2
23. Which of the following changes with increase in temperature?
 a) Molality
 b) Weight fraction of solute
 c) Fraction of solute present in water
 d) Mole fraction
24. On combustion of 4 g of the methane, 10.46 kJ of heat is liberated. Heat of combustion of methane is
 a) 83.68 kJ b) 10.46 kJ c) 41.84 kJ d) 20.93 kJ
25. A gas is found to have the formula $(\text{CO})_x$. Its VD is 70. The value of x must be:
 a) 7 b) 4 c) 5 d) 6
26. Choose the wrong statement.
 a) 1 mole means 6.023×10^{23} particles
 b) Molar mass is mass of one molecule
 c) Molar mass is mass of one mole of a substance
 d) Molar mass is molecular mass expressed in grams
27. The term standard solution is used for the solutions whose:
 a) Normality is known b) Molarity is known c) Strength is known d) All of these
28. The ratio of mole fraction of a solute and a solvent in a binary solution is:
 a) Ratio of their wt. b) One c) Ratio of their mole d) Zero
29. If in a reaction HNO_3 is reduced to NO, the mass of HNO_3 absorbing one mole of electrons would be
 a) 21.0 g b) 36.5 g c) 18.0 g d) 31.5 g
30. At STP 5.6 litre of a gas weighs 60 g. The vapour density of gas is:
 a) 60 b) 120 c) 30 d) 240
31. The number of atoms present in 16 g of oxygen gas is:
 a) $6.02 \times 10^{11.5}$ b) 3.01×10^{23} c) $3.01 \times 10^{11.5}$ d) 6.02×10^{23}
32. On analysis a certain compound was found to contain iodine and oxygen in the ratio of 254 g of iodine (at. mass 127) and 80 g oxygen (at. mass 16). What is the formula of the compound?
 a) IO b) I_2O c) I_2O_3 d) I_2O_5
33. The vapour density of a volatile chloride of a metal is 95 and the specific heat of the metal is 0.13 cal/g. The equivalent weight of the metal will be:
 a) 6.0 b) 12.3 c) 18.6 d) 24.5

34. The equivalent weight of a certain trivalent element is 20. Molecular weight of its oxide is
 a) 152 b) 56 c) 168 d) 68
35. Gram molecular volume of oxygen at STP is
 a) 3200 cm³ b) 5600 cm³ c) 22400 cm³ d) 11200 cm³
36. Two elements X (at. Wt. 75) and Y (at. wt. 16) combine to give a compound having 75.8% of X. The formula of compound will be
 a) XY b) X₂Y c) XY₃ d) X₂Y₃
37. The amount of oxalic acid (hydrated) required to prepare 500 mL of its 0.1 N solution is:
 a) 0.315 g b) 6.3 g c) 3.15 g d) 63.0 g
38. The equivalent weight of KMnO₄ for acid solution is
 a) 79 b) 52.16 c) 158 d) 31.6
39. Consider a titration of potassium dichromate solution with acidified Mohr's salt solution using diphenylamine as indicator. The number of moles of Mohr's salt required per mole of dichromate is
 a) 3 b) 4 c) 5 d) 6
40. A mixture of CH₄, N₂ and O₂ is enclosed in a vessel of one litre capacity at 0°C. The ratio of particle pressures of gases is 1 : 4 : 2. Total pressure of the gaseous mixture is 2660 mm. the number of molecules of oxygen present in the vessel is
 a) $\frac{6.02 \times 10^{23}}{22.4}$ b) 6.02 × 10²³ c) 22.4 × 10²² d) 1000
41. x g of Ag was dissolved in HNO₃ and the solution was treated with excess of NaCl when 2.87 g of AgCl was precipitated. The value of x is
 a) 1.08 g b) 2.16 g c) 2.70 g d) 1.62 g
42. One mole electron means:
 a) N electrons
 b) 6.023 × 10²³ electrons
 c) 0.55 mg electrons
 d) All of these
43. A signature, written in carbon pencil weights 1 mg. What is the number of carbon atoms present in the signature?
 a) 5.02 × 10²³ b) 5.02 × 10²⁰ c) 6.02 × 10²⁰ d) 0.502 × 10²⁰
44. The minimum quantity of H₂S needed to precipitate 63.5 g of Cu²⁺ will be nearly:
 a) 63.5 g b) 31.75 g c) 34 g d) 20 g
45. An unknown element forms an oxide. What will be the equivalent weight of the element if the oxygen content is 20% by weight?
 a) 16 b) 32 c) 8 d) 64
46. Cortisone is a molecular substance containing 21 atoms of carbon per molecule. The molecular weight of cortisone is 360.4. what is the percentage of carbon in cortisone?
 a) 59.9% b) 75% c) 69.98% d) None of these
47. Which mode of expressing concentration is independent of temperature?
 a) Molality b) Per cent by weight c) Mole fraction d) All of these
48. An ion is reduced to the element when it absorbs 6 × 10²⁰ electrons. The number of equivalent of ion is:
 a) 0.1 b) 0.01 c) 0.001 d) 0.0001
49. The volume of 0.1 M H₂SO₄ required to neutralise 30 mL of 2.0 M NaOH is:
 a) 100 mL b) 300 mL c) 400 mL d) 200 mL
50. The law of definite proportions is not applicable to nitrogen oxide because
 a) Nitrogen atomic weight is not constant b) Nitrogen molecular weight is variable
 c) Nitrogen equivalent weight is variable d) Oxygen atomic weight is variable
51. 1.520 g of hydroxide of a metal on ignition gave 0.995 g of oxide. The equivalent weight of metal is
 a) 1.52 b) 0.995 c) 190 d) 9

52. A hydrocarbon contains 10.5 g carbon and 1 g hydrogen. Its 2.81 g has 1L volume at 1 atm and 127°C, hydrocarbon is
 a) C₆H₇ b) C₇H₈ c) C₅H₆ d) None of the above
53. 1 mole of methyl amine on reaction with nitrous acid gives at NTP
 a) 1.0 L of nitrogen b) 22.4 L of nitrogen c) 11.2 L of nitrogen d) 5.6 L of nitrogen
54. The weight of sulphuric acid needed for dissolving 3 g magnesium carbonate is:
 a) 3.5 g b) 7.0 g c) 1.7 g d) 17.0 g
55. When a metal is burnt, its weight is increased by 24 per cent. The equivalent weight of the metal will be:
 a) 25 b) 24 c) 33.3 d) 76
56. A metal oxide is reduced by heating it in a stream of hydrogen. It is found that after complete reduction, 3.15 g of oxide yielded 1.05 g of metal. From the above data we can say that
 a) The atomic weight of metal is 8 b) The atomic weight of metal is 4
 c) The equivalent weight of metal is 4 d) The equivalent weight of metal is 8
57. The ratio of amounts of H₂S needed to precipitate all the metal ions from 100 mL of 1 M AgNO₃ and 100mL of CuSO₄, will be
 a) 1 : 1 b) 1 : 2 c) 2 : 1 d) None of these
58. The mole fraction of NaCl in a solution containing 1 mole of NaCl in 1000 g of water is :
 a) 0.0177 b) 0.001 c) 0.5 d) 0.244
59. Which is correct for Na₂HPO₃?
 a) It is not an acid salt b) Eq. wt. = $\frac{M}{2}$ c) Ox. no. of P is + 3 d) All of these
60. How many g of NaOH will be needed to prepare 250 mL of 0.1 M solution?
 a) 1 g b) 10 g c) 4 g d) 6 g
61. If the specific heat of a metallic element is 0.214 cal/g, the atomic weight will be closest to:
 a) 66 b) 12 c) 30 d) 65
62. An ore contains 1.34% of the mineral argentite, Ag₂S, by mass. How many gram of this ore would have to be processed in order to obtain 1.00 g of pure solid silver, Ag?
 a) 74.6 g b) 85.7 g c) 107.9 g d) 134.0 g
63. In which of the following numbers all zeros are significant?
 a) 0.500 b) 30.000 c) 0.00030 d) 0.0050
64. Weight of an atom of an element is 6.644×10^{-23} g. What will be the number of g atom of that element in 40 kg?
 a) 10³ b) 10⁶ c) 1.5×10^3 d) None of these
65. In a compound A_xB_y :
 a) Mole of A = mole of B = mole of A_xB_y
 b) Eq. of A = Eq. of B = Eq. of A_xB_y
 c) Y × X mole of A = Y × X mole of B = (X + Y) X mole of A_xB_y
 d) Y × X mole of A = Y × X mole of B
66. One gram of hydrogen is found to combine with 80 g of bromine. One gram of calcium (Valency = 2) combines with 4 g of bromine. The equivalent weight of calcium is
 a) 10 b) 20 c) 40 d) 80
67. A bivalent metal has an equivalent mass of 32. The molecular mass of the metal nitrate is
 a) 182 b) 168 c) 192 d) 188
68. 12 g of Mg (at. wt. = 24) will react completely with an acid to give:
 a) One mole of H₂ b) Half mole of H₂ c) One mole of O₂ d) None of these
69. The atomic weight of a metal (M) is 27 and its equivalent weight is 9, the formula of its chloride will be:
 a) MCl b) MCl₉ c) M₃Cl₄ d) MCl₃
70. 1.60 g of a metal were dissolved in HNO₃ to prepare its nitrate. The nitrate on strong heating gives 2 g oxide. The equivalent weight of metal is:

- a) 16 b) 32 c) 48 d) 12
71. 5.85 g of NaCl dissolved in H₂O and solution is made upto 500 mL. The molarity is:
 a) 0.1 b) 0.2 c) 1.0 d) 0.117
72. Which property of an element is not variable?
 a) Valence b) At. wt. c) Eq. wt. d) None of these
73. The oxide of an element possesses the formula M₂O₃. If the equivalent weight of the metal is 9, then the atomic weight of the metal will be:
 a) 9 b) 18 c) 27 d) 54
74. 0.7 g of Na₂CO₃ · xH₂O were dissolved in water and the volume was made to 100 mL, 20 mL of this solution required 19.8 mL of N/10 HCl for complete neutralisation. The value of x is:
 a) 7 b) 3 c) 2 d) 5
75. The specific heat of an element of atomic weight 32 is likely to be:
 a) 0.25 cal/g b) 0.24 cal/g c) 0.20 cal/g d) 0.15 cal/g
76. Number of atoms in 560 g of Fe (atomic mass 56 g mol⁻¹) is
 a) Twice that of 70 g N b) Half that of 20 g H c) Both are correct d) None of these
77. A 400 mg iron capsule contains 100 mg of ferrous fumarate, (CHCOO)₂Fe. the percentage of iron present in it is approximately
 a) 33% b) 25% c) 14% d) 8%
78. Equal weights of Zn metal and iodine are mixed together and I₂ is completely converted to ZnI₂. What fraction by weight of original Zn remains unreacted? (Zn = 65, I = 127)
 a) 0.34 b) 0.74 c) 0.84 d) Unable to predict
79. An aqueous solution containing 6.5 g of NaCl of 90% purity was subjected to electrolysis. After the complete electrolysis, the solution was evaporated to get solid NaOH. The volume of 1 M acetic acid required to neutralise NaOH obtained above is
 a) 1000 cm³ b) 2000 cm³ c) 100 cm³ d) 200 cm³
80. Which of the following is correct?
 a) Mole fraction of I + mole fraction of II = 1
 (if only two components are present)

$$\frac{\text{Mole fraction of I}}{\text{Mole fraction of II}} = \frac{\text{mole of I}}{\text{mole of II}}$$

 b) Mole fraction of II = $\frac{\text{mole of I}}{\text{mole of II}}$
 (if only two components are present)
 Mole fraction of solute =
 c) $\frac{\text{mole of solute}}{\text{mole of solute} + \text{mole of solvent}}$
 d) All of the above
81. The number of significant figures in Avogadro's number is
 a) Four b) Two c) Three d) Can be any of these
82. A gas has a vapour density 11.2. The volume occupied by 1g of the gas at NTP is
 a) 1 L b) 11.2 L c) 22.4 L d) 4 L
83. A metal nitride, M₃N₂ contains 28% of nitrogen. The atomic mass of metal, M is
 a) 24 b) 54 c) 9 d) 87.62
84. An oxide of iodine (I = 127) contains 25.4 g of iodine for 8 g of oxygen. Its formula could be:
 a) I₂O₃ b) I₂O c) I₂O₅ d) I₂O₇
85. 20 g of an acid furnishes 0.5 moles of H₃O⁺ ions in its aqueous solution. The value of 1 g eq. of the acid will be:
 a) 40 g b) 20 g c) 10 g d) 100 g
86. 10 mL of gaseous hydrocarbon on combustion gives 40 mL of CO₂(g) and 50 mL of H₂O (vap). The hydrocarbon is:
 a) C₄H₅ b) C₈H₁₀ c) C₄H₈ d) C₄H₁₀
87. 10 mL of concentrated H₂SO₄ (18 M) is diluted to one litre. The approximate molecular of the dilute acid is:

