

BITSAT 2025 June 22 Shift 2 Question Paper

Time Allowed :3 Hours	Maximum Marks :390	Total questions :130
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General Instructions

Read the following instructions very carefully and strictly follow them:

1. Duration of Exam: 3 Hours
2. Total Number of Questions: 130 Questions
3. Section-wise Distribution of Questions:
 - Physics - 40 Questions
 - Chemistry - 40 Questions
 - Mathematics - 50 Questions
4. Type of Questions: Multiple Choice Questions (Objective)
5. Marking Scheme: Three marks are awarded for each correct response
6. Negative Marking: One mark is deducted for every incorrect answer.
7. Each question has four options; only one is correct.
8. Questions are designed to test analytical thinking and problem-solving skills.

1. A radio wave travels in a medium with refractive index 1.5. What is the speed of light in this medium if the speed of light in vacuum is 3×10^8 m/s?

- (A) 2×10^8 m/s
(B) 1.5×10^8 m/s
(C) 2.5×10^8 m/s
(D) 1.6×10^8 m/s

2. A concave mirror produces an image that is real, inverted, and diminished. What is the position of the object in relation to the mirror?

- (A) At the focal point
 - (B) Between the focus and the mirror
 - (C) Beyond twice the focal length
 - (D) Between the focus and twice the focal length
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3. In an isobaric process, 200 J of heat is supplied to a gas. The gas does 50 J of work. What is the change in internal energy?

- (A) 150 J
 - (B) 250 J
 - (C) 100 J
 - (D) 200 J
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4. The rate of a reaction doubles when the temperature is increased by 10°C. What is the approximate value of the activation energy?

- (A) 60 kJ/mol
 - (B) 100 kJ/mol
 - (C) 120 kJ/mol
 - (D) 150 kJ/mol
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5. What is the major product when 1-bromopropane undergoes nucleophilic substitution with OH^- ?

- (A) Propan-1-ol
 - (B) Propan-2-ol
 - (C) 1,2-Propanediol
 - (D) Propene
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6. What is the dot product of the vectors $\mathbf{a} = (2, 3, 1)$ and $\mathbf{b} = (1, -1, 4)$?

- (A) 5

- (B) 4
 - (C) 7
 - (D) 10
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7. Find the value of the integral:

$$\int_0^{\pi} \sin^2(x) dx.$$

- (A) 0
 - (B) $\frac{\pi}{2}$
 - (C) $\frac{\pi}{4}$
 - (D) π
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8. A box contains 5 red balls and 3 blue balls. If two balls are drawn randomly without replacement, what is the probability that one of the balls is red and the other is blue?

- (A) $\frac{5}{8}$
 - (B) $\frac{15}{28}$
 - (C) $\frac{3}{8}$
 - (D) $\frac{1}{2}$
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9. Find the angle between the vectors $\mathbf{a} = (2, 3, 1)$ and $\mathbf{b} = (1, -1, 4)$.

- (A) 45°
 - (B) 60°
 - (C) 90°
 - (D) 120°
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10. Find the determinant of the matrix $A = \begin{bmatrix} 2 & 3 \\ 4 & 5 \end{bmatrix}$.

- (A) 0
- (B) 4
- (C) 9

