DPP No: 03

SYLLABUS : Mole Concept

1.	Which of the following has the maximum mass ?								
	(A) 1 gram-atom of C	2	(B) $\frac{1}{2}$ mole of CH ₄						
	(C) 10 mL of water		(D) 3.011 × 10 ²³ atoms of oxygen						
2.	The approximate number of molecules of CO_2 present in 44 g of CO_2 is :								
	(A) 6.0×10^{23}	(B) 3×10 ²³	(C) 12×10^{23}	(D) 3×10 ¹⁰					
3.	The weight of a molecule of the compound $C_{_{60}}H_{_{22}}$ is :								
	(A) 1.09 × 10 ⁻²¹ g	(B) 1.23 × 10 ⁻²¹ g	(C) 5.025 × 10 ⁻²³ g	(D) 16.023 × 10 ⁻²³ g					
4.	A sample of ammonium phosphate $(NH_4)_3PO_4$ contains 3.18 mole of H atoms. The number of mole of O atoms in the sample is :								
	(A) 0.265	(B) 0.795	(C) 1.06	(D) 3.18					
5.	The value of R in SI unit is :								
	(A) 8.314 × 10 ⁻⁷ erg	K⁻¹ mol⁻¹	(B) 8.314 JK ⁻¹ mol ⁻¹						
	(C) 0.0823 litre atm k	K⁻¹ mol⁻¹	(D) 2 cal K⁻¹ mol⁻¹						
6.	16 g of an ideal gas SO _x occupies 5.6 L. at STP. The value of x is								
	(A) x = 3	(B) x = 2	(C) x = 4	(D) none of these					
7.	If 1.5 moles of oxygen combine with AI to form AI_2O_3 , the weight of AI used in the reaction is								
	(A) 27 g	(B) 40.5 g	(C) 54g	(D) 81 g					
8.	How many liters of CO ₂ at STP will be formed when 0.01 mol of H_2SO_4 reacts with excess Na ₂ CO ₃ .								
	$Na_2CO_3 + H_2SO_4 \longrightarrow Na_2SO_4 + CO_2 + H_2O_4$								
	(A) 22.4 L	(B) 2.24 L	(C) 0.224 L	(D) 1.12 L					
9.	How many moles of N.T.P.	low many moles of potassium chlorate need to be heated to produce 11.2 litre oxygen I.T.P.							
	(A) $\frac{1}{2}$ mol	(B) $\frac{1}{3}$ mol	(C) $\frac{1}{4}$ mol	(D) $\frac{2}{3}$ mol					

10. Calculate the amount of Ni needed in the Mond's process given below

Ni + 4CO \longrightarrow Ni(CO),

If CO used in this process is obtained through a process, in which 6 g of carbon is mixed with 44 g CO₂. (Ni = 59 u)

- (A) 14.675 g (B) 29 g (C) 58 g (D) 28 g
- **11.** Carbon reacts with chlorine to form CCl_4 . 36 gm of carbon was mixed with 142 g of Cl_2 . Calculate mass of CCl_4 produced and the remaining mass of reactant.

(A) $w_c = 24 \text{ gm}$; $w_{CCl_4} = 154 \text{ gm}$ (B) $w_c = 21 \text{ gm}$; $w_{CCl_4} = 145 \text{ gm}$

(C) $w_c = 14 \text{ gm}$; $w_{CCl_4} = 164 \text{ gm}$ (D) None

12. How many mole of Zn(FeS₂) can be made from 2 mole zinc, 3 mole iron and 5 mole sulphur.

(A) 2 mole	(B) 3 mole	(C) 4 mole	(D) 5 mole
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13. For the reaction : $A + 2B \rightarrow C$; 5 mole of A and 8 mole of B will produce -

- **14.** Equal weight of 'X' (At. wt. = 36) and 'Y' (At. wt. = 24) are reacted to form the compound X_2Y_3 . Then :
 - (A) X is the limiting reagent
 - (B) Y is the limiting reagent
 - (C) No reactant is left over and mass of X_2Y_3 formed is double the mass of 'X' taken
 - (D) none of these
- **15.** 0.5 mole of H_2SO_4 is mixed with 0.2 mole of Ca (OH)₂. The maximum number of moles of CaSO₄ formed is
 - (A) 0.2 (B) 0.5 (C) 0.4 (D) 1.5
- **16.** How many moles of magnesium phosphate, $Mg_3(PO_4)_2$ will contain 0.25 mole of oxygen atoms?

(A) 0.02 (B) 3.125×10^{-2} (C) 1.25×10^{-2} (D) 2.5×10^{-2}

17. Density of a 2.05M solution of acetic acid in water is 1.02 g/ml. The molality of the solution is : (A) 1.14 mol kg⁻¹ (B) 3.28 mol kg⁻¹ (C) 2.28 mol kg⁻¹ (D) 0.44 mol kg⁻¹

- **18.** If the atomic mass of Sodium is 23 u, the number of moles in 46 g of sodium is :
- **19.** The value of gas constant R in calorie per degree temperature per mol is approximately :
- **20.** How many atoms are there in 100 amu of He ?
- **21.** Calculate the weight of 12.044×10^{23} atoms of carbon.
- **22.** In a gaseous mixture 2mol of CO_2 , 1 mol of H_2 and 2 mol of He are present than determine mole percentage of CO_2 .

- 23. 12 g of alkaline earth metal gives 14.8 g of its nitride. Atomic weight of metal is -
- 24. Calculate the weight of iron which will be converted into its oxide by the action of 18g of steam.

Unbalanced reaction : Fe + $H_2O \longrightarrow Fe_3O_4 + H_2$.

25. The mass of 70% H_2SO_4 required for neutralisation of 1 mol of NaOH.

						ANSW	/ER KE	Y					
1.	(A)	2.	(A)	3.	(B)	4.	(C)	5.	(B)	6.	(B)	7.	(C)
8. 15.	(C) (A)	9. 16.	(B) (B)	10. 17.	(A) (C)	11. 18.	(A) (2)	12. 19.	(A) (2)	13. 20.	(B) 25	14. 21.	(C) (24g)
22.	% $CO_2 = \frac{2}{2+1+2} \times 100 = 40\%$.				23.	(40)	24.	(42)	25.	(70)			