- a) 18 M b) 180 M c) 0.18 M d) 1.8 M
88. Which represents per cent by strength?
- a) $\frac{\text{wt. of solute}}{\text{volume of solution}} \times 100$
 b) $\frac{\text{wt. of solute}}{\text{volume of solution}} \times 100$
 c) $\frac{\text{volume of solute}}{\text{volume of solution}} \times 100$
 d) All of the above
89. An alkaloid contains 17.28% of nitrogen and its molecular mass is 162. The number of nitrogen atoms present in one molecule of alkaloid is
- a) 5 b) 4 c) 3 d) 2
90. 6.02×10^{20} molecules of urea are present in 100 mL of its solution. The molarity of urea solution is:
- a) 0.1 b) 0.01 c) 0.02 d) 0.001
91. What volume of H_2 at 273 K and 1 atm will be consumed in obtaining 21.6 g of elemental boron (at. mass 10.8) from the reduction of boron trichloride with H_2 ?
- a) 44.8 L b) 22.4 L c) 89.6 L d) 67.2 L
92. In a metal chloride, the weight of metal and chlorine are in the ratio of 1:2. The equivalent weight of the metal will be:
- a) 71 b) 35.5 c) 106.5 d) 17.75
93. KMnO_4 (mol.wt.= 158) oxidizes oxalic acid in acid medium to CO_2 and water as follows
 $5\text{C}_2\text{O}_4^{2-} + 2\text{MnO}_4^- + 16\text{H}^+ \rightarrow 10\text{CO}_2 + 2\text{Mn}^{2+} + 8\text{H}_2\text{O}$
 What is the equivalent weight of KMnO_4 ?
- a) 158 b) 31.6 c) 39.5 d) 79
94. How many H-atoms are present in 0.046 g of ethanol?
- a) 6×10^{20} b) 1.2×10^{21} c) 3×10^{21} d) 3.6×10^{21}
95. The pair of species having same percentage of carbon is:
- a) CH_3COOH and $\text{C}_6\text{H}_{12}\text{O}_6$
 b) CH_3COOH and $\text{C}_2\text{H}_5\text{OH}$
 c) HCOOCH_3 and $\text{C}_{12}\text{H}_{22}\text{O}_{11}$
 d) $\text{C}_6\text{H}_{12}\text{O}_6$ and $\text{C}_{12}\text{H}_{22}\text{O}_{11}$
96. The maximum number of molecules is present in:
- a) 15 L of H_2 gas at STP b) 5 L of N_2 gas at STP c) 0.5 g of H_2 gas d) 10 g of O_2 gas
97. If one mole of ethanol ($\text{C}_2\text{H}_5\text{OH}$) completely burns to carbon dioxide and water, the weight of carbon dioxide formed is about:
- a) 22 g b) 45 g c) 66 g d) 88 g
98. How many moles of MgIn_2S_4 can be made from 1 g each of Mg, In and S? (Atomic mass : Mg = 24, In = 114.8, S = 32)
- a) 6.47×10^{-4} b) 3.0×10^{-1} c) 9.17×10^{-2} d) 8.7×10^{-3}
99. One g of a mixture of Na_2CO_3 and NaHCO_3 consumes y equivalent of HCl for complete neutralisation. One g of the mixture is strongly heated, then cooled and the residue treated with HCl How many equivalent of HCl would be required for complete neutralization?
- a) 2y equivalent b) y equivalent c) $3y/4$ equivalent d) $3y/2$ equivalent
100. An organic compound containing C and H has 92.3% of carbon, its empirical formula is
- a) CH b) CH_3 c) CH_2 d) CH_4
101. 1.5 g of a divalent metal displaced 4 g of copper (at. wt. = 63.8) from a solution of copper sulphate. The atomic weight of the metal is:
- a) 12 b) 24 c) 48 d) 6
102. 4 g of copper was dissolved in concentrated nitric acid. The copper nitrate solution on strong heating gave 5 g of its oxide. The equivalent weight of copper is

- a) 23 b) 32 c) 12 d) 20

103. If w_1 g of a metal X displaces w_2 g of another metal Y from its salt solution and if the equivalent weights are E_1 and E_2 respectively, the correct expression for the equivalent weight of X is

- a) $E_1 = \frac{w_1}{w_2} \times E_2$ b) $E_1 = \frac{w_2 \times E_2}{w_1}$ c) $E_1 = \frac{w_1 \times w_2}{E_2}$ d) $E_1 = \sqrt{\frac{w_1}{w_2}} \times E_2$

104. The weight of an atom of atomic mass 260 amu is:

- a) 4.32×10^{-22} g b) 4.32×10^{-23} g c) 4.32×10^{-24} g d) 4.32×10^{-21} g

105. An organic compound has an empirical formula (CH_2O) its vapour density is 45. The molecular formula of the compound is

- a) CH_2O b) C_2H_5O c) C_2H_2O d) $C_3H_6O_3$

106. 10 g of hydrogen and 64 of oxygen were filled in a steel vessel and exploded. Amount of water produced in this reaction will be:

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

107. If one mole of H_2SO_4 reacts with an excess of $NaOH$, how many moles of water are formed?

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

108. The mass of 112cm^3 of CH_4 gas at STP is

- a) 0.16 g b) 0.8 g c) 0.08 g d) 1.6 g

109. Which term is to be correctly used for expressing concentration of electrolytes in solution?

- a) Molarity b) Normality c) Formality d) None of these

110. The haemoglobin from the red blood corpuscles of most mammals contains approximately 0.33% of iron by weight. The molecular weight of haemoglobin as 67,200. The number of iron atoms in each molecule of haemoglobin is (atomic weight of iron = 56):

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

111. If two compounds have the same empirical formula but different molecular formulae, they must have

- a) Different percentage composition b) Different molecular weights
c) Same viscosity d) Same vapour density

112. 0.1 mole of a carbohydrate with empirical formula CH_2O contains 1 g of hydrogen. What is its molecular formula?

- a) $C_5H_{10}O_5$ b) $C_6H_{12}O_6$ c) $C_4H_8O_4$ d) $C_3H_6O_3$

113. Mole fraction of the solute in a 1.00 molal aqueous solution is:

- a) 1.7700 b) 0.1770 c) 0.0177 d) 0.0344

114. How many moles of magnesium phosphate, $Mg_3(PO_4)_2$ will contain 0.25 mole of oxygen atoms?

- a) 0.02 b) 3.125×10^{-2} c) 1.25×10^{-2} d) 2.5×10^{-2}

115. 2 g of mixture of CO and CO_2 on reaction with excess I_2O_5 produced 2.54 g of I_2 . What would be the mass % of CO_2 in the original mixture?

- a) 60 b) 30 c) 70 d) 35

116. On analysis a certain compound was found to contain iodine and oxygen in the ration 254 g of iodine and 80 g of oxygen. The atomic mass of iodine is 127 and that of oxygen is 16. Which is the formula of the compound?

- a) IO b) I_2O c) I_5O_2 d) I_2O_5

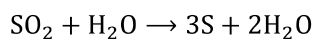
117. The vapour density of gas A is three times that of gas B . If the molecular weight of A is M , the molecular weight of B is:

- a) $3M$ b) $\sqrt{3}M$ c) $M/3$ d) $M/\sqrt{3}$

118. A sample of pure Cu (3.18 g) heated in a stream of oxygen for some time gains in weight with the formation of black oxide of copper (CuO). The final weight is 3.92 g. What per cent of copper remains unoxidised?

- a) ≈ 6.5 b) ≈ 6.9 c) ≈ 7.6 d) ≈ 7.9

119. In the following reaction, which choice has value twice that of the equivalent mass of the oxidizing agent?

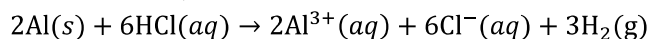


- a) 64 b) 32 c) 16 d) 48

120. The chloride of metal contains 71 % chlorine by weight and the vapour density of it is 50. The atomic weight of the metal will be:
a) 29 b) 58 c) 35.5 d) 71
121. If 0.5 mole of BaCl_2 is mixed with 0.2 mole of Na_3PO_4 , the maximum number of moles of $\text{Ba}_3(\text{PO}_4)_2$ that can be formed is
a) 0.7 b) 0.5 c) 0.03 d) 0.10
122. How many significant figures are there in (respectively) (1) 73.000 g (2) 0.0503 g and (3) 2.001 s?
a) 3,3,4 b) 3,4,5 c) 2,5,4 d) 5,3,4
123. The formula weight of $\text{Al}_2(\text{SO}_4)_3$ is 342. A solution containing 342 g of $\text{Al}_2(\text{SO}_4)_3$ in :
a) One litre of solution is one molar
b) One litre of solution is 2 molar
c) 1000 g of water is 3 normal
d) 2 litre of solution is 3 molar
124. For the reaction, $\text{Na}_2\text{CO}_3 + 2\text{HCl} \rightarrow \text{NaCl} + \text{H}_2\text{O} + \text{CO}_2$ Equivalent weight of Na_2CO_3 is
a) $\frac{M}{2}$ b) M c) $2M$ d) $\frac{M}{4}$
125. Two oxides of a metal contain 50% and 40% metal (M) respectively. If the formula of first oxide is MO_2 , the formula of second oxide will be
a) MO_2 b) MO_3 c) M_2O d) M_2O_3
126. An organic compound on analysis was found to contain 10.06% carbon, 0.84% hydrogen and 89.10% chlorine. What will be the empirical formula of the substance?
a) CH_2Cl_2 b) CHCl_3 c) CCl_4 d) CH_3Cl
127. 22.4 litre of water vapour at NTP, when condensed to water, occupies an approximate volume of:
a) 18 litre b) 1 litre c) 1 mL d) 18 mL
128. Which statement is correct?
a) Atomic weight of an element varies with valence
b) Molecular weight changes with valence
c) Equivalent weight changes with valence
d) None of the above
129. Excess of carbon dioxide is passed through 50 mL of 0.5 M calcium hydroxide solution. After the completion of the reaction, the solution was evaporate was evaporated to dryness. The solid calcium carbonate was completely neutralised with 0.1 N hydrochloric acid. The volume of hydrochloric acid required is (Atomic mass of calcium=40)
a) 300 cm^3 b) 200 cm^3 c) 500 cm^3 d) 400 cm^3
130. 9.8 g of H_2SO_4 is present in 2 litre of a solution. The molarity of the solution is:
a) 0.1 M b) 0.05 M c) 0.01 M d) 0.2 M
131. The number of mole present in 2 litre of 0.5 M NaOH is:
a) 2 b) 1 c) 0.1 d) 0.5
132. The solution A and B are 0.1 and 0.2 molar in a substance. If 100 mL of A are mixed with 25 mL of B and there is no change in volume on mixing, then the final molarity of the solution is:
a) 0.15 M b) 0.18 M c) 0.12 M d) 0.30 M
133. The gravimetric composition of water as H : O is:
a) 1 : 1 b) 1 : 2 c) 1 : 8 d) 1 : 16
134. A mixture of CaCl_2 and NaCl weighing 4.44 g is treated with sodium carbonate solution to precipitate all the Ca^{2+} ions as calcium carbonate. The calcium carbonate so obtained is heated strongly to get 0.56 g of CaO . The percentage of NaCl in the mixture (atomic mass of Ca = 40) is

- a) 75 b) 30.6 c) 25 d) 69.4

135. In the reaction,



- a) 6 L HCl (aq) is consumed for every 3 L H₂(g) produced
 b) 33.6 L H₂(g) is produced regardless of temperature and pressure for every mole Al that reacts
 c) 67.2 L H₂(g) at STP is produced for every mole Al that reacts
 d) 11.2 L H₂(g) at STP is produced for every mole HCl(aq) consumed
136. Number of atoms of oxygen present in 10.6 g of Na₂CO₃ will be
 a) 6.02×10^{23} b) 12.04×10^{22} c) 1.806×10^{23} d) 31.80×10^{28}
137. If 0.22 of a substance when vaporized displaced 45 cm³ of air measured over water at 293 K and 755 mm pressure and if vapour pressure of H₂O = 17.4 mm then the molecular weight of substance will be:
 a) 222.2 b) 332.3 c) 121.1 d) 127.5
138. The number of water molecules present in a drop of water (volume 0.0018 mL) at room temperature is
 a) 6.023×10^{19} b) 1.084×10^{18} c) 4.84×10^{17} d) 6.023×10^{23}
139. A certain amount of a metal whose equivalent mass is 28 displaces 0.7 L of H₂ at STP from an acid. Hence, mass of the element is
 a) 1.75 g b) 0.875 g c) 3.50 g d) 7.00 g
140. Law of multiple proportions is illustrated by one of the following pairs
 a) H₂S and SO₂ b) NH₃ and NO₂ c) Na₂S and Na₂O d) N₂O and NO
141. Amount of oxygen required for combustion of 1 kg of a mixture of butane and isobutane is:
 a) 1.8 kg b) 2.7 kg c) 4.5 kg d) 3.58 kg
142. About a gaseous reaction,
 $xX + yY \rightarrow lL + mM$
 Which statement is wrong?
 a) x litre of X combines with y litre of Y to give L and M b) x moles of X combines with y moles of Y to give L and M
 c) x number of molecules of X combine with y number of molecules of Y to form L and M d) x g of X combines with y g of Y to give M and L
143. The simplest formula of a compound containing 50% of element X (at. wt. 10) and 50% of element Y (at. wt. 20) is:
 a) XY b) X_2Y c) XY_2 d) X_2Y_3
144. The number of mole of KCl in 1000 mL of 3 molar solution is:
 a) 1.5 b) 3.0 c) 1.0 d) 4.0
145. A person has as many as notes as number of oxygen atoms in 24.8 g Na₂S₂O₃ · 5H₂O (mol. wt. = 248.0). A note counting machine counts 60 million notes per day. How much day would be taken to count these notes?
 a) 10^{17} b) 10^{10} c) 10^{15} d) 10^{12}
146. An oxide of sulphur contains 50 % S. what will be its empirical formula?
 a) SO b) SO₂ c) SO₃ d) S₂O₃
147. 8 g of O₂ has the same number of molecules as:
 a) 7 g of CO b) 11 g of CO₂ c) 7 g of N₂ d) All of these
148. When 10 g of 90% pure lime stone is heated completely, the volume (in litres) of CO₂ is liberated at STP is
 a) 22.4 b) 2.24 c) 20.16 d) 2.016
149. Mass of 0.1 mole of methane is
 a) 1 g b) 16 g c) 1.6 g d) 0.1 g
150. The per cent of N in 66% pure (NH₄)₂SO₄ sample is:
 a) 32 b) 28 c) 14 d) None of the above

