



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. If $S_n = 3n^2 + 5n$ represents the sum of n terms of an A.P, find the 10^{th} term (a_{10}).

- (A) 60
- (B) 62
- (C) 64
- (D) 66

2. Find the distance of the point $(1, -2, 3)$ from the yz -plane.

- (A) 0
- (B) 1
- (C) 2
- (D) 3

3. Evaluate the integral $\int \frac{1}{x \log x} dx$.

- (A) $\log |x| + C$
- (B) $\log |\log x| + C$
- (C) $\frac{1}{\log x} + C$
- (D) $\frac{\log x}{x} + C$

4. Calculate the de Broglie wavelength of an electron accelerated through a potential difference of 100V.

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

5. Find the electric flux through one face of a cube if a charge q is placed at its center.

- (A) $\frac{q}{\epsilon_0}$
- (B) $\frac{q}{2\epsilon_0}$
- (C) $\frac{q}{6\epsilon_0}$

(D) $\frac{q}{12\epsilon_0}$

6. A coil has a self-inductance of $2H$; find the induced EMF if the current changes from $5A$ to $2A$ in 0.1 seconds.

- (A) $30V$
 - (B) $40V$
 - (C) $50V$
 - (D) $60V$
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7. Identify the monomer units used in the preparation of Nylon-6,6.

- (A) Adipic acid and Hexamethylenediamine
 - (B) Terephthalic acid and Ethylene glycol
 - (C) Caprolactam
 - (D) Styrene
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8. Which of the following noble gas compounds has a square planar geometry: XeF_2 , XeF_4 , or XeF_6 ?

- (A) XeF_2
 - (B) XeF_4
 - (C) XeF_6
 - (D) None of these
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9. If 'ORANGE' is coded as 'PSBOHF', how is 'GRAPES' coded?

- (A) $HSBQFT$
 - (B) $HRBQFT$
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(C) *HSBQFS*

(D) *GSBQFT*

10. Point out the antonym of the word 'Vague'.

(A) Ambiguous

(B) Uncertain

(C) Precise

(D) Confusing
