

1. The highest number of helium atoms is in **(2024)**
(a) 4 u of helium
(b) 4 g of helium
(c) 2.271098 L of helium at STP
(d) 4 mol of helium
2. 1 gram of sodium hydroxide was treated with 25 mL of 0.75 M HCl solution, the mass of sodium hydroxide left unreacted is equal to **(2024)**
(a) 250 mg (b) Zero mg
(c) 200 mg (d) 750 mg
3. A compound X contains 32% of A, 20% of B and remaining percentage of C. Then, the empirical formula of X is: (Given atomic masses of A = 64; B = 40; C = 32 u) **(2024)**
(a) ABC₃ (b) AB₂C₂
(c) ABC₄ (d) A₂BC₂
4. The density of 1 M solution of a compound 'X' is 1.25 g mL⁻¹. The correct option for the molality of solution is (Molar mass of compound X = 85 g): **(2023)**
(a) 0.705 m (b) 1.208
(c) 1.165 m (d) 0.858 m
5. The right option for the mass of CO₂ produced by heating 20 g of 20% pure limestone is (Atomic mass of Ca = 40)
$$\left[\text{CaCO}_3 \xrightarrow{1200\text{K}} \text{CaO} + \text{CO}_2 \right]$$
 (2023)
(a) 1.76 g (b) 2.64 g
(c) 1.32 g (d) 1.12 g
6. The density of the solution is 2.15 g mL⁻¹, then mass of 2.5 mL solution in correct significant figures is: **(2022)**
(a) 53.75 g
(b) 5375 × 10⁻³ g
(c) 5.4 g
(d) 5.38 g
7. What fraction of Fe exists as Fe(III) in Fe_{0.96}O? (Consider Fe_{0.96}O to be made up of Fe(II) and Fe(III) only) **(2022)**
(a) 1/20 (b) 1/12
(c) 0.08 (d) 1/16
8. In one molal solution that contains 0.5 mole of a solution, there is **(2022)**
(a) 500 mL of solvent
(b) 500 g of solvent
(c) 100 mL of solvent
(d) 1000 g of solvent
9. What mass of 95% pure CaCO₃ will be required to neutralise 50 mL of 0.5 M HCl solution according to the following reaction?
$$\text{CaCO}_3(\text{s}) + 2\text{HCl}(\text{aq}) \rightarrow \text{CaCl}_2(\text{aq}) + \text{CO}_2(\text{g}) + 2\text{H}_2\text{O}(\text{l})$$

[Calculate upto second place of decimal point] **(2022)**
(a) 1.25 g (b) 1.32 g
(c) 3.65 g (d) 9.50 g
10. An organic compound contains 78% (by wt.) carbon and remaining percentage of hydrogen. The right option for the empirical formula of this compound is: [Atomic wt. of C is 12, H is 1] **(2021)**
(a) CH₂ (b) CH₃
(c) CH₄ (d) CH
11. Which one of the followings has maximum number of atoms? **(2020)**
(a) 1 g of Mg(s) [Atomic mass of Mg = 24]
(b) 1 g of O₂(g) [Atomic mass of O = 16]
(c) 1 g of Li(s) [Atomic mass of Li = 7]
(d) 1 g of Ag(s) [Atomic mass of Ag = 108]
12. One mole of carbon atom weighs 12g, the number of atoms in it is equal to. (Mass of carbon-12 is 1.9926 × 10⁻²³ g) **(2020 Covid Re-NEET)**
(a) 6.022 × 10²²
(b) 12 × 10²²
(c) 6.022 × 10²³
(d) 12 × 10²³
13. The number of moles of hydrogen molecules required to produce 20 moles of ammonia through Haber's process is : **(2019)**
(a) 10 (b) 20
(c) 30 (d) 40