151. Equal weight of Fe_2O_3 and FeO has weight of oxygen in the ratio:
 a) 1.35 b) 0.74 c) 0.37 d) 2.7
152. The number of mole of solute per kg of solvent is called:
 a) Mole fraction of solute
 b) Normality
 c) Molarity
 d) Molality
153. The empirical formula of a compound is CH_2O . If its VD is 30, its molecular formula is:
 a) CH_2O b) $\text{C}_2\text{H}_4\text{O}_2$ c) $\text{C}_3\text{H}_6\text{O}_3$ d) CH_3OH
154. The decomposition of a certain mass of CaCO_3 gave 11.2 dm^3 of CO_2 gas at STP. The mass of KOH required to completely neutralise the gas is
 a) 56 g b) 28 g c) 42 g d) 20 g
155. 19.7 kg of gold was recovered from a smuggler. How many atoms of gold were recovered ($\text{Au} = 197$)?
 a) 100 b) 6.02×10^{23} c) 6.02×10^{24} d) 6.02×10^{25}
156. 2.79 g of silver carbonate on being strongly heated yields a residue weighing:
 a) 2.16 g b) 2.48 g c) 2.32 g d) 2.64 g
157. In acidic medium, the equivalent weight of $\text{K}_2\text{Cr}_2\text{O}_7$ (Mol. wt. = M) is
 a) M b) $\frac{M}{2}$ c) $\frac{M}{3}$ d) $\frac{M}{6}$
158. Which has the highest mass?
 a) 1 g-atom of C
 b) $1/2$ mole of CH_4
 c) 10 mL of water
 d) 3.011×10^{23} atoms of oxygen
159. How many atoms are present in a mole of $\text{CH}_3\text{COOC}_2\text{H}_5$?
 a) $14 \times 6.02 \times 10^{23}$ atom/mol
 b) $10 \times 6.02 \times 10^{23}$ atom/mol
 c) $7 \times 6.02 \times 10^{23}$ atom/mol
 d) None of the above
160. Volume of 2 M HCl needed to neutralize the solution containing one litre of 1 M solution of NaOH is :
 a) 1 litre b) 2 litre c) 3 litre d) $\frac{1}{2}$ litre
161. 80 g of oxygen contains as many atoms as in
 a) 80 g of hydrogen b) 1 g of hydrogen c) 10 g of hydrogen d) 5 g of hydrogen
162. An element A (at. wt. = 75) and B (at. wt. = 25) combine to form a compound. The compound contains 75% A by weight. The formula of the compound will be:
 a) A_2B b) A_3B c) AB_3 d) AB
163. If molecular weight of KMnO_4 is M , then its equivalent weight in acidic medium would be
 a) M b) $\frac{M}{2}$ c) $\frac{M}{5}$ d) $\frac{M}{3}$
164. Molecular weight of tribasic acid is W . Its equivalent weight will be:
 a) $W/2$ b) $W/3$ c) W d) $3W$
165. 5 mL of N HCl , 20 mL of $N/2$ H_2SO_4 and 30 mL of $N/3$ HNO_3 are mixed together and volume made one litre. The normality of the resulting solution is:
 a) $N/5$ b) $N/10$ c) $N/20$ d) $N/40$
166. If 20 g of CaCO_3 is treated with 100 mL of 20% HCl solution, the amount of CO_2 produced is
 a) 22.4 L b) 8.80 g c) 4.40 g d) 2.24 L

167. The empirical formula of a compound is CH_2 . One mole of this compound has a mass of 42 g. Its molecular formula is
 a) C_3H_6 b) C_3H_8 c) CH_2 d) C_2H_2
168. The volume of air needed for complete combustion of 1 kg carbon at STP is:
 a) 9333.33 litre b) 933.33 litre c) 93.33 litre d) 1866.67 litre
169. Mixture $X = 0.02$ mole of $[\text{Co}(\text{NH}_3)_5\text{SO}_4]\text{Br}$ and 0.02 mole of $[\text{Co}(\text{NH}_3)_5\text{Br}]\text{SO}_4$ was prepared in 2 L of solution.
 1 L of mixture $X + \text{excess AgNO}_3 \rightarrow Y$
 1 L of mixture $X + \text{excess BaCl}_2 \rightarrow Z$
 Number of moles of Y and Z are
 a) 0.01, 0.01 b) 0.02, 0.01 c) 0.01, 0.02 d) 0.02, 0.02
170. 100 mL each of $0.5 N$ NaOH , $N/5$ HCl and $N/10$ H_2SO_4 are mixed together. The resulting solution will be:
 a) Acidic b) Neutral c) Alkaline d) None of these
171. 1.5 litre of a solution of normality N and 2.5 litres of $2 M$ HCl are mixed together. The resultant solution had a normality 5. The value of N is:
 a) 6 b) 10 c) 8 d) 4
172. The number of water molecules in 1 L of water is
 a) 18 b) 18×1000 c) N_A d) $55.55 N_A$
173. The maximum number of molecules are present in
 a) 15 L of H_2 gas at STP b) 5 L of N_2 gas at STP
 c) 0.5 g of H_2 gas d) 10 g of O_2 gas
174. Polyethylene can be produced from calcium carbide according to the following sequence of reactions;
 $\text{CaC}_2 + \text{H}_2\text{O} \rightarrow \text{CaO} + \text{HC} \equiv \text{CH}$
 $n\text{HC} \equiv \text{CH} + n\text{H}_2 \longrightarrow \left[\text{CH}_2 - \text{CH}_2 \right]_n$
- The mass of polyethylene which can be produced from 20.0 kg of CaC_2 is:
 a) 6.75 kg b) 7.75 kg c) 8.75 kg d) 9.75 kg
175. Calculate g-atom of element in 40 kg, if weight of one atom of an element is 6.644×10^{-23} g:
 a) 10^2 g-atom b) 10 g-atom c) 10^3 g-atom d) None of these
176. The molality of 15% (wt./vol.) solution of H_2SO_4 of density 1.1 g/cm^3 is approximately:
 a) 1.2 b) 1.4 c) 1.8 d) 1.6
177. The density of NH_4OH solution is 0.6 g/mL . It contains 34% by weight of NH_4OH . Calculate the normality of the solution:
 a) $4.8 N$ b) $10 N$ c) $0.5 N$ d) $5.8 N$
178. 171 g of cane sugar (mol. wt. = 342) are dissolved in 1000 g of water at 30°C . If the density of solution is 1.1 g/mL , then:
 a) Molarity < molality b) Molarity = molality c) Molality < molarity d) None of these
179. Amount of oxygen required for complete combustion of 27 g Al is:
 a) 24 g b) 12 g c) 20 g d) 6 g
180. The least number of molecules are contained in:
 a) 2 g hydrogen b) 8 g oxygen c) 4 g nitrogen d) 16 g CO_2
181. Which of the following is correct for
 $\text{C}(\text{graphite}) + \text{O}_2(\text{gas}) \rightarrow \text{CO}_2$, heat = -348 kJ ?
 a) Heat absorbed b) Mass of product > Mass of reactant
 c) Mass of product < Mass of reactant d) Mass of product = Mass of reactant
182. The molarity of $2 N$ H_2SO_4 is:
 a) $1 M$ b) $2 M$ c) $3 M$ d) $4 M$
183. Amount of oxalic acid present in a solution can be determined by its titration with KMnO_4 solution in the presence of H_2SO_4 . The titration given unsatisfactory result when carried out in the presence of HCl

- because HCl
- Gets oxidised by oxalic acid to chlorine
 - Furnishes H^+ ions in addition to those from oxalic acid
 - reduces permanganate to Mn^{2+}
 - Oxidises oxalic acid to carbon dioxide and water
184. The mass of 112 cm^3 of CH_4 gas at STP is
- 0.16 g
 - 0.8 g
 - 0.08 g
 - 1.6 g
185. The volume of oxygen necessary for the complete combustion of 20 L of propane is
- 40 L
 - 60 L
 - 80 L
 - 100 L
186. The value of gram molar volume of gas is:
- 1 litre
 - 22.4 litre
 - 11.2 litre
 - 22.4 litre at STP
187. Carbon dioxide contains 27.27% of carbon, carbon disulphide contains 15.79% of carbon and sulphur dioxide contains 50% of sulphur. This data is in agreement with
- Law of conservation of mass
 - Law of definite proportions
 - Law of multiple proportions
 - Law of reciprocal proportions
188. In a compound C, H, N atoms are present in 9 : 1 : 3.5 by weight. Molecular weight of compound is 108, its molecular formula is:
- $C_2H_6N_2$
 - C_3H_4N
 - $C_6H_8N_2$
 - $C_9H_{12}N_3$
189. The total molarity of all the ions containing 0.1 M of $CuSO_4$ and 0.1 M of $Al_2(SO_4)_3$ is:
- 0.2 M
 - 0.7 M
 - 0.8 M
 - 1.2 M
190. How much water is to be added to dilute 10 mL of 10 N HCl to make it decinormal?
- 990 mL
 - 1010 mL
 - 100 mL
 - 1000 mL
191. Density of air at NTP is 0.001293 g/mL. Its vapour density is:
- 0.001293
 - 1.293
 - 14.48
 - Cannot be calculated
192. The number of moles of water present in 90 g of water is:
- 2
 - 3
 - 4
 - 5
193. If 30 mL of H_2 and 20 mL of O_2 reacts to form water, what is left at the end of reaction:
- 10 mL H_2
 - 5 mL H_2
 - 10 mL O_2
 - 5 mL O_2
194. The term atom molecule were introduced by:
- Ostwald, Avogadro respectively
 - Dalton, Avogadro respectively
 - Avogadro, Dalton respectively
 - None of the above
195. Arrange the following in the order of increasing mass (atomic mass; O = 16, Cu = 63, N = 14)
- One atom of oxygen
 - One atom of nitrogen
 - 1×10^{-10} mole of oxygen
 - 1×10^{-10} mole of copper
- $II < I < III < IV$
 - $I < II < III < IV$
 - $III < II < IV < I$
 - $IV < II < III < I$
196. One part of an element A combines with two parts of another element B. 6 parts of element C combines with 4 parts of B. If A and C combine together, the ratio of their weights, will be governed by
- Law of definite proportions
 - Law of multiple proportions
 - Law of reciprocal proportions
 - Law of conservation of mass
197. A metal oxide has the formula Z_2O_3 . It can be reduced by hydrogen to give free metal and water. 0.1596 g of the metal oxide required 6 mg of hydrogen for complete reduction. The atomic weight of the metal is:
- 27.90
 - 159.60
 - 79.80
 - 55.80
198. x grams of calcium carbonate was completely burnt in air. The weight of the solid residue formed is 28 g. What is the value of x (in grams)?
- 44
 - 200
 - 150
 - 50
199. In a gaseous reaction of the type $aA + bB \rightarrow cC + dD$, which is wrong?

- a) a litre of *A* combines with *b* litre of *B* to give *C* and *D*
 b) a mole of *A* combines with *b* mole of *B* to give *C* and *D*
 c) *a* g of *A* combines with *b* g of *B* to give *C* and *D*
 d) *a* molecules of *A* combines with *b* molecules of *B* to give *C* and *D*
200. Which of the following are correct?
 a) *G* molecular wt. = mol. wt. in g = wt. of *N* molecules
 b) 1 mole = *N* molecules = 6.023×10^{23} molecule
 c) Mole = g molecules
 d) All of the above
201. Cyclohexanol is dehydrated to cyclohexene on heating with conc H_2SO_4 . The cyclohexene obtained from 100 g cyclohexanol will be (If yield of reaction is 75%)
 a) 61.5 g b) 75.0 g c) 20.0 g d) 41.0 g
202. A compound was found to contain nitrogen and oxygen in the ratio, nitrogen 28 g and 80 g of oxygen. The formula of the compound is:
 a) NO b) N_2O_3 c) N_2O_5 d) N_2O_4
203. Versene, a chelating agent having chemical formula $C_2H_4N_2(C_2H_2O_2Na)_4$. If each mole of this compound could bind 1 mole of Ca^{2+} , then the rating of pure versene expressed as mg of $CaCO_3$ bound per g of chelating agent is:
 a) 100 mg b) 163 mg c) 200 mg d) 263 mg
204. Which of the following is correct?
 a) $Meq. = N \times V_{in\ mL} = \frac{wt.}{Eq.wt.} \times 1000$
 b) $Eq. = N \times V_{in\ mL} = \frac{wt.}{Eq.wt.}$
 c) Equal equivalent or milli equivalent of reactants react to give same eq. or Meq. of products
 d) All of the above
205. 1.0 g of pure calcium carbonate was found to require 50 mL of dilute HCl for complete reactions. The strength of the HCl solution is given by:
 a) 4 *N* b) 2 *N* c) 0.4 *N* d) 0.2 *N*
206. The number of atoms in 4.25 g of NH_3 is approximately
 a) 6×10^{23} b) 2×10^{23} c) 1.5×10^{23} d) 1×10^{23}
207. MnO_4^- ions are reduced in acidic condition to Mn^{2+} ions whereas they are reduced in neutral condition to MnO_2 . The oxidation of 25 mL of a solution *X* containing Fe^{2+} ions required in acidic condition 20 mL of a solution *Y* containing MnO_4^- ions. What volume of solution *Y* would be required to oxidise 25 mL of a solution *X* containing Fe^{2+} ions in neutral condition?
 a) 11.4 mL b) 12.0 mL c) 33.3 mL d) 35.0 mL
208. Number of atoms of He in 100 u of He (atomic weight of He is 4) are
 a) 25 b) 100 c) 50 d) $100 \times 6 \times 10^{-23}$
209. Total number of atoms present in 1.0 cm^3 of solid glucose (density 0.8 g/ cm^3) at 25°C are:
 a) 2.68×10^{21} b) 6.42×10^{22} c) 2.68×10^{22} d) 2.68×10^{23}
210. For preparing *M*/ 10 solution of H_2SO_4 in one litre we need H_2SO_4 :
 a) 9.8 g b) 49.0 g c) 4.8 g d) 0.09 g
211. Given, that the abundances of isotopes ^{54}Fe , ^{56}Fe and ^{57}Fe are 5%, 90% and 5%, respectively, the atomic mass of Fe is
 a) 55.85 b) 55.95 c) 55.75 d) 56.05
212. The concentration of solution containing 0.5 mole H_3PO_4 dissolved in 500 g water:
 a) 1 *m* b) 1 *M* c) 1 *N* d) 0.5 *M*
213. Which of the following is correct?

