

**CHEMISTRY ANSWER KEY 2025
PLUS ONE BOARD EXAM 2025**

Answers for Qns 1-15

1. **Limiting reagent in the reaction $2A+4B\rightarrow 3C+4D$ when 5 moles of A react with 6 moles of B:**

- **Answer:** B is the limiting reagent.
- **Explanation:** For 5 moles of A, 10 moles of B are required (since the ratio is 2:4). Only 6 moles of B are available, so B is the limiting reagent.

2. **Element that will gain one electron more readily:**

- **Answer:** (d) Cl(g)
- **Explanation:** Chlorine (Cl) has the highest electron affinity among the given elements, making it more likely to gain an electron.

3. **Analyse the statements:**

- **Answer:** (a) Both statement I and statement II are true, and statement II is the correct explanation of statement I.
- **Explanation:** Sodium chloride is stable because both sodium and chloride ions achieve an octet in the formation of NaCl.

4. **Conjugate base of H_2O**

- **Answer:** OH^-
- **Explanation:** When H_2O loses a proton (H^+), it forms OH^- , which is its conjugate base.

5. **Number of σ bonds in $HC\equiv CCH=CHCH_3$:**

- **Answer:** 10 σ bonds.
- **Explanation:** The molecule has 10 single bonds, each of which is a σ bond.

Questions 6 to 15 (Each carries 2 scores)

6. **Law of Multiple Proportions:**

- **Answer:** The law states that when two elements combine to form more than one compound, the masses of one element that combine with a fixed mass of the other element are in a ratio of small whole numbers.
- **Example:** Carbon and oxygen form CO and CO_2 . In CO, 12g of C combines with 16g of O. In CO_2 , 12g of C combines with 32g of O. The ratio of oxygen masses is 16:32 or 1:2.

7. **Wavelength of the electromagnetic wave:**

- **Answer:** The wavelength is 8.64 pm (2.16×10^{-4}) (picometers).

8. **Boundary surface diagram of s and p orbitals:**

- **Answer:**
 - **s orbital:** Spherical shape.
 - **p orbital:** Dumbbell shape with two lobes.

9. **Match the following:**

- **Answer:**
 - (i) $\text{CH}_4 \rightarrow$ (c) sp^3
 - (ii) $\text{PCl}_5 \rightarrow$ (a) sp^3d
 - (iii) $\text{BeF}_2 \rightarrow$ (e) sp
 - (iv) $\text{SF}_6 \rightarrow$ (b) sp^3d^2

10. **State functions and path functions:**

- **Answer:**
 - **State functions:** Enthalpy, free energy.
 - **Path functions:** Heat, work.

11. **Buffer solutions:**

- **Answer:** Buffer solutions resist changes in pH when small amounts of acid or base are added.
- **Example:** A mixture of acetic acid (CH_3COOH) and sodium acetate (CH_3COONa).

12. **Increasing order of oxidation number of chlorine:**

- **Answer:** Cl_2 (0) < NaClO (+1) < KClO_2 (+3) < ClO_2 (+4).

13. **IUPAC names and type of isomerism:**

- **Answer:**
 - (i) CH_3COCH_3 : **Propanone** (Ketone), no isomerism.
 - (ii) $\text{CH}_3\text{CH}_2\text{CHO}$: **Propanal** (Aldehyde), no isomerism.

14. **Products of propene ozonolysis:**

- **Answer:** Formaldehyde (HCHO) and Acetaldehyde (CH_3CHO).

15. **Complete the reactions:**

- **Answer:**
 - (i) : Hydrogenation reaction, forms an alkane.
 - (ii) : Chlorination reaction, forms a chloroalkane.