- 14.** A mixture of 2.3 g formic acid and 4.5 g oxalic acid is treated with conc. H_2SO_4 . The evolved gaseous mixture is passed through KOH pellets. Weight (in g) of the remaining product at STP will be : **(2018)**
 (a) 1.4 (b) 3.0
 (c) 4.4 (d) 2.8
- 15.** In which case is number of molecules of water maximum? **(2018)**
 (a) 18 mL of water
 (b) 0.18 g of water
 (c) 10^{-3} mole of water
 (d) 0.00224 L of water vapours at 1 atm and 273 K
- 16.** A hydrocarbon contains 85.7% of Carbon and 14.3% of Hydrogen. If 42 mg of the compound contains 3.01×10^{20} molecules, the molecular formula of the compound will be : **(2017-Gujarat)**
 (a) C_2H_4 (b) C_3H_6
 (c) C_6H_{12} (d) $\text{C}_{12}\text{H}_{24}$
- 17.** Suppose the elements X and Y combine to form two compounds XY_2 and X_3Y_2 . When 0.1 mole of XY_2 weighs 10 g and 0.05 mole of X_3Y_2 weighs 9 g, the atomic weights of X and Y are : **(2016-II)**
 (a) 20, 30 (b) 30, 20
 (c) 40, 30 (d) 60, 40
- 18.** The number of water molecules is maximum in: **(2015 Re)**
 (a) 18 moles of water
 (b) 18 molecules of water
 (c) 1.8 gram of water
 (d) 18 gram of water
- 19.** If Avogadro number N_A , is changed from $6.022 \times 10^{23} \text{ mol}^{-1}$, this would change : **(2015 Re)**
 (a) The ratio of elements to each other in a compound
 (b) The definition of mass in units of grams
 (c) The mass of one mole of carbon
 (d) The ratio of chemical species to each other in a balanced equation
- 20.** What is the mass of the precipitate formed when 50 mL of 16.9% solution of AgNO_3 is mixed with 50 mL of 5.8% NaCl solution? **(2015 Re)**
 (Ag = 107.8, N = 14, O = 16, a = 23, Cl = 35.5)
 (a) 3.5 g (b) 7 g
 (c) 14 g (d) 28 g
- 21.** 20.0 g of a magnesium carbonate sample decomposes on heating to give carbon dioxide and 8.0 g magnesium oxide. What will be the percentage purity of magnesium carbonate in the sample? (Atomic weight of Mg = 24) **(2015 Re)**
 (a) 96 (b) 60
 (c) 84 (d) 75
- 22.** When 22.4 litres of $\text{H}_2(\text{g})$ is mixed with 11.2 litres of $\text{Cl}_2(\text{g})$, each at STP, the moles of $\text{HCl}(\text{g})$ formed is equal to : **(2014)**
 (a) 2 mole of $\text{HCl}(\text{g})$
 (b) 0.5 mol of $\text{HCl}(\text{g})$
 (c) 1.2 mole of $\text{HCl}(\text{g})$
 (d) 1 mol of $\text{HCl}(\text{g})$
- 23.** 1.0 g of magnesium is burnt with 0.56 g O_2 in a closed vessel. Which reactant is left in excess and how much? **(2014)**
 (a) O_2 , 0.16 g (b) Mg, 0.44 g
 (c) O_2 , 0.28 g (d) Mg, 0.16 g
- 24.** Equal masses of H_2 , O_2 and methane have been taken in a container of volume V at temperature 27°C in identical conditions. The ratio of the volumes of gases $\text{H}_2 : \text{O}_2 : \text{methane}$ would be : **(2014)**
 (a) 8 : 16 : 1 (b) 16 : 8 : 1
 (c) 16 : 1 : 2 (d) 8 : 1 : 2
- 25.** 6.02×10^{20} molecules of urea are present in 100 mL of its solution. The concentration of solution is : **(2013)**
 (a) 0.02 M (b) 0.01 M
 (c) 0.001 M (d) 0.1 M
- 26.** An excess of AgNO_3 is added to 100 mL of a 0.01 M solution of dichlorotetraaqua-chromium (III) chloride. The number of moles of AgCl precipitated would be : **(2013)**
 (a) 0.001 (b) 0.002
 (c) 0.003 (d) 0.01