- a) Mole = molarity $\times V_{\text{in L}} = \frac{\text{wt.}}{\text{mol. wt.}}$
 b) Milli mole = molarity $\times V_{\text{in mL}} = \frac{\text{wt.}}{\text{mol. wt.}} \times 1000$
 c) Mole and milli mole of reactants react according to stoichiometric ratio of balanced chemical equation
 d) All of the above
214. 100 g of CaCO_3 is treated with 1 L of 1 N HCl. What would be the weight of CO_2 liberated after the completion of the reaction?
 a) 55 g b) 11 g c) 22 g d) 33 g
215. If an iodized salt contains 1% KI and a person takes 2 g of the salt every day, the iodide ions going into his body every day would be approximately
 a) 7.2×10^{21} b) 7.2×10^{19} c) 3.6×10^{21} d) 9.5×10^{19}
216. The mass of 11.2 L of ammonia gas at STP is
 a) 8.5 g b) 85 g c) 17 g d) 1.7 g
217. 0.52 g of dibasic acid required 100 mL of 0.1 N NaOH for complete neutralization. The equivalent weight of acid is:
 a) 26 b) 52 c) 104 d) 156
218. 100 tons of Fe_2O_3 containing 20% impurities will give iron by reduction with H_2 equal to
 a) 112 tons b) 80 tons c) 160 tons d) 56 tons
219. 25 mL of a solution of barium hydroxide on titration with 0.1 M solution of HCl gave a titre value of 35 mL. The molarity of $\text{Ba}(\text{OH})_2$ is:
 a) 0.28 b) 0.35 c) 0.07 d) 0.14
220. Volume occupied by one molecule of water (density = 1 g cm^{-3}) is:
 a) $6.023 \times 10^{-23} \text{ cm}^3$ b) $3.0 \times 10^{-23} \text{ cm}^3$ c) $5.5 \times 10^{-23} \text{ cm}^3$ d) $9.0 \times 10^{-23} \text{ cm}^3$
221. The mass of nitrogen per gram hydrogen in the compound hydrazine is exactly one and half times the mass of nitrogen in the compound ammonia. The fact illustrates the
 a) Law of conservation of mass b) Multiple valency of nitrogen
 c) Law of multiple proportions d) Law of definite proportions
222. Strength of the solution is given by:
 a) $S = N \times E$
 b) $S = \frac{\text{wt. of solute}}{\text{volume of solution in litre}}$
 c) $S = M \times \text{mol. wt.}$
 d) All of the above
223. 0.5 mole of H_2SO_4 is mixed with 0.2 mole of $\text{Ca}(\text{OH})_2$. The maximum number of mole of CaSO_4 formed is:
 a) 0.2 b) 0.5 c) 0.4 d) 1.5
224. On dissolving 1 mole each of the following acids in 1 litre water, the acid which do not give a solution of 1 N strength is:
 a) HCl b) HClO_4 c) HNO_3 d) H_3PO_4
225. The empirical formula of a compound is CH. Its molecular weight is 78. The molecular formula of the compound will be:
 a) C_2H_2 b) C_3H_3 c) C_2H_4 d) C_2H_6
226. Of two oxides of iron, the first contained 22% and the second contained 30% of oxygen by weight. The ratio of weights of iron in the two oxides that combine with the same weight of oxygen, is
 a) 3 : 2 b) 2 : 1 c) 1 : 2 d) 1 : 1
227. The total number of protons in 10 g of calcium carbonate is ($N_0 = 6.023 \times 10^{23}$)
 a) 3.01×10^{24} b) 4.06×10^{24} c) 2.01×10^{24} d) 3.02×10^{24}
228. In the following reaction,
 $\text{MnO}_2 + 4\text{HCl} \rightarrow \text{MnCl}_2 + 2\text{H}_2\text{O} + \text{Cl}_2$
 2 mol MnO_2 reacts with 4 mol of HCl to form 11.2 L Cl_2 at STP. Thus, per cent yield of Cl_2 is

- a) 25% b) 50% c) 100% d) 75%
229. The normality of 1% (wt./vol.) H_2SO_4 is nearly:
 a) 0.02 b) 0.2 c) 0.1 d) 1
230. The mass of 1 mole of electrons is
 a) 9.1×10^{-28} g b) 1.008 mg c) 0.55 mg d) 9.1×10^{-27} g
231. 74.4 g of a metallic chloride contains 35.5 g of chlorine. The equivalent weight of the metal is:
 a) 19.5 b) 35.5 c) 39.0 d) 78.0
232. Equivalent weight of an acid
 a) Depends on the reaction involved
 b) Depends upon the number of oxygen atoms present
 c) Is always constant
 d) None of the above
233. Which of the following is not a mixture?
 a) Gasoline b) Distilled alcohol c) LPG d) Iodized table salt
234. The equivalent weight of a divalent metal is 31.82. The weight of single atom is:
 a) $32.77 \times 6.02 \times 10^{23}$ b) $63.64 \times 6.02 \times 10^{23}$ c) 63.64 d) $63.64/6.02 \times 10^{23}$
235. Number of mole of 1 m^3 gas at NTP are:
 a) 44.6 b) 40.6 c) 42.6 d) 48.6
236. The per cent loss in weight after heating a pure sample of potassium chlorate (mol. wt. = 122.5) will be:
 a) 12.25 b) 24.50 c) 39.18 d) 49.0
237. The number of milli equivalent contained in 0.5 litre of 0.2 N solution is:
 a) 0.1 b) 100 c) 0.01 d) 1.0
238. Out of 1.0 g dioxygen, 1.0 g (atomic) oxygen and 1.0 g ozone, the maximum number of molecules are contained in
 a) 1.0 g of atomic oxygen b) 1.0 g of ozone
 c) 1.0 g of oxygen gas d) All contain same number of atoms
239. A sample of AlF_3 contains 3.0×10^{24} F ions. The number of formula units of this sample are
 a) 9.0×10^{24} b) 3.0×10^{24} c) 0.75×10^{24} d) 1.0×10^{24}
240. One mole of CO_2 contains
 a) 3 g atoms of CO_2 b) 18.1×10^{23} molecules of CO_2
 c) 6.02×10^{23} atoms of O d) 6.02×10^{23} atoms of C
241. For the reaction, $A + 2B \rightarrow C$, 5 moles of A and 8 moles of B will produce:
 a) 5 moles of C b) 4 moles of C c) 8 moles of C d) 13 moles of C
242. Which sample contains the largest number of atoms?
 a) 1 mg of C_4H_{10} b) 1 mg of N_2 c) 1 mg of Na d) 1 mL of water
243. An aromatic hydrocarbon with empirical formula C_5H_4 on treatment with concentrated H_2SO_4 gave a monosulphonic acid. 0.104 g of the acid required 10 mL of $\frac{\text{N}}{20}$ NaOH for complete neutralisation. The molecular formula of hydrocarbon is
 a) C_5H_4 b) C_{10}H_8 c) $\text{C}_{15}\text{H}_{12}$ d) $\text{C}_{20}\text{H}_{16}$
244. If isotopic distribution of C-12 and C-14 is 98% and 2% respectively then the number of C-14 atoms in 12 g of carbon is
 a) 1.032×10^{22} b) 3.01×10^{22} c) 5.88×10^{23} d) 6.023×10^{23}
245. Zinc sulphate contains 22.65% of zinc and 43.9% of water of crystallization. If the law of constant proportions is true then the weight of zinc required to produce 20 g of the crystals will be
 a) 45.3 g b) 4.53 g c) 0.453 g d) 453 g
246. The number of gram molecules of chlorine in 6.02×10^{25} hydrogen chloride molecules is
 a) 10 b) 100 c) 50 d) 5
247. The net charge on ferrous ion is:
 a) +2 b) +3 c) +4 d) +5

248. H_2O_2 solution used for hair bleaching is sold as a solution of approximately 5.0 g H_2O_2 Per 100 mL of the solution. The molecular weight of H_2O_2 is 34. The molarity of this solution is approximately:
 a) 3.0 b) 1.5 c) 0.15 d) 4.0
249. 4.6×10^{22} atoms of an element weigh 13.8 g. The atomic weight of element is
 a) 290 b) 180 c) 34.4 d) 10.4
250. The weight of 50% (wt./wt.) solution of HCl required to react with 100 g of CaCO_3 would be:
 a) 73 g b) 100 g c) 146 g d) 200 g
251. An element, X has the following isotopic composition
 ^{200}X : 90%
 ^{199}X : 8.0%
 ^{202}X : 2.0%
 The weighted average atomic mass of the naturally occurring element X is closed to
 a) 200 u b) 210 u c) 202 u d) 199 u
252. Law of constant composition is same as the law of
 a) Conservation of mass b) Conservation of energy
 c) Multiple proportion d) Definite proportion
253. One atom of an element X weight 6.643×10^{-23} g. number of moles of atom in 20 kg is
 a) 140 b) 150 c) 250 d) 500
254. The reaction, $2\text{C} + 2\text{O}_2 \rightarrow 2\text{CO}_2$ is carried out by taking 24 g carbon and 96 g O_2 . Which one is limiting reagent?
 a) C b) O_2 c) CO_2 d) None of these
255. 1000 g aqueous solution of CaCO_3 contains 10 g of calcium carbonate. Concentration of solution is:
 a) 10 ppm b) 100 ppm c) 1000 ppm d) 10000 ppm
256. The maximum amount of BaSO_4 precipitated on mixing 20 mL of 0.5 M BaCl_2 with 20 mL of 1 M H_2SO_4 is:
 a) 0.25 mole b) 0.5 mole c) 1 mole d) 0.01 mole
257. The percentage of an element M is 53 in its oxide of molecular formula M_2O_3 . Its atomic mass is about
 a) 45 b) 9 c) 18 d) 27
258. H_3BO_3 is:
 a) Monobasic and weak Lewis acid
 b) Monobasic and weak Bronsted acid
 c) Monobasic and strong Lewis acid
 d) Tribasic and weak Bronsted acid
259. A sample of peanut oil weighing 1.5763 g is added to 25 mL of 0.4210 M KOH after saponification is complete 8.46 mL of 0.2732 M H_2SO_4 is needed to neutralise excess KOH. The saponification number of peanut oil is:
 a) 209.6 b) 108.9 c) 98.9 d) 218.9
260. What quantity of ammonium sulphate is necessary for the production of NH_3 gas sufficient to neutralize a solution containing 292 g of HCl? [$\text{HCl} = 36.5$, $(\text{NH}_4)_2\text{SO}_4 = 132$, $\text{NH}_3 = 17$]
 a) 272 g b) 403 g c) 528 g d) 1056 g
261. A partially dried clay mineral contains 8% water. The original sample contained 12% water and 45% silica. The % of silica in the partially dried sample is nearly:
 a) 50% b) 49% c) 55% d) 47%
262. Number of g-atoms of an element in one atom are:
 a) 6.023×10^{23} b) 1.66×10^{-24} c) 2×10^{23} d) None of these
263. Concentration of HCl is 10 N. 100 mL of 1 N HCl can be obtained by diluting:
 a) 10 mL of conc. HCl to 100 mL
 b) 20 mL of conc. HCl to 100 mL
 c) 100 mL of conc. HCl to 200 mL
 d) 100 mL of conc. HCl to 100 mL
264. The number of formula units of calcium fluoride, CaF_2 present in 146.4 g of CaF_2 (the molar mass of

- CaF₂ is 78.08 g/mol) is
 a) 1.129×10^{24} CaF₂ b) 1.146×10^{24} CaF₂ c) 7.808×10^{24} CaF₂ d) 1.877×10^{24} CaF₂
265. What is the weight of oxygen that is required for the complete combustion of 2.8 kg of ethylene?
 a) 9.6 kg b) 96.0 kg c) 6.4 kg d) 2.8 kg
266. The number of sodium atoms in 2 moles of sodium ferrocyanide is
 a) 12×10^{23} b) 26×10^{23} c) 34×10^{23} d) 48×10^{23}
267. Stoichiometric ratio of sodium dihydrogen orthophosphate and sodium hydrogen orthophosphate required for synthesis of Na₅P₃O₁₁ is
 a) 1.5 : 3 b) 3 : 1.5 c) 1 : 1 d) 2 : 3
268. 4.4 g of CO₂ and 2.24 litre of H₂ at STP are mixed in a container. The total number of molecules present in the container will be:
 a) 6.022×10^{23} b) 1.2044×10^{23} c) 2 mole d) 6.023×10^{24}
269. Calculate the number of moles left after removing 10^{21} molecules from 200 mg of CO₂.
 a) 0.00454 b) 0.00166 c) 2.88×10^{-3} d) None of these
270. Which has maximum number of atoms?
 a) 24 g of C (12) b) 56 g of Fe (56) c) 27 g of Al (27) d) 108 g of Ag (108)
271. A sample of copper sulphate pentahydrate contains 8.64 g of oxygen. How many gram of Cu is present in this sample?
 (Atomic mass of Cu = 63.6, S = 32.06, O = 16)
 a) 0.952 g b) 3.816 g c) 3.782 g d) 8.64 g
272. To neutralise completely 20 ML of 0.1 M aqueous solution of phosphorous acid (H₃PO₃), the volume of 0.1 M aqueous KOH solution required is :
 a) 60 mL b) 20 mL c) 40 mL d) 10 mL
273. 2 g of O₂ at 0°C and 760 mm of Hg pressure has volume
 a) 1.4 L b) 2.8 L c) 11.2 L d) 22.4 L
274. An organic compound contains 20.0% C, 6.66% H, 47.33% N and the rest was oxygen. Its molar mass is 60 g mol⁻¹ the molecular formula of the compound is
 a) CH₄N₂O b) C₂H₄NO₂ c) CH₃N₂O d) CH₄N₂O₂
275. One mole of solute (NaCl) is dissolved in 1 litre water. The molarity of solution is:
 a) > 1 M b) < 1 M c) = 1 M d) = 2 M
276. 100 mL of 0.1 N hypo decolourised iodine by the addition of x gram of crystalline copper sulphate to excess of KI. The value of 'x' is
 (molecular wt. of CuSO₄, 5H₂O is 250)
 a) 5.0 g b) 1.25 g c) 2.5 g d) 4 g
277. Which of the following contains greatest number of oxygen atoms?
 a) 1 g of O b) 1 g of O₂
 c) 1 g of O₃ d) All have the same number of atoms
278. The normality of 4% (wt./vol.) NaOH is:
 a) 0.1 b) 1.0 c) 0.05 d) 0.01
279. The mass of potassium dichromate crystals required to oxidise 750 cm³ of 0.6 M Mohr's salt solution is
 (Given, molar mass : Potassium dichromate = 294, Mohr's salt = 392)
 a) 0.49 g b) 0.45 g c) 22.05 g d) 2.2 g
280. If 0.5 mole of BaCl₂ is mixed with 0.2 mole of Na₃PO₄ the maximum number of mole of Ba₃(PO₄)₂ that can be formed is:
 a) 0.7 b) 0.5 c) 0.30 d) 0.1
281. Which has the maximum number of atoms?
 a) 6 g C b) 1 g H₂ c) 12 g Mg d) 30 g Ca
282. Mixing up of equal volumes of 0.1 M NaOH and 0.1 M CH₃COOH yields a solution which is:
 a) Basic b) Acidic c) Neutral d) None of these

