RACE # 06 PHYSICAL CHEMISTRY

MAX. TIME : 20 Min.

Single correct :

1. A plant virus contains spherical particles of diameter 4Å. If the density of virus is $\frac{12}{\pi}$ gm/cm^3, the molar mass of virus is -
(A) 76.8 gm/mol (B) 9.6 gm/mol (C) 614.4 gm/mol (D) 128 gm/ mol

2. Certain mass of starch, $(C_6H_{10}O_5)_n$, is burnt completely. If 26.4 kg CO_2 is produced, the mass of water produced simultaneously is -
(A) 9.0 gm (B) 18.0 kg (C) 9.0 kg (D) 27.0 kg

3. Each molecules of a compound contains 5 carbon atoms, 8 hydrogen atoms and 4×10^{-23} gm of other elements. The molecular mass of compounds is ($N_A = 6 \times 10^{23}$)
(A) 92 (B) 68 (C) 308 (D) 108

4. Calculate the mass of HCl (in gm) produced if 2gm H_2 is mixed with 71 gm Cl_2.

$$H_2 + Cl_2 \longrightarrow 2HCl$$

(A) 35.5 (B) 72 (C) 36.5 (D) 73

5. For the reaction: $7A + 13B + 15C \longrightarrow 17P$
If 15 moles of A, 26 moles of B & 30.5 moles of C are taken initially then liniting reactant is–
(A) A (B) B (C) C (D) None of these

Matrix type :

6. Match the column :

Column-I (Reaction)	**Column-II (At the end)**
(A) $\underset{4\,mol}{2A} + \underset{6\,mol}{2B} \xrightarrow{50\%\,yield} 3C$	(P) 3 moles C formed
(B) $\underset{4\,mol}{\frac{1}{2}A} + \underset{8\,mol}{2B} \xrightarrow{80\%\,yield} C$	(Q) 3.2 moles C formed
(C) $\underset{15\,mol}{3A} + \underset{20\,mol}{2B} \xrightarrow{60\%\,yield} C$	(R) A is limiting reagent
(D) $\underset{5\,mol}{A} + \underset{12\,mol}{3B} \xrightarrow{20\%\,yield} 2C$	(S) B is limiting reagent
	(T) 1.6 moles C formed

Subjective :

7. A person produce 2.5 L gastric juice per day, which contains 3.65 gm HCl per litre. The minimum integer number of antacid tablets, each containing 870 mg $Mg(OH)_2$, which should be taken by that person to neutralise all HCl produce in one day, is : [Mg = 24]

8. P & Q are two elements which form P_2Q_3 and PQ_2 molecules. If 0.15 mole each of P_2Q_3 and PQ_2 weighs 15.9 gm and 9.3 gm respectively. Calculate the atomic weights of P and Q.

9. An element X is found to combine with oxygen to form X_4O_6. If 8.4 gm of this element combines with 6.4 gm of oxygen, then calculate the atomic weight of X.

10. Moles of glucose, which produce a total of 744 gm CO_2 and water on complete combustion, is :