

Some Basic Concepts of Chemistry

Q.1. In which of the following number all zeros are significant?

- a) 0.0005
- b) 0.0500
- c) 50.000
- d) 0.0050

Q.2. A compound made up of two elements A and B is found to contain 25% A (atomic mass = 12.5) and 75% B (atomic mass = 37.5). The simplest formula of the compound is

- a) AB
- b) AB₂
- c) AB₃
- d) A₃B

Q.3. If 0.5 mol of BaCl₂ is mixed with 0.2 mol of Na₃PO₄ then maximum number of moles of Ba₃(PO₄)₂ that can be formed is

- a) 0.7
- b) 0.5
- c) 0.3
- d) 0.1

Q.4. A gas mixture of 3 litres of propane (C₃H₈) and butane (C₄H₁₀) on complete combustion at 25° C produced 10 litre CO₂. Find out the composition of gas mixture (Propane : Butane)

- a) 2 : 1
- b) 1:2
- c) 1.5 : 1.5
- d) 0.5 : 2.5

Q.5. 1.575 g of oxalic acid (COOH)₂.xH₂O are dissolved in water and the volume made up to 250 ml. On titration 16.68 ml of this solution requires 25 ml of N/15 NaOH solution for complete neutralization calculate x.

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

Q.6. The vapour density of a mixture containing NO_2 and N_2O_4 is 27.6. Mole fraction of NO_2 in the mixture is

- a) 0.8
- b) 0.6
- c) 0.4
- d) 0.2

Q.7. A chloride of a metal (M) contain 65.5% of chlorine. 100 ml of vapour of the chloride of metal at STP weights 0.72 g. The molecular formula of the metal chloride is

- a) MCl_4
- b) MCl_3
- c) MCl_2
- d) MCl

Q.8. gaseous hydrocarbon gives upon combustion 0.72 g of water and 3.08 g. of CO_2 . The empirical formula of the hydrocarbon is :

- a) C_2H_4
- b) C_3H_4
- c) C_6H_5
- d) C_7H_8

Q.9. The density (in g mL^{-1}) of a 3.60 M sulphuric acid solution that is 29% H_2SO_4 (molar mass = 98 g mol^{-1}) by mass will be

- a) 1.45
- b) 1.64
- c) 1.88
- d) 1.22

Q.10. Experimentally it was found that a metal oxide has formula $\text{M}_{.98}\text{O}$. Metal M, present as M^{2+} and M^{3+} in its oxide. Fraction of the metal which exists as M^{3+} would be :

- a) 7.01%
- b) 4.08%
- c) 3.06
- d) 5.08%

Q.11. 30ml of a gaseous hydrocarbon requires 90 ml of oxygen for complete combustion and 60 ml CO_2 is formed in this process. The molecular formula of the hydrocarbon is

- a) C_2H_2
- b) C_2H_4
- c) C_2H_6
- d) CH_4

Q.12. The equivalent weight of a metal is 4.5 and the molecular weight of its chloride is 80. The atomic weight of the metal is

- a) 18
- b) 9
- c) 4.5
- d) 36

Q.13. 18.72 g of a substance 'X' occupies 1.81 cm^3 . What will be its density measured in correct significant figures?

- a) 10.3 gcm^{-3}
- b) 10.34 gcm^{-3}
- c) 10.4 gcm^{-3}
- d) 10.3425 gcm^{-3}

Q.14. If 40 g of CaCO_3 is treated with 40 g of HCl. Which of the reactants will act as limiting reagent?

- a) CaCO_3
- b) HCl
- c) Both are equal
- d) Cannot be calculated

Q.15. The final molarity of a solution made by mixing 50 mL of 0.5 M HCl, 150 mL of 0.25 M HCl and water to make the volume 250 mL is

- a) 0.5 M
- b) 1 M
- c) 0.75 M
- d) 0.25 M

Q.16. 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_5

Q.17. The ratio of the molar amounts of H_2S needed to precipitate the metal ions from 20 ml each of 1 M $\text{Ca}(\text{NO}_3)_2$ and 0.5M CuSO_4 is

- a) 1:1
- b) 2:1
- c) 1:2
- d) indefinite

Q.18. 1.12 ml of a gas is produced at S.T.P. by the action of 4.12 mg of alcohol ROH with methyl magnesium iodide. The molecular mass of alcohol is

- a) 16.0
- b) 41.2
- c) 82.4
- d) 156.0

Q.19. How many ml of 0.1N HCl are required to react completely with 1 g mixture of Na_2CO_3 and NaHCO_3 containing equimolar amounts of two ?

- a) 157.7
- b) 15.77
- c) 147.7
- d) 14.77

Q.20. The hydrated salt $\text{Na}_2\text{CO}_3 \cdot x\text{H}_2\text{O}$ undergoes 63% loss in mass on heating and becomes anhydrous. The value of x is

- a) 10
- b) 7
- c) 5
- d) 3

Q.21. A 100 ml solution of 0.1 N HCl was titrated with 0.2 N NaOH solution. The titration was discontinued after adding 30 ml of NaOH solution. The remaining titration was completed by adding 0.25 N KOH solution. The volume of KOH (in ml) required for completing the titration is

- a) 16
- b) 32
- c) 35
- d) 70

Q.22. In order to prepare one litre normal solution of KMnO_4 , how many grams of KMnO_4 are required if the solution is to be used in acid medium for oxidation?

- a) 158.0
- b) 62.0
- c) 31.6
- d) 790

Q.23. 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) 3.325
- b) 33.25
- c) 12
- d) 20

Q.24. Number of moles of KMnO_4 required to oxidize one mole of $\text{Fe}(\text{C}_2\text{O}_4)$ in acidic medium is

- a) 0.167
- b) 0.6
- c) 0.2
- d) 0.4

Q.25. 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) 2
- d) 4