283. If 6.3 g of NaHCO_3 are added to 15.0 g CH_3COOH solution, the residue is found to weight 18.0 g. what is the mass of CO_2 released in the reaction?
 a) 4.5 g b) 3.3 g c) 2.6 g d) 2.8 g
284. 50 mL of an aqueous solution of glucose contains 6.02×10^{22} molecules. The concentration of solution is:
 a) 0.1 M b) 1.0 M c) 0.2 M d) 2.0 M
285. Molar concentration of a solution in water is:
 a) Always equal to normality of solution
 b) More than molality of the solution
 c) Equal to molality of the solution
 d) Less than the molality of the solution
286. 1 kg of NaOH solution contains 4 g of NaOH. The approximate concentration of the solution is:
 a) 1 molar b) 0.1 molar c) Decinormal d) About 0.1 N
287. How many moles of lead (II) chloride will be formed from a reaction between 6.5 g of PbO and 3.2 g of HCl?
 a) 0.333 b) 0.011 c) 0.029 d) 0.044
288. The nature of mixture obtained mixing 50 mL of 0.1 M H_2SO_4 and 50 mL of 0.1 M NaOH is:
 a) Acidic b) Basic c) Neutral d) amphoteric
289. Number of electrons in 1.8 mL of H_2O is :
 a) 6.02×10^{23} b) 3.011×10^{23} c) 0.6022×10^{23} d) 60.22×10^{23}
290. If a compound contains two oxygen atoms, four carbon atoms and number of hydrogen atom is double of carbon atoms, the vapour density of it is:
 a) 88 b) 44 c) 132 d) 72
291. Molecular weight of oxalic acid is 126. The weight of oxalic acid required to neutralise 1000 mL of normal solution of NaOH is:
 a) 126 g b) 63 g c) 6.3 g d) 12.6 g
292. The number of hydrogen atoms present in 25.6 g of sucrose($\text{C}_{12}\text{H}_{22}\text{O}_{11}$) which has a molar mass of 342.3 g is
 a) 22×10^{23} b) 9.91×10^{23} c) 11×10^{23} d) 44×10^{23} H atoms
293. Molarity of liquid HCl with density equal to 1.17 g/mL is:
 a) 36.5 b) 18.25 c) 32.05 d) 4.65
294. If 20 mL of 0.4 N NaOH solution completely neutralizes 40 mL of a dibasic acid, the molarity of the acid solution is:
 a) 0.1 M b) 0.2 M c) 0.3 M d) 0.4 M
295. Dissolving 120 g of urea (mol.wt.60) in 1000 g of water gave a solution of density 1.15 g/mL. The molarity of the solution is:
 a) 1.78 M b) 2.00 M c) 2.05 M d) 2.22 M
296. Equivalent weight of NH_3 as a base is:
 a) 17 b) 17/3 c) 1.7 d) 17/2
297. KMnO_4 reacts with oxalic acid according to the equation
 $2\text{MnO}_4^- + 5\text{C}_2\text{O}_4^{2-} + 16\text{H}^+ \rightarrow 2\text{Mn}^{2+} + 10\text{CO}_2 + 8\text{H}_2\text{O}$ Here, 20 mL of 0.1 M KMnO_4 is equivalent to
 a) 20 mL of 0.5 M $\text{H}_2\text{C}_2\text{O}_4$ b) 50 mL of 0.1 M $\text{H}_2\text{C}_2\text{O}_4$
 c) 50 mL of 0.1 M $\text{H}_2\text{C}_2\text{O}_4$ d) 20 mL of 0.1 M $\text{H}_2\text{C}_2\text{O}_4$
298. To prepare a standard solution of a substance, we use:
 a) A pipette b) A burette c) Measuring flask d) Measuring cylinder
299. There are two isotopes of an element with atomic massz. Heavier one has atomic mass z + 2 and lighter one has z-1, the abundance of lighter one is
 a) 66.6% b) 69.7% c) 6.67% d) 33.3%
300. 3 g of an oxide of a metal is converted to chloride completely and it yielded 5 g of chloride. The equivalent

- weight of the metal is
 a) 33.25 b) 3.325 c) 12 d) 20
301. The molarity of 20.0 mass % H_2SO_4 solution of density 11.14 g cm^{-3} is
 a) 2.56 mol dm^{-3} b) 1.56 mol dm^{-3} c) 1.26 mol dm^{-3} d) 2.32 mol dm^{-3}
302. How many moles of Fe^{2+} ions are formed, when excess of iron is treated with 50 mL of 4.0 M HCl under inert atmosphere? Assume no change in volume:
 a) 0.4 b) 0.1 c) 0.2 d) 0.8
303. 100 mL of 0.3 N HCl solution were mixed with 200 mL of 0.6 N H_2SO_4 solution. The final acidic normality is:
 a) 0.9 N b) 0.6 N c) 0.5 N d) 0.4 N
304. 45 g of acid of mol. wt. 90 neutralized by 200 mL of 5 N caustic potash. The basicity of the acid is:
 a) 1 b) 2 c) 3 d) 4
305. The equivalent weight of KIO_3 in the reaction,
 $2\text{Cr}(\text{OH})_3 + \text{OH}^- + \text{KIO}_3 \rightarrow 2\text{CrO}_4^{2-} + 5\text{H}_2\text{O} + \text{KI}$ is
 a) Mol. wt. b) Mol. wt./3 c) Mol. wt./6 d) Mol. wt./2
306. The sample with largest number of atoms is
 a) 1 g of $\text{O}_2(\text{g})$ b) 1 g of Ni(s) c) 1 g of B(s) d) 1 g of $\text{N}_2(\text{g})$
307. The equation,
 $2\text{Al}(\text{s}) + (3/2)\text{O}_2(\text{g}) \rightarrow \text{Al}_2\text{O}_3(\text{s})$ shows that:
 a) 2 mole of Al reacts with (3/2) mole of O_2 to produce (7/2) mole of Al_2O_3
 b) 2 g of Al reacts with (3/2) g of O_2 to produce one mole of Al_2O_3
 c) 2 g of Al reacts with (3/2) litre of O_2 to produce 1 mole of Al_2O_3
 d) 2 mole of Al reacts with (3/2) mole of O_2 to produce 1 mole of Al_2O_3
308. The number of atoms in 3.2 g of oxygen gas are:
 a) 6.02×10^{22} b) 6.02×10^{23} c) 12.04×10^{22} d) 12.04×10^{23}
309. The number of atoms in n moles of gas can be given by:
 a) $n \times \text{Av. no.} \times \text{atomicity}$ b) $\frac{n \times \text{Av. no.}}{\text{atomicity}}$ c) $\frac{\text{Av. no.} \times \text{atomicity}}{n}$ d) None of these
310. How many moles of $\text{Al}_2(\text{SO}_4)_3$ would be in 50 g of the substance?
 a) 0.083 mol b) 0.952 mol c) 0.481 mol d) 0.140 mol
311. The molecular weight of air will be
 (the components of air given as $\text{N}_2 - 78\%$, $\text{O}_2 - 21\%$, $\text{Ar} - 09\%$ and $\text{CO}_2 - 0.1\%$)
 a) 18.64 b) 24.968 c) 28.964 d) 29.864
312. 1.520 g of the hydroxide of a metal on ignition gave 0.995 g of oxide. The equivalent weight of metal is:
 a) 1.520 b) 0.995 c) 19.00 d) 9.00
313. The hydrated salt $\text{Na}_2\text{SO}_4 \cdot n\text{H}_2\text{O}$, undergoes 55% loss in weight on heating and becomes anhydrous. The value of n will be:
 a) 5 b) 3 c) 7 d) 10
314. When 100 g of ethylene polymerizes to polyethylene according to the equation,
 $n\text{CH}_2 = \text{CH}_2 \longrightarrow \text{-(CH}_2 - \text{CH}_2\text{)}_n\text{-}$
 The weight of polyethylene produced will be:
 a) $\frac{n}{2} \text{ g}$ b) 100 g c) $\frac{100}{n} \text{ g}$ d) $100n \text{ g}$
315. Vapour density of a volatile substance is 4 ($\text{CH}_4 = 1$). Its molecular weight would be:
 a) 8 b) 2 c) 64 d) 128
316. Dulong and Petit's law is valid only for
 a) Metals b) Non-metals c) Gaseous elements d) Solid elements
317. The molarity of pure water is:
 a) 55.6 b) 50 c) 100 d) 18

318. A molal solution is one that contains one mole of a solute in:
 a) 1000 g of the solvent
 b) 1000 mL of the solution
 c) One litre of the solvent
 d) 22.4 litre of the solution
319. The weight of a substance that displaces 22.4 litre air at NTP is:
 a) Mol. wt. b) At. wt. c) Eq. wt. d) All of these
320. The density (in g mL^{-1}) of a 3.60 M H_2SO_4 solution having 29% by mass of H_2SO_4 (molar mass 98) will be:
 a) 1.45 b) 1.64 c) 1.88 d) 1.22
321. One atom of an element weighs 1.8×10^{-22} g, its atomic mass is
 a) 29.9 b) 18 c) 108.36 d) 154
322. How many moles of electrons weigh one kilogram?
 a) 6.023×10^{23} b) $\frac{1}{9.108} \times 10^{31}$ c) $\frac{6.023}{9.108} \times 10^{54}$ d) $\frac{1}{9.108 \times 6.023} \times 10^8$
323. The number of moles of water in 488 g $\text{BaCl}_2 \cdot 2\text{H}_2\text{O}$ are:
 a) 2 b) 3 c) 4 d) 5
324. The number of molecules in 16 g of methane is:
 a) 3.0×10^{23} b) 6.02×10^{23} c) $\frac{16}{6.02} \times 10^{23}$ d) $\frac{16}{3.0} \times 10^{23}$
325. The percentage of P_2O_5 in diammonium hydrogen phosphate, $(\text{NH}_4)_2\text{HPO}_4$ is
 a) 23.48 b) 46.96 c) 53.78 d) 71.00
326. Acidified KMnO_4 oxidises oxalic acid to CO_2 . What is the volume (in litres) of 10^{-4} M KMnO_4 required to completely oxidise 0.5 L of 10^{-2} M oxalic acid in acid medium?
 a) 125 b) 1250 c) 200 d) 20
327. 0.003924 have significant figures.
 a) 6 b) 4 c) 3 d) 7
328. The formula mass of Mohr's salt is 392. The iron present in it is oxidised by KMnO_4 in acid medium. The equivalent mass of Mohr's salt is
 a) 392 b) 31.6 c) 278 d) 156
329. Matter is anything which occupies . . . A . . . and has . . . B . . .
 Here A and B are
 a) Density and mass b) Volume and mass c) Space and mass d) None of these
330. Which is not a molecular formula?
 a) $\text{C}_6\text{H}_{12}\text{O}_6$ b) $\text{Ca}(\text{NO}_3)_2$ c) $\text{C}_2\text{H}_4\text{O}_2$ d) N_2O
331. Insulin contains 3.4% sulphur. What will be the minimum molecular weight of insulin?
 a) 94.117 b) 1884 c) 941.176 d) 976
332. Which of the following contains maximum number of molecules?
 a) 100 cc of CO_2 at STP b) 150 cc of N_2 at STP c) 50 cc of SO_2 at STP d) 200 cc of NH_3 at STP
333. Weight of a single molecule of water is:
 a) 3.0×10^{-23} g b) 6.02×10^{23} g c) 6.02×10^{-23} g d) None of these
334. Air contains 20% O_2 by volume. How much volume of air will be required for 100 cc of acetylene?
 a) 500 cc b) 1064 cc c) 212.8 cc d) 1250 cc
335. 1.35 g of pure Ca metal was quantitatively converted into 1.88 g of pure CaO, what is atomic weight of Ca?
 a) 40.75 b) 50 c) 60 d) 70
336. If 250 mL of a solution contains 2.7 g of H_3PO_4 , the normality of the solution is:
 a) 4.0 b) 0.33 c) 0.4 d) 0.1
337. The weights of two elements which combine with one another are in the ratio of their:
 a) At. wt. b) Mol. wt c) Eq. wt. d) None of these
338. One litre N_2 , $\frac{7}{8}$ litre O_2 and 1 litre CO are taken in a mixture under identical conditions of P and T. The amount of gases present in mixture is given by:

- a) $w_{N_2} = w_{O_2} > w_{CO}$ b) $w_{N_2} = w_{CO} > w_{O_2}$ c) $w_{N_2} = w_{O_2} = w_{CO}$ d) $w_{CO} > w_{N_2} > w_{O_2}$
339. Volume of 0.1 M NaOH needed for the neutralisation of 20 mL of 0.05 M oxalic acid is:
 a) 10 mL b) 15 mL c) 20 mL d) 30 mL
340. The mole fraction of solute in one molal aqueous solution is:
 a) 0.009 b) 0.018 c) 0.027 d) 0.036
341. If we consider that $\frac{1}{6}$, in place of $\frac{1}{12}$, mass of carbon atom is taken to be the relative atomic mass unit, the mass of one mole of a substance will
 a) Be a function of the molecular mass or the substance
 b) Remain unchanged
 c) Increase two fold
 d) Decrease twice
342. A compound contains 54.55% carbon, 9.09 % hydrogen, 36.36% oxygen. The empirical formula of this compound is
 a) C_3H_5O b) $C_4H_8O_2$ c) $C_2H_4O_2$ d) C_2H_4O
343. The total number of protons, electrons and neutrons in 12 g of $^{12}_6C$ is:
 a) 1.084×10^{25} b) 6.022×10^{23} c) 6.022×10^{22} d) 18
344. The volume of 0.25 M H_3PO_4 required to neutralise 25 mL of 0.03 M $Ca(OH)_2$ is:
 a) 1.32 mL b) 13.2 mL c) 26.4 mL d) 2.0 mL
345. 100 mL of PH_3 when decomposed produces phosphorus and hydrogen. The change in volume is:
 a) 50 mL increase b) 500 mL decrease c) 900 mL decrease d) None of these
346. Density of a 2.05 M solution of acetic acid in water is 1.02g/mL. The molality of the solution is:
 a) 1.14 mol kg^{-1} b) 3.28 mol kg^{-1} c) 2.28 mol kg^{-1} d) 0.44 mol kg^{-1}
347. What weight of sodium hydroxide is required to neutralize 100 mL of 0.1 N HCl?
 a) 4.0 g b) 0.04 g c) 0.4 g d) 2.0 g
348. The amount of anhydrous Na_2CO_3 present in 250 mL of 0.25 M solution is :
 a) 6.625 g b) 6.0 g c) 66.25 g d) 6.225 g
349. Mole fraction of A in water is 0.2. The molality of A in water is:
 a) 13.8 b) 13.6 c) 14.0 d) 16.0
350. How many g of KCl would have to be dissolved in 60 g H_2O to give 20% by weight of solution?
 a) 15 g b) 1.5 g c) 11.5 g d) 31.5 g
351. What volume of oxygen gas (O_2) measured at 0°C and 1 atm, is needed to burn completely 1L of propane gas (C_3H_8) measured under the same conditions?
 a) 6 L b) 5 L c) 10 L d) 7 L
352. The weight of 11.2 litre of any gas at STP represents its:
 a) Gram molecular weight
 b) Gram equivalent weight
 c) Gram atomic weight
 d) Vapour density
353. The normality of 10% (weight/volume) acetic acid is:
 a) 1 N b) 10 N c) 1.7 N d) 0.83 N
354. The stoichiometry of the following reaction is
 $K_2S_2O_8(aq) + 2KI(aq) \rightarrow 2K_2SO_4(aq) + I_2(aq)$
 a) 2 : 2 b) 1 : 1 c) 1 : 2 d) 2 : 1
355. 2 mole of ethyl alcohol are present with 6 mole of water. The mole fraction of alcohol is:
 a) 0.5 b) 0.75 c) 0.15 d) 0.25
356. What is the $[OH^-]$ in the final solution prepared by mixing 20.0 mL of 0.050 M HCl with 30.0 mL of 0.10 M $Ba(OH)_2$?

- a) 0.12 M b) 0.10 M c) 0.40 M d) 0.0050 M
357. The pair of compounds which cannot exist in solution is:
 a) NaHCO_3 and NaOH b) Na_2CO_3 and NaHCO_3 c) Na_2CO_3 and NaOH d) NaHCO_3 and NaCl
358. An oxide of metal has 20% oxygen, the eq. wt. of oxide is:
 a) 32 b) 40 c) 48 d) 52
359. What weight of silver chloride will be precipitated when a solution containing 4.77 g of NaCl is added to a solution of 5.77 g of AgNO_3 ? ($\text{Na} = 23, \text{Cl} = 35.5, \text{Ag} = 108, \text{N} = 14$ and $\text{O} = 16$)
 a) 4.37 g b) 4.87 g c) 5.97 g d) 3.87 g
360. Number of molecules in 100 mL of each of O_2, NH_3 and CO_2 at STP are in the order
 a) $\text{CO}_2 < \text{O}_2 < \text{NH}_3$ b) $\text{NH}_3 < \text{O}_2 < \text{CO}_2$
 c) $\text{NH}_3 = \text{CO}_2 < \text{O}_2$ d) All have same number of molecules
361. The equivalent weight of a substance is the weight which either combines or displaces:
 a) 8 part oxygen b) 1 part hydrogen c) 35.5 part chlorine d) All of these
362. Which of the following is correct?
 a) Eq. wt. of element = $\frac{\text{at. wt.}}{\text{valence}}$
 b) Eq. wt. of compound = $\frac{\text{mol. wt.}}{\text{total charge on cation or anion}}$
 c) Eq. wt. of acid = $\frac{\text{mol. wt.}}{\text{basicity}}$
 d) Eq. wt. of base = $\frac{\text{mol. wt.}}{\text{acidity}}$
363. Which represents per cent by volume?
 a) $\frac{\text{wt. of solute}}{\text{wt. of solution}} \times 100$
 b) $\frac{\text{wt. of solute}}{\text{volume of solution}} \times 100$
 c) $\frac{\text{volume of solute}}{\text{volume of solution}} \times 100$
 d) All of the above
364. In the aqueous solution of sulphuric acid the mole fraction of water is 0.85. the molality of the solution is :
 a) 8.9 m b) 0.19 m c) 9.8 m d) 15 m
365. The number of atoms in 0.1 mol of a triatomic gas is:
 ($N_A = 6.02 \times 10^{23} \text{ mol}^{-1}$)
 a) 6.026×10^{23} b) 1.806×10^{23} c) 3.600×10^{23} d) 1.80×10^{23}
366. Which contains greatest number of oxygen atoms?
 a) 1 g of O
 b) 1 g of O_2
 c) 1 g of O_3
 d) All have the same number of atoms
367. The electrochemical equivalent of a metal is 'x' g coulomb⁻¹. The equivalent weight of metal is
 a) x b) $x \times 96500$ c) $\frac{x}{96500}$ d) $1.6 \times 10^{-19} \times x$
368. By Victor Meyer's method, one determine the vapour density if:
 a) Non-volatile solid b) All substances c) Volatile liquid d) Electrolyte
369. The percentage of oxygen in NaOH is:
 a) 40 b) 16 c) 8 d) 1
370. Sulphur forms the chlorides S_2Cl_2 and SCl_2 . The equivalent mass of sulphur in SCl_2 is 16. The equivalent mass of sulphur S_2Cl_2 is:

- a) 8 b) 16 c) 64 d) 32
371. 1.520 g of the hydroxide of a metal on ignition gave 0.995 g of oxide. The equivalent weight of metal is
 a) 1.520 b) 0.995 c) 19.00 d) 9.00
372. The product of atomic weight and specific heat of a metal is approximately 6.4. This was given by:
 a) Dalton's law b) Avogadro's law c) Newton's law d) Dulong Petit's law
373. If a mixture containing 3 moles of hydrogen and 1 mole of nitrogen is converted completely into ammonia, the ratio of initial and final volumes under the same temperature and pressure would be:
 a) 3 : 1 b) 1 : 3 c) 2 : 1 d) 1 : 2
374. The least count of an instrument is 0.01 cm. Taking all precautions, the most possible error in the measurement can be
 a) 0.005 cm b) 0.01 cm c) 0.0001 cm d) 0.1 cm
375. A metal M forms a compound M_2HPO_4 . The formula of the metal sulphate is:
 a) M_2SO_4 b) MSO_4 c) $M(SO_4)_2$ d) $M_2(SO_4)_3$
376. If the molecular weight of $Na_2S_2O_3$ and I_2 are M_1 and M_2 respectively, then what will be the equivalent weight of $Na_2S_2O_3$ and I_2 in the following reaction?
 $2S_2O_3^{2-} + I_2 \rightarrow S_4O_6^{2-} + 2I^-$
 a) M_1, M_2 b) $M_1, M_2/2$ c) $2M_1, M_2$ d) $M_1, 2M_2$
377. In the final answer of the expression $\frac{(29.2-20.2)(1.79 \times 10^5)}{1.37}$, the number of significant figures is
 a) 1 b) 2 c) 3 d) 4
378. Haemoglobin contains 0.33% of iron by weight. The molecular weight of haemoglobin is approximately 67200. The number of iron atoms (at. Wt. of $Fe = 56$) present in one molecule of haemoglobin is
 a) 6 b) 1 c) 4 d) 2
379. In the equation,
 $H_2S + 2HNO_3 \rightarrow 2H_2O + 2NO_2 + S$
 The equivalent weight of hydrogen sulphide is
 a) 18 b) 68 c) 34 d) 17
380. In a compound C, H and N are present in 9 : 1 : 3.5 by weight. If molecular weight of the compound is 108, then the molecular formula of the compound is
 a) $C_2H_6N_2$ b) C_3H_4N c) $C_6H_8N_2$ d) $C_9H_{12}N_3$
381. When 10 g of methane is completely burnt in oxygen, the heat evolved is 560 kJ. What is the heat of combustion (in $kJ\ mol^{-1}$) of methane?
 a) -1120 b) -968 c) -896 d) -560
382. How much of 0.1 M H_2SO_4 solution is required to neutralize 50 mL of 0.2 M NaOH solution?
 a) 0.50 mL b) 50 mL c) 100 mL d) 5.0 mL
383. One litre of CO_2 is passed over hot coke. The volume becomes 1.4 litre. The per cent composition of products is:
 a) 0.6 litre CO
 b) 0.8 litre CO_2
 c) 0.6 litre CO_2 and 0.8 litre CO
 d) None of the above
384. Equivalent weight of oxygen is:
 a) 32 b) 8 c) 16 d) 24
385. Arsenic forms two oxides, one of which contains 65.2% and the other 75.5% of the element. Hence, equivalent masses of arsenic are in the ratio
 a) 1 : 2 b) 3 : 5 c) 13 : 15 d) 2 : 1
386. The oxide of a metal contains 60 % of the metal. What will be the percentage of bromine in the bromide of the metal, if the valency of the metal is the same in both the oxide and the bromide?
 a) ≈ 87 b) ≈ 70 c) ≈ 77 d) ≈ 93

387. An aqueous solution of 6.3 g oxalic acid dihydrate is made up to 250 mL. The volume of 0.1 N NaOH required to completely neutralised 10 mL of this solution is:
 a) 40 mL b) 20 mL c) 10 mL d) 4 mL
388. The enthalpy of combustion of methane at 25⁰C is 890kJ. The heat liberated when 3.2 g of methane is burnt in air is
 a) 445 kJ b) 278 kJ c) -890 kJ d) 178 kJ
389. A signature written with carbon pencil weighs 1 mg, what is the number of carbon atoms present in the signature?
 a) 6.02×10^{20} b) 0.502×10^{20} c) 5.02×10^{23} d) 5.02×10^{20}
390. If 1.2 g of a metal displace 1.12 litre hydrogen at normal temperature and pressure, equivalent weight of metal would be:
 a) 12 b) 24 c) 1.2×11.2 d) $1.2 \div 11.2$
391. 34 g of hydrogen peroxide is present in 1120 mL of solution. This solution is called:
 a) 10 vol solution b) 20 vol solution c) 30 vol solution d) 32 vol solution
392. A sample of a mixture of $CaCl_2$ and $NaCl$ weighing 4.22 g was treated to precipitate all the Ca as $CaCO_3$. This $CaCO_3$ is then heated and quantitatively converted into 0.959 g of CaO . Calculate the percentage of $CaCl_2$ in the mixture.
 (Atomic mass of $Ca = 40, O = 16, C = 12$ and $Cl = 35.5$)
 a) 31.5% b) 21.5% c) 45.04% d) 68.48%
393. 11.2 litre of NH_3 at STP has electrons:
 a) 3.01×10^{21} b) 3.01×10^{22} c) 3.01×10^{25} d) 3.01×10^{24}
394. Which of the following pairs contains equal number of atoms?
 a) 11.2 cc (STP) of nitrogen and 0.015 g of nitric oxide
 b) 22.4 L (STP) of nitrous oxide and 22.4 L of nitric oxide
 c) 1 millimole of HCL and 0.5 millimole of H_2S
 d) 1 mole of H_2O_2 and 1 mole of N_2O_4
395. The number of atoms present in a molecule is called:
 a) Atomicity b) Molecularity c) Poison's ratio d) None of these
396. Which has the highest weight?
 a) 1 m³ of water b) A normal adult man c) 10 L of Hg d) All have same weight
397. 74.5 g of a metallic chloride contains 35.5 g of chlorine, the equivalent weight of the metal is
 a) 19.5 b) 35.5 c) 39 d) 78.0
398. A compound contains 69.5% oxygen and 30.5% nitrogen and its molecular weight is 92. The formula of the compound is
 a) N_2O b) NO_2 c) N_2O_4 d) N_2O_5
399. The solid like conducting state of gases with free electrons is called
 a) Sol state b) Gel state c) Plasma state d) All of these
400. A g of a metal displaces V mL of H_2 at NTP. Equivalent weight E, of metal is:
 a) $E = \frac{A}{\text{wt.of } H_2 \text{ displaced}} \times E_H$
 b) $E = \frac{A \times 1.008 \times 22400}{\text{volume of } H_2 \text{ displaced} \times 2}$
 c) $E = \frac{A \times 1.008}{\text{volume of } H_2 \text{ displaced} \times 0.0000897}$
 d) All of the above
401. The formula which represents the simple ratio of atoms in a compound is called:
 a) Molecular formula b) Structure formula c) Empirical formula d) Rational formula
402. How many mole of atoms are in a mole of CH_3COOH molecule?
 a) 2 moles of C atoms, 4 moles of H atoms, 2 moles of O atoms
 b) 1 mole of C atom, 2 moles of H atoms, 1 mole of O atom

