

**HOLIDAYS HOMEWORK**  
**CLASS XI**

**SUMMER BREAK 2018-19**  
**SUBJECT- CHEMISTRY**

**CHAPTER-I**

1. a) NO and NO<sub>2</sub> are two oxides of nitrogen.
  - i) Which law of chemical combination is illustrated by these compounds? (1)
  - ii) State the law. (1)
2. Calculate the mass of a magnesium atom in grams. (1)
3. What is molality? (1)
4. Determine the number of moles present in 0.55 mg of electrons.(1)
5. Give the empirical formula of the following. C<sub>6</sub>H<sub>12</sub>O<sub>6</sub>, C<sub>6</sub>H<sub>6</sub>, CH<sub>3</sub>COOH, C<sub>6</sub>H<sub>6</sub>Cl<sub>6</sub> (2)
6. Two elements, carbon and hydrogen combine to form C<sub>2</sub>H<sub>6</sub>, C<sub>2</sub>H<sub>4</sub> and C<sub>2</sub>H<sub>2</sub>. Identify the law illustrated here. (1)
7. Empirical formula represents the simplest whole number ratio of various atoms present in a compound. a) Give the relation between empirical formula and molecular formula. (1)
8. An organic compound has the following percentage composition C = 12.36%, H = 2.13%, Br = 85%. Its vapour density is 94. Find its molecular formula. (2)
9. What is mole fraction? (1)
10. When nitrogen and hydrogen combines to form ammonia, the ratio between the volumes of gaseous reactants and products is 1: 3: 2. Name the law of chemical combination illustrated here. (1)
11. A compound is made up of two elements A and B, has A = 70% and B = 30%. The relative number of moles of A and B in the compound are 1.25 and 1.88 respectively. If the molar mass of the compound is 160, find the molecular formula of the compound. (3)
12. 12 g of C contains Avogadro's number of carbon atoms.
13. Give the Avogadro's number. (1)
14. The mass of 2 moles of ammonia gas is ..... (i) 2 g (ii) 1.2 x 10<sup>22</sup>g (iii) 17 g (iv) 34g (1)
15. Calculate the volume of ammonia gas produced at STP when 140 g of nitrogen gas reacts with 30 g of hydrogen gas. (Atomic mass: N = 14u, H = 1 u) (2)
16. A given compound always contains exactly the same proportion of elements by weight.
  - (i) Name the above law. (1)
  - (ii) Write the name of the Scientist who proposed this law. (1)
17. Calculate the number of molecules in each of the following: i) 1 g N<sub>2</sub> ii) 1 g CO<sub>2</sub> (Given that N<sub>A</sub> is 6.022 x 10<sup>23</sup>, molecular mass of N<sub>2</sub> = 28 and CO<sub>2</sub> = 44) (2)

18. Hydrogen combines with oxygen to form two different compounds, namely water ( $\text{H}_2\text{O}$ ) and hydrogen peroxide ( $\text{H}_2\text{O}_2$ ). a) Which law is obeyed by this combination? (1) b) State the law. (2)
19. How many significant figures are present in the following? i) 0.0025 ii) 285 (1)
20. a) How many moles of dioxygen are present in 64g of dioxygen? (Molar mass of dioxygen is 32).
21. The following data were obtained when dinitrogen ( $\text{N}_2$ ) and dioxygen ( $\text{O}_2$ ) react together to form different compounds. Mass of  $\text{N}_2$  and Mass of  $\text{O}_2$  14 g 16 g, 14 g 32 g, 28 g 32 g and 28 g 80 g. Name the law of chemical combination obeyed by the above experimental data. (1)
22. Define empirical formula. How is it related to the molecular formula of a compound? (2)
23. What is atomic mass unit (amu)? (1) b) In a reaction  $\text{A} + \text{B}_2 \rightarrow \text{AB}_2$ , identify the limiting reagent in the reaction mixture containing 5mol A and 2.5mol B. (1)
24. Calculate the mass of NaOH required to make 500 ml of 0.5M aqueous solution. (Molar mass of NaOH = 40) (2)
25. The mole concept helps in handling a large number of atoms and molecules in stoichiometric calculations. a) Define 1 mol. (1) b) What is the number of hydrogen atoms in 1 mole of methane ( $\text{CH}_4$ )? (1)
26. Calculate the amount of carbon dioxide formed by the complete combustion of 80g of methane as per the reaction:  $\text{CH}_4(\text{g}) + 2\text{O}_2(\text{g}) \rightarrow \text{CO}_2(\text{g}) + 2\text{H}_2\text{O}(\text{g})$  (Atomic mass of C = 12.01u, H = 1.008u, O = 16u) (2)
27. An organic compound on analysis gave the following composition. Carbon = 40%, Hydrogen = 6.66% and oxygen = 53.34%. Calculate its molecular formula if its molecular mass is 90. (2)
28. The combination of elements to form compounds is governed by the laws of chemical combination. a. Hydrogen combines with oxygen to form compounds, namely water and hydrogen peroxide. State and illustrate the related law of chemical combination. (2)
29. What is meant by limiting reagent in a chemical reaction? (1)
30. 28 g of nitrogen is mixed with 12 g of hydrogen to form ammonia as per the reaction,  $\text{N}_2 + 3\text{H}_2 \rightarrow 2\text{NH}_3$ .  
Which is the limiting reagent in this reaction? (1)
31. The laws of chemical combination govern the formation of compounds from elements. a) State the law of conservation of mass. Who put forward this law? (1½)
32. The laws of chemical combination are the basis of the atomic theory. a) Name the law of chemical combination illustrated by the pair of compounds, CO and  $\text{CO}_2$ . (1) b) State and explain the law of conservation of mass. (1½)
33. Calculate the molarity of a solution containing 8 g of NaOH in 500 mL of water. (1½)
34. One mole is the amount of substance that contains as many particles as 12 g of C-12 isotope of carbon.
35. What do you mean by molar mass of a compound? (1)

36. Calculate the number of moles in 1 L of water (Density of water 1 g/mL). Also calculate the number of water molecules in 1 L water. (3)
37. A compound contains 4.07% hydrogen, 24.27% carbon and 71.65% chlorine. Its molecular mass is 98.96. What are the empirical and molecular formulae? (3)
38. Calculate the number of moles of oxygen required to produce 240 g of MgO by burning Mg metal. (Atomic mass Mg = 24, O = 16) (4)
39. a) Find the number of oxygen atoms in 4 g of O<sub>2</sub>. (1) b) Which is heavier, one oxygen atom or 10 hydrogen atoms? (1)

## CHAPTER-II

- do question no. 2.1 and 2.2 on page no. 33
- do question no. 2.3, 2.4, 2.5 on page no. 35 and 36
- do question no. 2.6, 2.7, 2.8 and 2.9 on page no. 39 and 40
- do question no. 2.10 and 2.11 on page no. 45
- do question no. 2.12, 2.13 and 2.14 on page no. 46
- do question no. 2.15 and 2.16 on page no. 48
- do question no. 2.17 and 2.18 on page no. 53
- do question no. 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, 2.8, 2.9, 2.11, 2.13, 2.15, 2.16, 2.20, 2.21, 2.22, 2.24, 2.25, 2.26, 2.27, 2.28, 2.29, 2.30, 2.31, 2.41, 2.42, 2.43, 2.44, 2.62, 2.63, 2.64, 2.65, 2.66, 2.67 of page no 67, 68 and 69.