



INDIAN SCHOOL AL WADI AL KABIR



Class: XI	DEPARTMENT: SCIENCE (2026-27) SUBJECT: CHEMISTRY	Date: 17/04/2026
Worksheet No: 01 with answers	TOPIC: SOME BASIC CONCEPTS OF CHEMISTRY	Note: A4 FILE FORMAT
NAME OF THE STUDENT	CLASS & SEC:	ROLL NO.

MULTIPLE CHOICE QUESTIONS

1.	The empirical formula and molecular mass of a compound are CH_2 and 84 u respectively. What will be the molecular formula of the compound? A) C_6H_6 B) C_3H_6 C) C_6H_{12} D) C_6H_{10}	1
2.	What is the mass percentage of nitrogen in $(\text{NH}_4)_2\text{SO}_4$? A) 27.3% B) 21.2% C) 13.6% D) 10.6%	1
3.	What mass of BaCl_2 is needed to make 500 ml of a 0.100 mol L^{-1} solution? [Data: Ba = 137.3u, Cl = 35.5u] A) 41.66 g B) 20.83 g C) 10.42 g D) 8.64 g	1
4.	What is the total number of atoms in 8.8 g of carbon dioxide? A) 1.2×10^{23} B) 3.6×10^{23} C) 1.2×10^{24} D) 3.6×10^{24}	1
5.	N_xO_4 is an oxide of nitrogen. The mass percentage of oxygen is 69.57%. What is the molecular mass of this oxide? A) 92 B) 78 C) 106 D) 109	1
6.	An excess of sodium sulfate solution is added to 50 ml of a 0.100 mol L^{-1} solution of barium chloride. What is the mass of barium sulfate formed? ($\text{BaSO}_4 = 233.4\text{u}$) $\text{Na}_2\text{SO}_4 (\text{aq}) + \text{BaCl}_2 (\text{aq}) \rightarrow 2\text{NaCl}(\text{aq}) + \text{BaSO}_4 (\text{s})$ A) 23.34 g B) 2.334 g C) 11.67 g D) 1.167 g	1

7.	What is the unit of mole fraction? A) mol L^{-1} B) mol kg^{-1} C) kg L^{-1} D) No unit	1
8.	Which of the following compounds has the same empirical and molecular formulae? A) Ethane B) Ethene C) Propane D) Butane	1
9.	Assertion (A): 18g of water contains more molecules than 17g of ammonia. Reason (R): Molar mass of water is 18 gmol^{-1} but that of NH_3 is 17 gmol^{-1} A) Both assertion and reason are correct statements, and reason is the correct explanation of the assertion. B) Both assertion and reason are correct statements, but reason is not the correct explanation of the assertion. C) Assertion is correct, but reason is wrong statement. D) Assertion is wrong, but reason is correct statement.	1
10.	Assertion (A): Molarity of a solution depends on temperature. Reason (R): Mass does not change with temperature A) Both assertion and reason are correct statements, and reason is the correct explanation of the assertion. B) Both assertion and reason are correct statements, but reason is not the correct explanation of the assertion. C) Assertion is correct, but reason is wrong statement. D) Assertion is wrong, but reason is correct statement.	1

SHORT QUESTION – ANSWER TYPE:

11.	Differentiate between Molarity and Molality.	2
12.	State: a) Gay Lussac's Law of Gaseous Volumes b) Law of Definite Proportions	2
13.	Calculate the Mass % of carbon and oxygen in glucose.	2
14.	Calculate the Mole fraction of MgCl_2 in a solution which is prepared by dissolving 19 g of MgCl_2 in 176.4 g of water. ($\text{Mg} = 24 \text{ u}$, $\text{Cl} = 35.5 \text{ u}$)	2
15.	The density of 4 M solution of NaOH is 2.5 g mL^{-1} . Calculate the molality.	3
16.	Calculate the empirical formula and molecular formula of the compound with the percentage composition by mass: $\text{Li} = 17.9\%$, $\text{P} = 26.8\%$, $\text{O} = 55.3\%$. Given, Molecular mass of the compound is 115.7 u. ($\text{Li} = 6.9$, $\text{P} = 31.0$, $\text{O} = 16.0$)	3

17.	Calculate the number of atoms present in: a) 8 u of He b) 8 g of He c) 8 mol of He (He = 4u)	3
18.	$\text{CaO (s)} + 2\text{HCl (aq)} \rightarrow \text{CaCl}_2 \text{ (aq)} + \text{H}_2\text{O (l)}$. What mass of CaO is required to react completely with 50 mL of 0.8M HCl? Also calculate the mass of water produced.	3

PASSAGE BASED QUESTIONS:

19.	A solution is a homogeneous mixture composed of two or more substances, where a solute is uniformly dissolved in a solvent. It maintains a consistent composition throughout, meaning its components cannot be easily distinguished or separated by filtering. Solutions can exist as liquids, solids, or gases. Expressing the concentration of solutions involves quantitatively defining the ratio of solute to solvent or total solution, essential for chemical calculations. Key methods include molarity (mol L^{-1}), molality (mol kg^{-1}), mole fraction and mass/volume percentages. These methods determine how much solute is present in a specific amount of solvent. a) What is the mass per cent (w/w) of a solution which is prepared by dissolving 20 g of NaCl in 180 g of water? b) 200 mL of 0.8M NaOH is diluted to make 1 litre solution. Calculate the concentration of the diluted solution. c) Calculate the molarity of NaOH solution, prepared by dissolving its 10 g in enough water to form 250 mL of the solution. OR c) Calculate the mass of CaCl_2 to be dissolved in 600 g of water in order to make 1.2 m solution.	4
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LONG QUESTION – ANSWER TYPE:

20.	a) State: i) Law of Multiple Proportions ii) Avogadro Law b) Define the term ‘limiting reagent’. Identify the limiting reagent and calculate the mass of water formed when 8g of H_2 is mixed with 48 g of oxygen gas.	5
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ANSWERS

1.	C) C_6H_{12}
2.	B) 21.2%
3.	C) 10.42 g

4.	B) 3.6×10^{23}
5.	A) 92
6.	D) 1.167 g
7.	D) No unit
8.	C) Propane
9.	D) Assertion is wrong, but reason is correct statement.
10.	B) Both assertion and reason are correct statements, but reason is not the correct explanation of the assertion.
11.	Molarity (M) = $\frac{\text{No. of moles of solute}}{\text{Volume of solution in litres}}$ Molality (m) = $\frac{\text{No. of moles of solute}}{\text{Mass of solvent in kg}}$ Molarity depends on temperature but Molality doesn't.
12.	a) When gases combine or are produced in a chemical reaction they do so in a simple ratio by volume, provided all gases are at the same temperature and pressure. b) A given compound always contains exactly the same proportion of elements by mass.
13.	Mass % of carbon = 40 % Mass % of oxygen = 53.3 %
14.	Mole fraction = $\frac{n_B}{n_A + n_B}$ No. of moles of $\text{MgCl}_2 = 0.2$ No. of moles of $\text{H}_2\text{O} = 9.8$ Mole fraction of $\text{MgCl}_2 = 0.2 / 10 = 0.02$
15.	Density = 2.5 g mL^{-1} Molarity = 4 mol L^{-1} Molality = 1.7 mol kg^{-1}
16.	Empirical formula is Li_3PO_4 Molecular formula is also Li_3PO_4
17.	a) 2 b) $2 \times 6.022 \times 10^{23} = 1.2044 \times 10^{24}$ c) $8 \times 6.022 \times 10^{23} = 4.8176 \times 10^{24}$
18.	No. of moles of $\text{HCl} = 0.04 \text{ mol}$ No. of moles of $\text{CaO} = 0.02 \text{ mol}$ Mass of $\text{CaO} = 0.02 \times 56 = 1.12 \text{ g}$ Mass of $\text{H}_2\text{O} = 0.02 \times 18 = 0.36 \text{ g}$

19.	a) $\text{Mass per cent} = \frac{\text{Mass of solute}}{\text{Mass of solution}} \times 100$ $= 10 \%$ b) $M_1V_1 = M_2V_2$ $0.8 \times 0.2 = M_2 \times 1$ $M_2 = 0.16 \text{ M}$ c) $\text{Molarity (M)} = \frac{\text{No. of moles of solute}}{\text{Volume of solution in litres}}$ $= \frac{0.25}{0.25}$ $= 1 \text{ mol L}^{-1}$ OR c) $\text{Molality (m)} = \frac{\text{No. of moles of solute}}{\text{Mass of solvent in kg}}$ $1.2 = \frac{\text{No. of moles of solute}}{0.6 \text{ kg}}$ No. of moles of solute = 0.72 mol Mass of CaCl_2 = 0.72×111 $= 79.92 \text{ g}$
20.	a) i) If two elements can combine to form more than one compound, the masses of one element that combines with a fixed mass of the other element, are in the ratio of small whole numbers. ii) Equal volumes of gases at same temperature and pressure should contain equal number of molecules. b) The reactant which is completely consumed during the reaction and limits the amount of product formed in a chemical reaction is called limiting reagent. Limiting reagent is O_2 Mass of H_2O = $3 \times 18 = 54 \text{ g}$

Prepared by:
Mr Anoop Stephen

Checked by:
HOD Science