



General Instructions

- (i) **Duration:** The total duration of the examination is 2.5 hours (150 minutes).
- (ii) **Total Marks:** The complete paper carries a maximum of 500 marks.
- (iii) **Structure:** The paper has 4 Sections:
 - **Part 1:** 35 Multiple Choice Questions (Physics).
 - **Part 2:** 35 Multiple Choice Questions (Chemistry).
 - **Part 3:** 40 Multiple Choice Questions (Mathematics/Biology).
 - **Part 4:** 10 Multiple Choice Questions (Aptitude).
 - **Part 4:** 5 Multiple Choice Questions (English)
- (iv) **Compulsory Questions:** All 125 questions are compulsory.
- (v) Each question has four options. Only **one** option is correct.
- (vi) **Correct Answer:** +4 marks.
- (vii) **Incorrect Answer:** -1 (Negative marking).
- (viii) **Unanswered/Marked for Review:** 0 marks.

1. A wire of resistance R is stretched to double its original length. What is its new resistance?

- (A) $2R$
- (B) $4R$
- (C) $\frac{R}{2}$
- (D) R

2. What is the de Broglie wavelength of an electron accelerated through a potential difference of 100 V?

- (A) $0.1227 \text{ \AA}$
- (B) $1.227 \text{ \AA}$
- (C) $12.27 \text{ \AA}$
- (D) $0.01227 \text{ \AA}$

3. In a Young's Double Slit Experiment, if the distance between the slits is halved and the distance to the screen is doubled, what happens to the fringe width?

- (A) Doubled
- (B) Halved
- (C) Quadrupled
- (D) Unchanged

4. What is the coordination number of Cobalt in $[\text{Co}(\text{en})_3]^{3+}$?

- (A) 3
- (B) 4
- (C) 6
- (D) 2

5. Which gas is evolved when Sodium metal reacts with Ethanol?

- (A) Oxygen
- (B) Hydrogen

- (C) Nitrogen
(D) Carbon dioxide
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6. What is the order of a reaction if the rate constant unit is $L \cdot \text{mol}^{-1} \cdot \text{s}^{-1}$?

- (A) Zero order
(B) First order
(C) Second order
(D) Third order
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7. If $\tan^{-1} x + \tan^{-1} y = \frac{\pi}{4}$, then what is the value of $x + y + xy$?

- (A) 0
(B) 1
(C) 2
(D) -1
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8. Find the value of $\int_0^{\pi/2} \frac{\sin x}{\sin x + \cos x} dx$.

- (A) $\frac{\pi}{2}$
(B) $\frac{\pi}{8}$
(C) $\frac{\pi}{4}$
(D) 1
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9. What is the distance of the point (1, 2, 3) from the yz -plane?

- (A) 3
(B) 2
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- (C) 1
(D) $\sqrt{3}$
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10. Pointing to a man, a woman said, "His mother is the only daughter of my mother." How is the woman related to the man?

- (A) Sister
(B) Mother
(C) Aunt
(D) Grandmother
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11. Find the missing number in the series: 2, 6, 12, 20, 30, ?

- (A) 36
(B) 40
(C) 42
(D) 44
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12. If "WATER" is coded as "YCVGT", what is the code for "FIRE"?

- (A) HKTG
(B) HKUF
(C) HJTG
(D) HKTE
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13. Identify the error: "Neither the players nor the coach were present at the meeting."

- (A) Neither
(B) players
-

- (C) were
 - (D) meeting
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14. Choose the correct preposition: "The property was divided ____ the four brothers."

- (A) Between
 - (B) Among
 - (C) With
 - (D) For
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15. What is the antonym of "Vague"?

- (A) Uncertain
 - (B) Doubtful
 - (C) Precise
 - (D) Ambiguous
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