Section D (Assertion–Reason)

The following questions consist of two statements. Mark

(a) If both statements are CORRECT, and **Statement II** is the CORRECT explanation of **Statement I**.

(b) If both statements are CORRECT, and **Statement II** is NOT the CORRECT explanation of **Statement I**.

(c) If **Statement I** is CORRECT, but **Statement II** is INCORRECT.

(d) If **Statement I** is INCORRECT, but **Statement II** is CORRECT.

1. **Statement I:** The molecular mass of any substance is the sum of atomic masses of all the atoms present in each molecule of the substance.

   Statement II: The atomic as well as molecular masses are defined on the same carbon scale.

2. **Statement I:** The number of atoms in a given mass of dioxygen (oxygen) and trioxygen (ozone) gases is same.

   Statement II: The number of atoms depends on atomic mass, not on molecular mass.

3. **Statement I:** During a chemical reaction, the total moles remain constant.

   Statement II: During a chemical reaction, the total mass remains constant.

4. **Statement I:** For reaction:

   $2A(g) + 3B(g) \rightarrow 4C(g) + D(g)$,

   the vapour density remains constant throughout the progress of reaction.

   Statement II: In all the gaseous chemical reactions, the vapour density remains constant.

5. **Statement I:** When any hydrocarbon is burnt, the moles of oxygen needed for complete combustion is always greater than the moles of hydrocarbon burnt.

   Statement II: Complete combustion of any substance requires more moles of oxygen than the moles of substance burnt.

6. **Statement I:** When 7.0 g nitrogen and 3.0 g hydrogen are allowed to react to form ammonia as a single product, 10.0 g ammonia is formed.

   Statement II: Chemical reactions follow the law of conservation of mass.

7. **Statement I:** The percentage yield of any product may be increased to more than 100% by adding more and more reactants to the reaction mixture.

   Statement II: Greater amount of reactants may result the production of greater amount of products.

8. **Statement I:** The mass ratio of reactants remains unchanged during the reaction, if they are taken in their stoichiometric amounts.

   Statement II: The mass ratio of products formed (in case of more than one products), is always independent from the relative masses of reactants taken.

9. **Statement I:** For the maximum yield of ammonia, the total amount of mixture of N_2 and H_2 should be taken in 1:3 mole ratio.

   Statement II: The yield of product becomes maximum when the reactants are taken in their stoichiometric amounts.

10. **Statement I:** Volumes of non-reacting gases are always additive.

    Statement II: Gases do not have their own volume.

11. **Statement I:** When a hydrocarbon is burnt and the products of combustion are cooled to the original temperature and pressure, a contraction in volume occurs.