



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. Evaluate the integral $\int_0^{\pi/2} \frac{\sin x}{\sin x + \cos x} dx$.

- (A) $\frac{\pi}{2}$
- (B) $\frac{\pi}{4}$
- (C) $\frac{\pi}{6}$
- (D) $\frac{\pi}{3}$

2. Find the area bounded by the curve $y^2 = 4x$ and its latus rectum.

- (A) $\frac{4}{3}$ sq units
- (B) $\frac{8}{3}$ sq units
- (C) $\frac{16}{3}$ sq units
- (D) $\frac{2}{3}$ sq units

3. What happens to the magnetic field at the center of a circular coil if the number of turns is doubled while current remains constant?

- (A) It becomes half ($\frac{B}{2}$)
- (B) It remains the same (B)
- (C) It doubles ($2B$)
- (D) It becomes four times ($4B$)

4. An object is placed 15 cm in front of a concave mirror of focal length 10 cm. Find the position and nature of the image.

- (A) 20 cm in front, real and inverted
- (B) 30 cm in front, real and inverted
- (C) 30 cm behind, virtual and erect
- (D) 15 cm behind, virtual and erect

5. Identify the IUPAC name for the coordination compound $[Co(NH_3)_6]Cl_3$.

- (A) Hexaamminecobalt(II) chloride
- (B) Hexaamminecobalt(III) chloride

- (C) Hexaamminecobalt(IV) chloride
(D) Amminecobalt(III) chloride
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6. Which of the following is an example of a condensation polymer?

- (A) Polyethylene
(B) PVC
(C) Nylon 6,6
(D) Polystyrene
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7. Find the missing number in the series: 2, 6, 12, 20, 30, __.

- (A) 38
(B) 40
(C) 42
(D) 44
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8. If 'FRIEND' is coded as 'HUMJTK', how is 'CANDLE' coded?

- (A) EDRJRI
(B) EDQJRI
(C) EDSJRI
(D) EDRKRI
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9. Choose the correct synonym for "Benevolent".

- (A) Cruel
(B) Kind/Generous
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- (C) Angry
 - (D) Selfish
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