

BITSAT 2026 May 24 Shift 1

Question Paper (Memory-Based)

Conducted by BITS Pilani



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 390 marks.
- (iii) **Structure:** The paper has 4 Sections:
 - **Part 1:** 30 Multiple Choice Questions (Physics).
 - **Part 2:** 30 Multiple Choice Questions (Chemistry).
 - **Part 3:** 10 Multiple Choice Questions (English Proficiency),
20 Multiple Choice Questions (Logical Reasoning)
 - **Part 4:** 40 Multiple Choice Questions (Mathematics/Biology)
- (iv) **Compulsory Questions:** All 130 questions are compulsory, and +12 Questions (Optional Extra Questions)
- (v) Each question has four options. Only **one** option is correct.
- (vi) **Correct Answer:** +3 marks.
- (vii) **Incorrect Answer:** -1 (Negative marking).
- (viii) **Unanswered/Marked for Review:** 0 marks.

PHYSICS

1. A projectile is fired from the surface of the earth with a velocity of v_0 at an angle θ with the horizontal. If the maximum height reached is equal to its horizontal range, then the angle of projection θ is given by:

- (A) $\tan^{-1}(1)$
 - (B) $\tan^{-1}(2)$
 - (C) $\tan^{-1}(4)$
 - (D) $\tan^{-1}(0.5)$
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2. A particle moves under the action of a variable force $F = (3x^2 - 2x + 5)$ in Newtons from $x = 0$ to $x = 2$ meters. The work done by the force is:

- (A) 10 J
 - (B) 12 J
 - (C) 14 J
 - (D) 16 J
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3. The ratio of the radii of gyration of a hollow cone and a hollow cylinder of the same mass and radius about a tangential axis parallel to their central axis is:

- (A) $\sqrt{3} : \sqrt{2}$
 - (B) $\sqrt{3} : 2$
 - (C) $1 : \sqrt{2}$
 - (D) $\sqrt{5} : \sqrt{6}$
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4. The escape velocity from the earth is v_e . If an object is now launched from the center of Earth where a tunnel has been dug, the escape velocity from that position is:

- (A) $v_e \sqrt{\frac{3}{2}}$
 - (B) $\frac{2v_e}{\sqrt{3}}$
 - (C) $\frac{v_e}{\sqrt{2}}$
 - (D) $v_e \sqrt{2}$
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CHEMISTRY

5. If 20 g of CaCO_3 is treated with 100 mL of 20% HCl solution, the amount of CO_2 produced is:

- (A) 22.4 L
 - (B) 8.80 g
 - (C) 4.40 g
 - (D) 2.24 L
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6. The density (in g mL^{-1}) of a 3.60 M sulphuric acid solution that is 29% H_2SO_4 (molar mass = 98 g mol^{-1}) by mass will be:

- (A) 1.64
 - (B) 1.88
 - (C) 1.22
 - (D) 1.45
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7. The degeneracy of a hydrogen atom whose energy equals $-R_H/16$ is:

- (A) 8
 - (B) 9
 - (C) 16
 - (D) 10
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8. If the de-Broglie wavelength of a particle of mass (m) is 100 times its velocity, then its value in terms of its mass (m) and Planck's constant (h) is:

- (A) $\frac{1}{10} \sqrt{\frac{m}{h}}$
 - (B) $10 \sqrt{\frac{h}{m}}$
 - (C) $\frac{1}{10} \sqrt{\frac{h}{m}}$
 - (D) $10 \sqrt{\frac{m}{h}}$
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MATHEMATICS

9. The probability that a certain electronic component fails when first used is 0.10. If it does not fail immediately, the probability that it lasts for one year is 0.99. The probability that a new component will last for one year is:

- (A) 0.99
 - (B) 0.871
 - (C) 0.891
 - (D) 0.762
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10. The shortest distance between the lines

$$x = y + 2 = 6z - 6$$

and

$$x + 1 = 2y = -12z$$

is:

- (A) $\frac{1}{2}$
 - (B) 2
 - (C) 1
 - (D) $\frac{3}{2}$
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11. If $\vec{a} = 2\hat{i} + \hat{j} + 2\hat{k}$, then the value of $|\hat{i} \times (\vec{a} \times \hat{i})|^2 + |\hat{j} \times (\vec{a} \times \hat{j})|^2 + |\hat{k} \times (\vec{a} \times \hat{k})|^2$ is equal to:

- (A) 17
 - (B) 18
 - (C) 19
 - (D) 20
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12. The line $y = mx$ bisects the area enclosed by the lines $x = 0$, $y = 0$, $x = \frac{3}{2}$ and the curve $y = 1 + 4x - x^2$. Then, the value of m is:

- (A) $13/6$
 - (B) $13/2$
 - (C) $13/5$
 - (D) $13/7$
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