DPP # 11

M.M. : 35 **MAX. TIME : 20 Min.**

ONLY ONE OPTION CORRECT TYPE

1. A drug marijuna owes its activity to tetrahydrocarbinol, which contains 70% as many C atoms as H atoms and 15 times as many hydrogen atoms as oxygen atoms. The number of mole of compound in a gm of it is 0.00318. The molecular formula will be **[3]**

(A) $C_{20}H_{30}O_2$ (B) $C_{21}H_{30}O_2$ (C) $C_{12}H_{20}O_2$ (D) $C_{12}H_{20}O_3$

2. 5 moles of A, 6 moles of Z are mixed with sufficient amount of C to produce final product 'F'. Then find the maximum moles of 'F' which can be produced. Assuming that the product formed can also be reused. Reactions are : **[3]**

$$A + 2\,Z \longrightarrow B$$
$$B + C \longrightarrow Z + F$$

(A) 3 moles (B) 4.5 moles (C) 5 moles (D) 6 moles

3. 1.44 gram of Titanium (Ti) reacted with excess of O_2 and produced x gram of non-stoichiometric compound $Ti_{1.44}O$. The value of x will be [Ti = 48] **[3]**

(A) 2.77 g (B) 3.77 g (C) 1.77 g (D) 3.0 g

4. Ferric oxide can be obtained by oxidation of FeO : **[3]**

$$4FeO + O_2 \longrightarrow 2Fe_2O_3$$

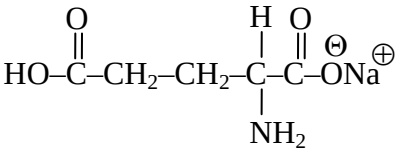
The O_2 gas required can be prepared by the following reaction.

$$2SO_3 \longrightarrow 2SO_2 + O_2(g)$$

What is the maximum amount of Fe_2O_3 can be produced by 144 g FeO and 160 g SO_3.
[Atomic mass of Fe = 56]

(A) 0.320 g (B) 80 g (C) 120 g (D) 160 g

5. Monosodium glutamate (MSG) is salt of one of the most abundant naturally occuring non-essential amino acid which is commonly used in food products like in "MAGGI" having structural formula as : **[3]**



Mass % of Na in MSG is-

(A) 14.8 (B) 15.1 (C) 13.6 (D) 16.5

ONE OR MORE THAN ONE OPTION CORRECT TYPE

6. Which of the following option(s) is heavier than 1gm-molecule oxygen- **[3]**

(A) 12 gm of O_3 (B) 1 gm-molecule O_3
(C) 4 gm-atom of hydrogen (D) 1.12 litre of H_2O at 4°C and 1 atm

INTEGER/SUBJECTIVE TYPE

7. Mr. Gupta has lost the secret code of his bag which consists of lots of chocolates. From the information given below help Mr. Gupta to recall his code. The code consists of five digits a b c d. Fill in the number in the bubbles provided. **[2 + 2 + 2 + 2 = 8]**

(a) = represents moles of hydrogen gas formed by converting all the hydrogen in 6 moles of NH_3

(b) = $\frac{\text{density of } SO_2 \text{ gas at some T \& P}}{\text{density of } O_2 \text{ gas at same T \& P}}$

(c) = % by moles of NH_3 in a mixture of NH_3 & H_2S having an average molecular weight of 33.15.

(d) = represents % yield of reaction if 16.8 *l* of O_2 is produced at 1 atm & 273 K from 122.5 gm of $KClO_3$.

8. Calculate the percentage loss in the mass, when 2.02×10^2 gm KNO_3 is completely decomposed by heating into $KNO_2(s)$ & O_2 (g) **[3]**

$$KNO_3(s) \longrightarrow KNO_2(s) + O_2\ (g)$$

9. Calculate the amount of ZnO produced (in gm) when 195 gm of ZnS reacts with 89.6 *l* O_2 at 1 atm and 273 K. [Zn = 65.5] **[3]**

$$ZnS + O_2 \longrightarrow ZnO + SO_2$$

10. 62.5 gm of a mixture of $CaCO_3$ and SiO_2 are treated with excess of HCl and 1.1 gm of CO_2 is produced. What is mass % $CaCO_3$ in the mixture. **[3]**