- c) 2 moles of C atom, 3 moles of H atoms, 2 moles of O atoms
d) None of the above
403. If the density of water is 1 g cm^{-3} then the volume occupied by one molecule of water is approximately
a) 18 cm^3 b) 22400 cm^3 c) $6.02 \times 10^{-23} \text{ cm}^3$ d) $3.0 \times 10^{-23} \text{ cm}^3$
404. What will be the normality of a solution obtained by mixing 0.45 N and 0.60 N NaOH in the ratio 2 : 1 by volume?
a) 0.4 N b) 0.5 N c) 1.05 N d) 0.15 N
405. For the reaction,
 $X + 2Y \rightarrow Z$
5 Moles of X and 9 moles of Y will produce
a) 5 moles of Z b) 8 moles of Z c) 14 moles of Z d) 4 moles of Z
406. A student performs a titration with different burettes and finds titre values of 25.2 mL, 25.25 mL, and 25.0mL. The number of significant figures in the average titre value is
a) 1 b) 2 c) 3 d) 4
407. 100 mL of 20.8% BaCl_2 solution and 50 mL of 9.8% H_2SO_4 Solution will form BaSO_4
(Ba = 137, Cl = 35.5, S = 32, H = 1, O = 16)
 $\text{BaCl}_2 + \text{H}_2\text{SO}_4 \rightarrow \text{Ba}_2\text{SO}_4 + 2\text{HCl}$
a) 23.3 g b) 11.65 g c) 30.6 g d) None of these
408. n gram of a substance X reacts with m gram of substance Y to form p gram of substance R and q gram of substance S . This reaction can be represented as follows
 $X + Y = R + S$
The relation which can be established in the amounts of the reactants and the products will be
a) $n - m = p - q$ b) $n + m = p + q$ c) $n = m$ d) $p = q$
409. On adding 20 mL of 0.1 N NaOH solution to 10 mL of 0.1 N HCl, the resulting solution will:
a) Turn blue litmus red
b) Turn phenolphthalein solution pink
c) Turn methyl orange red
d) Will have no effect on red or blue litmus paper
410. The number of atoms in 558.5 g of Fe (at.wt. 55.85) is:
a) Twice that in 60 g carbon
b) 6.022×10^{22}
c) Half in 8 g He
d) $558.5 \times 6.023 \times 10^{23}$
411. If 20% nitrogen is present in a compound, it's minimum molecular weight will be:
a) 144 b) 28 c) 100 d) 70
412. The dehydration yield of cyclohexanol to cyclohexene is 75%. What would be the yield, if 100 g of cyclohexanol is dehydrated?
a) 61.7 g b) 16.5 g c) 6.15 g d) 615 g
413. A mixture containing 100 g H_2 and 100 g O_2 is ignited so that water is formed according to the reaction,
 $2\text{H}_2 + \text{O}_2 \rightarrow 2\text{H}_2\text{O}$; How much water will be formed?
a) 113 g b) 50 g c) 25 g d) 200 g
414. The numerical value of $\frac{N}{n}$ (where, N is the number of molecules in a given sample of gas and n is the number of moles of the gas) is
a) 8.314 b) 6.02×10^{23} c) 0.0821 d) 1.66×10^{-19}
415. The ionic strength of Na^+ on mixing 100 mL 0.1 M NaCl and 100mL 0.1 M Na_2SO_4 is:
a) 0.2 b) 0.1 c) 0.3 d) 0.075
416. Number of g-atom of S present in 49 g H_2SO_4 are:
a) 0.5 b) 1 c) 0.2 d) 0.3
417. 276 g of silver carbonate on being strongly heated yields a residue weighing

- a) 3.54 g b) 3.0 g c) 1.36 g d) 2.16 g
418. The mole fraction of oxygen in a mixture of 7 g of nitrogen and 8 g of oxygen is:
a) 8/5 b) 0.5 c) 0.25 d) 1.0
419. 0.5 g of fuming H_2SO_4 (oleum) is diluted with water. This solution is completely neutralized by 26.7 mL of 0.4 N NaOH. The percentage of free SO_3 in the sample is:
a) 30.6% b) 40.6% c) 20.6% d) 50%
420. The mass of BaCO_3 produced when excess CO_2 is bubbled through a solution of 0.205 mole $\text{Ba}(\text{OH})_2$ is,
a) 81 g b) 40.5 g c) 20.25 g d) 162 g
421. An example of homogeneous mixture is
a) Mixture of soil and water b) Mixture of salt and sand grains
c) Sugar solution d) None of the above
422. The molarity of a solution containing 5.3 g of anhydrous Na_2CO_3 per litre is :
a) 0.01 M b) 0.05 M c) 0.02 M d) 1 M
423. To what extent must a given solution containing 40 mg AgNO_3 per mL be diluted to yield a solution containing 16 mg AgNO_3 per mL?
a) Each mL must be diluted to 2.5 mL
b) To each mL of solution 2.5 mL of water should be added
c) To 1.5 mL of solution 2.5 mL of water should be added
d) To 1.5 mL of solution 1.5 mL of water should be added
424. In the reaction,
 $\text{I}_2 + 2\text{S}_2\text{O}_3^{2-} \rightarrow 2\text{I}^- + \text{S}_4\text{O}_6^{2-}$
Equivalent weight of iodine will be equal to
a) Molecular weight b) 1/2 of molecular weight
c) 1/4 of molecular weight d) Twice of molecular weight
425. Mol. wt. = vapour density $\times 2$, is valid for:
a) metals b) non-metals c) Solids d) Gases
426. The volume of oxygen required for complete oxidation of 2.0 litre methane at NTP is:
a) 12.25 litre b) 4 litre c) 1 litre d) 3 litre
427. One mole of a mixture of CO and CO_2 requires exactly 20 g of NaOH in solution for complete conversion of all the CO_2 into Na_2CO_3 . How much NaOH would it require for conversion into Na_2CO_3 , if the mixture (one mole) is completely oxidised to CO_2 ?
a) 60 g b) 80 g c) 40 g d) 20 g
428. The equivalent weight of H_3PO_4 in the following reaction is,
 $\text{H}_3\text{PO}_4 + \text{Ca}(\text{OH})_2 \rightarrow \text{CaHPO}_4 + 2\text{H}_2\text{O}$:
a) 98 b) 49 c) 32.66 d) 40
429. 1.0 g of hydrogen contains 6×10^{23} atoms. The atomic weight of helium is 4. It follows that the number of atoms in 1 g of He is:
a) $1/4 \times 6 \times 10^{23}$ b) $4 \times 6 \times 10^{23}$ c) 6×10^{23} d) 12×10^{23}
430. The hardness of water is usually expressed in:
a) ppm b) g/litre c) Mol/litre d) None of these
431. An element forms an oxide, in which the oxygen is 20% of the oxide by weight, the equivalent weight of the given element will be:
a) 32 b) 40 c) 60 d) 128
432. The ratio of amounts of H_2S needed to precipitate all the metals ions from 100 mL of 1 M AgNO_3 and 100 mL of 1 M CuSO_4 is:
a) 1 : 2 b) 2 : 1 c) Zero d) Infinite
433. 5.6 litre of oxygen at NTP is equivalent to:
a) 1 mole b) 1/2 mole c) 1/4 mole d) 1/8 mole
434. A solution of HCl containing 0.03659 g/mL and another solution of acetic acid containing 0.04509 g/mL,

then:

- a) N_{HCl} is more b) $N_{\text{CH}_3\text{COOH}}$ is more c) Both have same N d) None of these
435. The equivalent weight of an acid is obtained by dividing its mol. wt. by its:
a) Acidity b) Basicity c) pH d) None of these
436. For the reaction, $\text{Fe}_2\text{O}_3 + 3\text{CO} \rightarrow 2\text{Fe} + 3\text{CO}_2$ the volume of carbon monoxide required to reduce one mole of ferric oxide is
a) 22.4 dm^3 b) 44.8 dm^3 c) 67.2 dm^3 d) 11.2 dm^3
437. 224 mL of a triatomic gas weights 1 g at 273 K and 1 atm . The mass of one atom of this gas is:
a) $8.30 \times 10^{-23}\text{ g}$ b) $2.08 \times 10^{-23}\text{ g}$ c) $5.53 \times 10^{-23}\text{ g}$ d) $6.24 \times 10^{-23}\text{ g}$
438. The empirical formula of a compound is CH_2 . One mole of this compound has a mass of 56 g , its molecular formula is
a) C_3H_6 b) C_4H_8 c) CH_2 d) C_2H_2
439. Which has maximum number of atoms?
a) 2.0 mol of S_8 b) 6.0 mol of S c) 5.5 mol of SO_2 d) 4.48 L of CO_2 at 5 TP
440. Which represents per cent by weight?
a) $\frac{\text{wt. of solute}}{\text{wt. of solution}} \times 100$
b) $\frac{\text{wt. of solute}}{\text{volume of solution}} \times 100$
c) $\frac{\text{volume of solute}}{\text{volume of solution}} \times 100$
d) None of the above
441. How many g are present in one mole of MgSO_4 ?
a) 120.4 b) 130.2 c) 12.04 d) 360
442. A solution contains one mole of alcohol and four moles of water. What are the mole fractions of water and alcohol?
a) $1/4, 4/1$ b) $4/1, 1/4$ c) $4/5, 1/5$ d) $1/5, 4/5$
443. Approximate atomic weight of an element is 26.89 . If its equivalent weight is 8.9 the exact atomic weight of element would be:
a) 26.89 b) 8.9 c) 17.8 d) 26.7
444. 0.75 moles of a solid A_4 and 2 moles of $\text{O}_2(g)$ are heated in a sealed vessel, completely using up the reactants and produces only one compound. It is found that when the temperature is used to initial temperature, the contents of the vessel exhibit a pressure equal to $\frac{1}{2}$ of the original pressure. The formula of the product will be
a) A_2O_3 b) A_3O_8 c) A_3O_4 d) AO_2
445. 25.3 g solution carbonate, Na_2CO_3 was dissolved in enough water to make 250 mL of solution. If sodium carbonate dissociates completely, molar concentration of Na^+ and carbonate ions are respectively. (mol. mass of $\text{Na}_2\text{CO}_3 = 106\text{ g mol}^{-1}$)
a) 0.9555 M and 1.910 M
b) 1.910 M and 0.955 M
c) 1.90 M and 1.1910 M
d) 0.477 M and 0.477 M
446. NO reacts with O_2 to form NO_2 . When 10 g of NO_2 is formed during the reaction, the mass of O_2 consumed is
a) 1.90 g b) 5.0 g c) 3.48 g d) 13.9 g
447. Two solutions of a substance (non-electrolyte) are mixed in the following manner. 480 mL of 1.5 M of I solution with 520 mL of 1.2 M of II solution. The molarity of final solution is:
a) 1.20 M b) 1.50 M c) 1.344 M d) 2.70 M
448. A vogadro's number is the number of molecules present in:
a) 22.4 litre of a gas of NTP

- b) 1 mole of a substance
 c) G mol. wt. of a substance
 d) All of the above
449. Camphor is often used in molecular mass determination because
 a) It is readily available
 b) It has a very high cryoscopic constant
 c) It is volatile
 d) It is solvent for organic substances
450. The molality of 1 M solution of NaCl (specific gravity 1.0585) g/mL is:
 a) 1.0585
 b) 1.0
 c) 0.10
 d) 0.0585
451. An organic compound contains 49.3% carbon, 6.84% hydrogen and its vapour density is 73. Molecular formula of the compound is
 a) $C_3H_5O_2$
 b) $C_4H_{10}O_2$
 c) $C_6H_{10}O_4$
 d) $C_3H_{10}O_2$
452. How many g of glucose be dissolved to make one litre solution of 10% (wt./vol.) glucose?
 a) 10 g
 b) 180 g
 c) 100 g
 d) 1.8 g
453. How many atoms are contained in a mole of $Ca(OH)_2$?
 a) $30 \times 6.02 \times 10^{23}$ atom/mol
 b) $5 \times 6.02 \times 10^{23}$ atom/mol
 c) $3 \times 6.02 \times 10^{23}$ atom/mol
 d) None of the above
454. The normality of 0.3 M phosphorous acid (H_3PO_3) is :
 a) 0.1
 b) 0.9
 c) 0.3
 d) 0.6
455. 0.84 g of a metal carbonate reacts with 40 mL of $\frac{1}{2}$ H_2SO_4 . The equivalent weight of metal carbonate is:
 a) 84 g
 b) 64 g
 c) 42 g
 d) 38 g
456. If $\frac{1}{6}$ in place of $\frac{1}{12}$ mass of carbon atom is taken to be the relative atomic mass unit, the mass of one mole of a substance will:
 a) Decrease twice
 b) Increases two folds
 c) Remains unchanged
 d) Be a function of the molecular mass of element
457. A gas is found to have formula $[CO]_x$. Its vapour density is 70, the x is
 a) 3.0
 b) 3.5
 c) 5.0
 d) 6.5
458. 2 g of metal carbonate is neutralised completely by 100mL of 0.1 (N) HCl. The equivalent weight of metal carbonate is
 a) 50
 b) 100
 c) 150
 d) 200
459. The smallest matter particle that can take part in chemical reaction is
 a) Atom
 b) Molecule
 c) Both (a) and (b)
 d) None of these
460. The equivalent weight of a solid element is found to be 9. If the specific heat of this element is $1.05 \text{ Jg}^{-1}\text{K}^{-1}$, then its atomic weight is
 a) 17
 b) 21
 c) 25
 d) 27
461. The largest number of molecules are in:
 a) 36 g H_2O
 b) 28 g CO
 c) 46 g C_2H_5OH
 d) 54 g N_2O_5
462. Vapour density of a metal chloride is 66. Its oxide contains 53% metal. The atomic weight of the metal is:
 a) 21
 b) 54
 c) 27.06
 d) 2.706
463. The number of Cl^- and Ca^{2+} ions in 222 g $CaCl_2$ are :
 a) 4 N, 2 N
 b) 2 N, 4 N
 c) 1 N, 2 N
 d) 2 N, 1 N
464. How many gram of KCL would have to be dissolved in 60 g H_2O to give 40% by weight of solution?
 a) 40 g
 b) 20 g
 c) 15 g
 d) 10 g
465. The units J Pa^{-1} is equivalent to
 a) m^3
 b) cm^3
 c) dm^3
 d) None of these
466. If 250 mL of a solution contains 24.5 g H_2SO_4 , the molarity and normality respectively are:
 a) 1 M, 2 N
 b) 1 M, 0.5 N
 c) 0.5 M, 1 N
 d) 2 M, 1 N

