DPP : CHEMISTRY – BASIC CONCEPTS

1. Calculate the molar mass of the following substances.
(a) Ethyne, C_2H_2
(b) Sulphur molecule, S_8
(c) Phosphorus molecule, P_4 (Atomic mass of phosphorus = 31)
(d) Hydrochloric acid, HCl
(e) Nitric acid, HNO_3

2. Find number of moles of H_2 in 10g of H_2

3. How many moles is 12.044×10^{23} atoms of He.

4. How many moles are there in 52g of Helium?

5. Calculate the Molar Mass of Calcium Carbonate ($CaCO_3$).

6. What is the mass of—
(a) 1 mole of nitrogen atoms?
(b) 4 moles of aluminum atoms (Atomic mass of aluminum = 27)?
(c) 10 moles of sodium sulphite (Na_2SO_3)?

7. Convert into mole.
(a) 12 g of oxygen gas
(b) 20 g of water
(c) 22 g of carbon dioxide.

8. What is the mass of:
(a) 0.2 mole of oxygen atoms?
(b) 0.5 mole of water molecules?

9. Calculate the number of molecules of sulphur (S_8) present in 16 g of solid sulphur.

10. 3.42 g of sucrose are dissolved in 18 g of water in a beaker. The number of oxygen atoms in the solution are
(a) 6.68×10^{23} (b) 6.09×10^{22}
(c) 6.022×10^{23} (d) 6.022×10^{21}

11. If one mole of carbon atoms weighs 12 grams, what is the mass (in grams) of 1 atom of carbon?

12. If 1.4g of Calcium Oxide is formed by the complete decomposition of Calcium Carbonate, then the amount of Calcium Carbonate taken and the amount of Carbon Dioxide formed will be respectively?

13. Which of the following correctly represents 360 g of water?
(a) 2 moles of H_2O
(b) 20 moles of water
(c) 6.022×10^{23} molecules of water
(d) 1.2044×10^{25} molecules of water

14. Which of the following pairs have the same number of atoms?
(a) 16 g of $O_2(g)$ and 4 g of $H_2(g)$
(b) 16 g of O_2 and 44 g of H_2
(c) 28 g of N_2 and 32 g of O_2
(d) 12 g of C(s) and 23 g of Na(s)

15. Which of the following contains the greatest number of atoms?
(a) 1g of butane (b) 1g of Nitrogen
(c) 1g of silver (d) 1g of water

16. Which sample contains the largest number of atoms?
(a) 1mg of C_4H_{10} (b) 1mg of N_2
(c) 1mg of Na (d) 1ml of H_2O

17. How many moles of Magnesium Phosphate ($Mg_3(PO_4)_2$) will contain 0.25 mole of oxygen atoms?
(a) 3.125×10^{-2} (b) 1.25×10^{-2}
(c) 2.5×10^{-2} (d) 2×10^{-2}

18. Which has the maximum number of molecules?
(a) 7g N_2 (b) 2g H_2
(c) 16g NO_2 (d) 16g O_2

19. How many gram atoms of H and S are contained in 0.40 mole of H_2S?

20. Which has more number of atoms, 100 grams of sodium or 100 grams of iron (given, atomic mass of Na = 23 u, Fe = 56 u)?

21. Calculate the number of moles and molecules in 22g of Acetic Acid.

22. 24 g of Carbon reacts with some Oxygen to make 88g of Carbon Dioxide. Find out the amount of Oxygen used.

23. In 2 moles of acetaldehyde (CH_3CHO) calculate the following
(a) Number of moles of C
(b) Number of moles of H
(c) Number of moles of O
(d) Number of molecules of CH_3CHO

24. Calculate the number of aluminum ions present in 0.051 g of aluminum oxide. (Hint: The mass of an ion is the same as that of an atom of the same element. Atomic mass of Al = 27 u)