

MHT CET 2026 Mathematics Answer key PDF

Chemistry

1. Option (2) BrF_3

Explanation:

Under standard conditions, ClF and ClF_3 exist as gases, while IF_3 is an unstable solid. BrF_3 is a stable liquid at 25°C due to its higher molecular weight and stronger polar intermolecular attractions.

2. Option (2) 120 g mol^{-1}

Explanation:

The formula for osmotic pressure is $\pi = \frac{wRT}{M_w V}$. Substituting the given values yields $0.82 = \frac{2 \times 0.082 \times 300}{M_w \times 0.5}$, which simplifies directly to give $M_w = 120 \text{ g mol}^{-1}$.

3. Option (3) +6

Explanation:

Marshall's acid ($\text{H}_2\text{S}_2\text{O}_8$) contains a peroxide bridge ($\text{O}-\text{O}$). Setting up the neutral oxidation sum with two peroxide oxygens yields $2(+1) + 2x + 6(-2) + 2(-1) = 0 \Rightarrow x = +6$.

4. Option (1) Primary amine

Explanation:

Mendius reduction of an alkyl cyanide ($R-\text{C} \equiv \text{N}$) using sodium in ether reduces the carbon-nitrogen triple bond by adding hydrogen atoms, yielding a primary amine ($R-\text{CH}_2\text{NH}_2$).

5. Option (2) HCl

Explanation:

An amphoteric substance is capable of acting as both an acid and a base. Since hydrochloric acid (HCl) is a strong mineral acid, it strictly donates protons and lacks any ability to accept them.

6. Option (1) 0.05

Explanation:

For a second-order reaction, $\text{Rate} = k[\text{A}]^2$. Substituting the given values gives $1.25 \times 10^{-2} = k(0.5)^2 \Rightarrow 1.25 \times 10^{-2} = 0.25k \Rightarrow k = 0.05$.

7. Option (2) s^{-1}

Explanation:

The general unit of the rate constant is $(\text{mol dm}^{-3})^{1-n} \text{ s}^{-1}$. For a first-order reaction ($n = 1$), this dimensional formula simplifies directly to reciprocal seconds (s^{-1}).

8. Option (3) 3

Explanation:

The spin-only magnetic moment is given by $\mu = \sqrt{n(n+2)} \text{ BM}$. For Cr^{3+} (which has a $3d^3$ configuration), substituting $n = 3$ unpaired electrons yields $\mu = \sqrt{15} \approx 3.87 \text{ BM}$.

9. Option (2) Methyl salicylate

Explanation:

Oil of wintergreen is an organic ester naturally synthesized by many species of plants, and its chemical IUPAC-associated common name is methyl salicylate.

10. **Option (4) Chlorine**

Explanation:

Group 16 elements (the chalcogens) include oxygen, sulfur, selenium, tellurium, and polonium. Chlorine belongs to the halogens located in Group 17 of the periodic table.

