

Chemistry | Test | Grade XI  
Some Basic Concepts of Chemistry

Time: 1hr

M.M:30

1. Choose the correct option:

1 x 5 = 5

- a. 16 g of oxygen has the same number of molecules as in  
(a) 16 g of CO  
(b) 28 g of N<sub>2</sub>  
(c) 14g of N<sub>2</sub>  
(d) 1.0g of H<sub>2</sub>
- b. Which of the following terms are unitless?  
(a) Molality  
(b) Molarity  
(c) Mole fraction  
(d) Mass per cent
- c. Which of the following solutions have the same concentration?  
(a) 20 g of NaOH in 200 mL of solution  
(b) 0.5 mol of KCl in 200 mL of solution  
(c) 40 g of NaOH in 100 mL of solution  
(d) 20 g of KOH in 200 mL of solution
- d. If the density of a solution is 3.12 g mL<sup>-1</sup>, the mass of 1.5 mL solution in significant figures is \_\_\_\_\_  
(a) 4.7 g  
(b) 4680 x 10<sup>-3</sup> g  
(c) 4.680 g  
(d) 46.80 g
- e. The empirical formula and molecular mass of a compound are CH<sub>2</sub>O and 180g respectively. What will be the molecular formula of the compound?  
(a) C<sub>9</sub>H<sub>18</sub>O<sub>9</sub>  
(b) CH<sub>2</sub>O  
(c) C<sub>6</sub>H<sub>12</sub>O<sub>6</sub>  
(d) C<sub>2</sub>H<sub>4</sub>O<sub>2</sub>

2. Nitrogen has three occurring isotopes: Nitrogen-13, Nitrogen-14, Nitrogen-15. Which isotope is the most abundant?

3. An element has two naturally occurring isotopes. One is 10.013 amu and is 19.9% abundant. The other is 11.01 amu and is 80.1% abundant. What is the average atomic mass? What element is it? 2

4. If 4 g of NaOH dissolves in 36 g of H<sub>2</sub>O, calculate the mole fraction of each component in solution. Also, determine the molarity of solution (specific gravity of solution is 1 g mL<sup>-1</sup>). 2

5. Assertion (A): Combustion of 16 g of methane gives 18 g of water. 2  
Reason (R): In the combustion of methane, water is one of the product.

- (a) Both A and R are true but R is not the correct explanation of A.
- (b) A is true but R is false
- (c) A is false but R is true.
- (d) Both A and R are false.

6. Define the law of multiple proportions. Explain it with two examples. How does this law point to the existence of atoms? 3

7. Calcium carbonate reacts with aqueous HCl to give CaCl<sub>2</sub> and CO<sub>2</sub> according to the reaction given below: 2 + 1 + 2 = 5



- a. What mass of CaCl<sub>2</sub> will be formed when 250 mL of 0.76 M HCl reacts with 1000 g of CaCO<sub>3</sub>?
- b. Name the limiting reagent.
- c. Calculate the number of moles of CaCl<sub>2</sub> formed in the reaction.

8. The empirical formula and molecular mass of a compound are CH<sub>2</sub>O and 180g respectively. What will be the molecular formula of the compound? 2

9. Calculate the mass per cent of calcium, phosphorus and oxygen in calcium phosphate Ca<sub>3</sub>(PO<sub>4</sub>)<sub>2</sub> 2

10. The reactant which is entirely consumed in reaction is known as limiting reagent. In the reaction 2A + 4B → 3C + 4D, when 5 moles of A react with 6 moles of B, then 2 x 2 = 4

- a. which is the limiting reagent?
- b. calculate the amount of C formed.

11. Assertion (A): Significant figures for 0.200 is 3 whereas for 200 it is 1. 2  
Reason (R): Zero at the end or right of a number are significant provided they are not on the right side of the decimal point.

- (a) Both A and R are true and R is correct explanation of A.
- (b) Both A and R are true but R is not the correct explanation of A.
- (c) A is true but R is false.
- (d) Both A and R are false.