



General Instructions

- (i) **Duration:** The total duration of the examination is 3 hours (180 minutes).
- (ii) **Total Marks:** The complete paper carries a maximum of 200 marks.
- (iii) **Structure:** The paper has 3 Sections:
 - **Section A:** 50 Multiple Choice Questions (Physics).
 - **Section B:** 50 Multiple Choice Questions (Chemistry).
 - **Section B:** 100 Multiple Choice Questions (Biology).
- (iv) **Compulsory Questions:** All 200 questions are compulsory.
- (v) Each question has four options. Only **one** option is correct.
- (vi) **Correct Answer:** +1 marks.
- (vii) **Incorrect Answer:** (No Negative marking).
- (viii) **Unanswered/Marked for Review:** 0 marks.

1. Which of the following compound is not in gaseous phase at 25°C?

- (1) ClF
- (2) BrF₃
- (3) IF₃
- (4) ClF₃

2. A solution is prepared by dissolving 2 gram of non-volatile solute in 500 mL solution at 27°C. The osmotic pressure of the solution is 0.82 atm. The molar mass of the solute is:

- (1) 100 g mol^{-1}
 - (2) 120 g mol^{-1}
 - (3) 150 g mol^{-1}
 - (4) 180 g mol^{-1}
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3. What is the oxidation state of sulfur in Marshall's acid, $\text{H}_2\text{S}_2\text{O}_8$?

- (1) +4
 - (2) +5
 - (3) +6
 - (4) +7
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4. What is formed when an alkyl cyanide reacts with sodium in ether?

- (1) Primary amine
 - (2) Secondary amine
 - (3) Alkene
 - (4) Alcohol
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5. Which of the following is not amphoteric in nature?

- (1) NH_3
 - (2) HCl
 - (3) H_2O
 - (4) Cr_2O_3
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6. The rate of reaction $\text{A} \rightarrow \text{P}$ is $1.25 \times 10^{-2} \text{ mol dm}^{-3}\text{s}^{-1}$ when $[\text{A}] = 0.5 \text{ M}$. Calculate the rate constant if the reaction is second order in A.

- (1) 0.05
 - (2) 0.04
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(3) 0.03

(5) 0.01

7. Identify the unit of rate constant for a first-order reaction.

(1) $\text{mol dm}^{-3} \text{s}^{-1}$

(2) s^{-1}

(3) $\text{mol}^{-1} \text{dm}^3 \text{s}^{-1}$

(4) mol dm^{-3}

8. The magnetic moment of Cr^{3+} ion is 3.87 BM. The number of unpaired electrons present is:

(1) 1

(2) 2

(3) 3

(4) 4

9. Oil of wintergreen is chemically known as:

(1) Methyl acetate

(2) Methyl salicylate

(3) Ethyl salicylate

(4) Salicylic acid

10. Which of the following does not belong to Group 16 elements?

(1) Oxygen

(2) Sulfur

(3) Selenium

(4) Chlorine