467. Equivalent weight of bivalent metal is 32.7. Molecular weight of its chloride is :
 a) 68.2 b) 103.7 c) 136.4 d) 166.3
468. Insulin contains 3.4% Sulphur. The minimum mol. weight of insulin is:
 a) 941.176 b) 944 c) 945.27 d) None of these
469. How many moles of magnesium phosphate, $Mg_3(PO_4)_2$ will contain 0.25 mole of oxygen atoms?
 a) 0.02 b) 3.125×10^{-2} c) 1.25×10^{-2} d) 2.5×10^{-2}
470. The gram molecular weight of hydrogen peroxide is 34. What is the unit of gram molecular weight?
 a) g b) mole c) $g \text{ mol}^{-1}$ d) mol g
471. Which one of the following has maximum number of atoms of oxygen?
 a) 2 g of carbon monoxide b) 2 g of carbon dioxide
 c) 2 g of sulphur dioxide d) 2 g of water
472. Equal volumes of 0.1 M $AgNO_3$ and 0.2 M NaCl are mixed. The concentration of NO_3^- ions in the mixture will be:
 a) 0.1 M b) 0.05 M c) 0.2 M d) 0.15 M
473. The equivalent mass of chlorine is 35.5 and the atomic mass of copper is 63.5. the equivalent mass of copper chloride is 99.0. hence, formula of copper chloride is
 a) CuCl b) Cu_2Cl c) $CuCl_2$ d) None of these
474. The reaction between yttrium metal, Y and dilute hydrochloric acid produces $H_2(g)$ and Y^{3+} ions. The molar ratio of yttrium used to hydrogen produces is
 a) 1 : 2 b) 1 : 3 c) 2 : 1 d) 2 : 3
475. Two elements X (atomic weight = 75) and Y (atomic weight =16) combine to give a compound having 75.8% of X. The formula of the compound is:
 a) XY b) X_2Y c) X_2Y_2 d) X_2Y_3
476. Which of the following has the smallest number of molecules?
 a) 0.1 mole of CO_2 gas b) 11.2 L of CO_2 gas at STP
 c) 22 g of CO_2 gas d) 22.4×10^3 mL of CO_2 gas at STP
477. Sodium nitrate on reduction with Zn in presence of NaOH solution produces NH_3 . Mass of sodium nitrate absorbing 1 mole of electron will be
 a) 7.750 b) 10.625 c) 8.000 d) 9.875
478. The percentage of nitrogen in urea is about:
 a) 38.4 b) 46.6 c) 59.1 d) 61.3
479. What volume of 0.8 M solution contains 0.1 milli mole of solute?
 a) 100 mL b) 125 mL c) 500 mL d) 0.125 mL
480. The equivalent weight of an element can be calculated from:
 a) 6.4 divided by specific heat and valence
 b) Atomic weight divided by atomicity
 c) Molecular weight divided by atomicity, all divided by the valence
 d) None of the above
481. 4 g-atom of Ag contains:
 a) 108 g b) 4 g c) 432 g d) None of these
482. The correctly reported answer of the addition of 4.523, 2.3 and 6.24 will have significant figures
 a) Two b) Three c) Four d) Five
483. Weight of H_2O in 1000 kg $CuSO_4 \cdot 5H_2O$ is:
 a) 360.5 kg b) 36.05 kg c) 3605 kg d) 3.605 g
484. 3.0 molal NaOH solution has a density of 1.110 g/mL. The molarity of the solution is:
 a) 2.9732 b) 3.05 c) 3.64 d) 3.0504
485. An oxide of a metal (M) contains 40% by mass of oxygen. Metal (M) has atomic mass of 24. The empirical formula of the oxide is:
 a) M_2O b) MO c) M_2O_3 d) M_3O_4
486. The vapour density of a gas is given by:

- a) $VD = \text{mol. wt.}/2$
 b) $VD = \frac{\text{wt. of } N \text{ molecules of gas}}{\text{wt. of } N \text{ molecules of } H_2}$
 c) $VD = \frac{\text{wt. of 1 mole of gas}}{\text{wt. of 1 mole of } H_2}$
 d) All of the above
487. In the disproportionation reaction $3HClO_3 \rightarrow HClO_4 + Cl_2 + 2O_2 + H_2O$, the equivalent mass of the oxidising agent is (molar mass of $HClO_3 = 84.45$)
 a) 16.89 b) 32.22 c) 84.45 d) 28.15
488. How many atoms are contained in a mole of acetic acid?
 a) $8 \times 6.02 \times 10^{23}$ atom/mol
 b) $4 \times 6.02 \times 10^{23}$ atom/mol
 c) $6 \times 6.02 \times 10^{23}$ atom/mol
 d) None of the above
489. Specific gravity of solution is given by:
 a) Weight of 1 mL solution
 b) Mole present in 1 mL solution
 c) Volume of 1 g solution
 d) None of the above
490. Which property of an element is always a whole number?
 a) Atomic volume b) Atomic weight c) Atomic number d) Equivalent weight
491. An aqueous solution of urea containing 18 g urea in 1500 cm^3 of solution has a density of 1.052 g/cm^3 . If the molecular weight of urea is 60, then the molality of solution is:
 a) 0.2 b) 0.192 c) 0.064 d) 1.2
492. The relative abundance of two isotopes of atomic weight 85 and 87 is 75% and 25% respectively. The average atomic weight of element is
 a) 75.5 b) 85.5 c) 40.0 d) 86.0
493. A molar solution represents a solution of molarity equal to:
 a) 1 b) 2 c) 3 d) None of these
494. The answer of the calculation $\frac{2.568 \times 5.8}{4.168}$ in significant figures will be
 a) 3.579 b) 3.570 c) 3.57 d) 3.6
495. 14 g of element X combine with 16 g of oxygen. On the basis of this information, which of the followings is a correct statement?
 a) The element X could have an atomic weight of 7 and its oxide is XO
 b) The element X could have an atomic weight of 14 and its oxide formula is X_2O
 c) The element X could have an atomic weight of 7 and its oxide is X_2O
 d) The element X could have an atomic weight of 14 and its oxide is XO_2
496. Consider the following data:
- | Element | Atomic weight |
|---------|---------------|
| A | 12 |
| B | 35.5 |
- A and B combine to form a new substance X . If four moles of B combine with one mole of A to give one mole of X , then the weight of one mole of X is:
 a) 47.5 g b) 83 g c) 154 g d) 166 g
497. One mole of P_4 molecules contain:
 a) 1 molecule
 b) 4 molecules
 c) $\frac{1}{4} \times 6.022 \times 10^{23}$ atoms
 d) 24.088×10^{23} atoms

498. Molecular weight of NaCl is 58.5. A solution of NaCl containing 5.85 g NaCl per litre is :
 a) 1 molar b) 0.1 molar c) 2 molar d) 0.585 molar
499. The solution having lowest molar concentration is:
 a) 1.0 N HCl b) 0.4 N H₂SO₄ c) 0.1 N Na₂CO₃ d) None of these
500. The value of amu is which of the following?
 a) 1.57×10^{-24} kg b) 1.66×10^{-24} kg c) 1.99×10^{-23} kg d) 1.66×10^{-27} kg
501. How many g are present in one mole of Ag?
 a) 107.9 b) 108.6 c) 10.29 d) None of these
502. One mole of chlorine combines with certain weight of metal giving 111 g of its chloride. The same amount of metal can displace 2 g of hydrogen from an acid. The atomic weight of the metal is:
 a) 40 b) 20 c) 80 d) None of these
503. Equivalent weight of anhydrous oxalic acid is:
 a) 45 b) 63 c) 126 d) 90
504. Molarity is expressed as:
 a) Litre mol⁻¹ b) Mol litre⁻¹ c) Mol kg⁻¹ d) G litre⁻¹
505. H₃PO₄ is a tribasic acid and one of its salts is NaH₂PO₄. What volume of 1 M NaOH should be added to 12 g NaH₂PO₄ (mol. wt. 120) to exactly convert it into Na₃PO₄ ?
 a) 100 mL b) 300 mL c) 200 mL d) 80 mL
506. How many atoms are contained in one mole of sucrose (C₁₂H₂₂O₁₁)?
 a) $45 \times 6.02 \times 10^{23}$ atom/mol
 b) $20 \times 6.02 \times 10^{23}$ atom/mol
 c) $5 \times 6.02 \times 10^{23}$ atom/mol
 d) None of the above
507. What is the volume (in litres) of oxygen required at STP to completely convert 1.5 moles of sulphur into sulphur dioxide?
 a) 11.2 b) 22.4 c) 33.6 d) 44.8
508. What is the number of moles of Fe(OH)₃(s) that can be produced by allowing 1 mole of Fe₂S₃, 2 moles of H₂O and 3 moles of O₂ to react as
 $2\text{Fe}_2\text{S}_3 + 6\text{H}_2\text{O} + 3\text{O}_2 \rightarrow 4\text{Fe}(\text{OH})_3 + 6\text{S}$
 a) 1 mol b) 1.84 mol c) 1.34 mol d) 1.29 mol
509. The number of molecules of CO₂ present in 44 g of CO₂ is
 a) 6.0×10^{23} b) 3×10^{23} c) 12×10^{23} d) 3×10^{10}
510. 1 L oxygen gas at STP will weigh
 a) 1.43 g b) 2.24 g c) 11.2 g d) 22.4 g
511. Which has maximum number of atoms?
 a) 24 g of C b) 56 g of Fe c) 26 g of Al d) 108 g of Ag
512. In multiplication and division, the significant figures of answer must be same as that in the quantity with Number of significant figures.
 a) Maximum b) 3 c) 2 d) Minimum
513. A solution of known normality is diluted to two times. Which of the following changes during dilution?
 a) Equivalent of solute
 b) Moles of solute
 c) Volume of 1 g solution
 d) None of the above
514. The number of moles of oxygen in one litre of air containing 21% oxygen by volume, in standard conditions, is
 a) 0.186 mol b) 0.21 mol c) 2.10 mol d) 0.0093 mol
515. One gram mole of a gas at NTP occupies 22.4 L. This fact was derived from
 a) Law of gaseous volumes b) Avogadro's hypothesis
 c) Berzelius hypothesis d) Dalton's atomic theory

516. What is the equivalent weight of SnCl_2 in the following reaction,
 $\text{SnCl}_2 + \text{Cl}_2 \rightarrow \text{SnCl}_4$?
- a) 95 b) 45 c) 60 d) 30
517. The standard adopted for the determination of atomic weight of elements is based on
- a) H^1 b) C^{12} c) O^{16} d) S^{32}
518. What amount of bromine will be required to convert 2 g of phenol into 2, 4, 6-tribromo phenol?
- a) 20.44 g b) 6.00 g c) 4.00 g d) 10.22 g
519. Equivalent weight of an acid:
- a) Depends on the reaction involved with a base
 b) Depends on the number of oxygen atoms present
 c) Is always constant
 d) None of the above
520. The highest mass corresponds to which of the following?
- a) 1 molecule of O_2
 b) 1×10^{-23} g mole of O_2
 c) An O^{2-} ion
 d) 1 mole of O_2
521. The number of molecules in 4.25 g of ammonia is approximately:
- a) 3.5×10^{23} b) 1.5×10^{23} c) 0.5×10^{23} d) 2.5×10^{23}
522. If V mL of the vapours of substance at NTP weight W g. Mol. wt. of substance is:
- a) $(W/V) \times 22400$ b) $V/W = 22400$ c) $(W - V) \times 22400$ d) $\frac{W \times 1}{V \times 22400}$
523. Sodium bicarbonate on heating decomposes to form sodium carbonate, CO_2 and water. If 0.2 moles of sodium bicarbonate is completely decomposed, how many moles of sodium carbonate is formed?
- a) 0.1 b) 0.2 c) 0.05 d) 0.025
524. The reaction of calcium with water is represented by the equation,
 $\text{Ca} + 2\text{H}_2\text{O} \rightarrow \text{Ca}(\text{OH})_2 + \text{H}_2$
 What volume of H_2 , at STP would be liberated when 8 g of calcium completely reacts with water?
- a) 4480 cm^3 b) 2240 cm^3 c) 1120 cm^3 d) 0.4 cm^3
525. The isotopic abundance of C-12 and C-14 is 98% and 2% respectively. What would be the number of C-14 isotope in 12 g carbon sample?
- a) 1.032×10^{22} b) 3.01×10^{23} c) 5.88×10^{23} d) 6.02×10^{23}