



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:** 50 Multiple Choice Questions (Mathematics).
- (iv) **Compulsory Questions:** All 150 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. If A is a 3×3 matrix such that $|A| = 4$ and $B = \text{adj } A$, find the value of $|B|$.

- (A) 4
- (B) 8
- (C) 16
- (D) 64

2. Find the value of k if the function $f(x) = \frac{k \sin x}{x}$ is continuous at $x = 0$ and $f(0) = 3$.

- (A) 1

- (B) 2
 - (C) 3
 - (D) 6
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3. The converse of the statement $((\sim p) \wedge q) \rightarrow r$ is:

- (A) $r \rightarrow ((\sim p) \wedge q)$
 - (B) $((\sim p) \wedge q) \rightarrow (\sim r)$
 - (C) $r \rightarrow (\sim p)$
 - (D) $q \rightarrow r$
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4. Find the value of $\tan(105^\circ)$ using compound angle identities.

- (A) $2 + \sqrt{3}$
 - (B) $-(2 + \sqrt{3})$
 - (C) $1 + \sqrt{3}$
 - (D) $\sqrt{3} - 2$
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5. What is the power factor of an AC circuit containing only a pure resistor?

- (A) 0
 - (B) 0.5
 - (C) 1
 - (D) -1
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6. A ball is thrown upwards with a velocity of 20 m/s . Find the maximum height reached ($g = 10\text{ m/s}^2$).

- (A) 10 m
 - (B) 20 m
 - (C) 30 m
 - (D) 40 m
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7. A particle in SHM has a speed of 6 cm/s at the mean position and an amplitude of 4 cm . Find its position when its velocity is 2 cm/s .

- (A) $\frac{8\sqrt{2}}{3} \text{ cm}$
(B) $\frac{4\sqrt{2}}{3} \text{ cm}$
(C) $\frac{8}{3} \text{ cm}$
(D) $2\sqrt{2} \text{ cm}$
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8. Identify the product formed when phenol reacts with bromine water.

- (A) Bromobenzene
(B) *o*-Bromophenol
(C) 2,4,6-Tribromophenol
(D) Chlorobenzene
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9. What is the SI unit of molar conductivity?

- (A) S cm^{-1}
(B) $\text{S cm}^2 \text{ mol}^{-1}$
(C) S mol^{-1}
(D) S cm
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10. Which enzyme converts trypsinogen into active trypsin in the digestive system?

- (A) Pepsin
(B) Amylase
(C) Enterokinase
(D) Lipase
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11. What is the number of unit particles present in a Body-Centered Cubic (BCC) unit cell?

- (A) 1
(B) 2
(C) 4
(D) 6
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