

BITSAT 2025 May 27 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. If $A = \begin{bmatrix} 3 & 1 \\ 2 & 4 \end{bmatrix}$, then the determinant of the adjoint of A^2 is:

- A) 121
 - B) 144
 - C) 169
 - D) 196
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2. If $f(x) = \sin^{-1}(2x\sqrt{1-x^2})$, then $f'(x)$ is:

- A) $\frac{2(1-2x^2)}{\sqrt{1-4x^2(1-x^2)}}$
 - B) $\frac{2x(1-2x^2)}{\sqrt{1-4x^2(1-x^2)}}$
 - C) $\frac{1-2x^2}{\sqrt{1-4x^2(1-x^2)}}$
 - D) $\frac{2x\sqrt{1-x^2}}{1-x^2}$
-

3. If $y = \tan^{-1}\left(\frac{2x}{1-x^2}\right)$, then $\frac{dy}{dx}$ is:

- A) $\frac{2}{1+x^2}$
 - B) $\frac{1-x^2}{1+x^2}$
 - C) $\frac{2}{(1-x^2)^2}$
 - D) $\frac{2}{1-x^2}$
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4. If the roots of the quadratic equation $x^2 + 4x + k = 0$ are real and equal, then the value of k is:

- A) 2
 - B) 4
 - C) 8
 - D) 16
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5. If $f(x) = x^2 + 3x$, then $f'(x)$ is:

- A) $x + 3$
- B) $2x + 3$
- C) $x^2 + 3$
- D) $2x$

6. Find the slope of the line passing through the points (1, 2) and (3, 6):

- A) 3
 - B) 2
 - C) 4
 - D) 1
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7. A body starts from rest and moves with constant acceleration. If it covers a distance of 40 m in 4 seconds, then its acceleration is:

- A) 5 m/s^2
 - B) 2.5 m/s^2
 - C) 10 m/s^2
 - D) 4 m/s^2
-

8. If a force of 10 N displaces a body by 5 m in the direction of the force, the work done is:

- A) 2 J
 - B) 50 J
 - C) 0 J
 - D) 5 J
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9. A block of mass 5 kg is placed on a rough horizontal surface. A horizontal force of 25 N is applied. If the coefficient of friction is 0.4, what is the acceleration of the block? (Take $g = 10 \text{ m/s}^2$)

- A) 1 m/s^2
 - B) 2 m/s^2
 - C) 3 m/s^2
 - D) 4 m/s^2
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10. Three resistors of 2Ω , 3Ω , and 6Ω are connected in parallel. What is the equivalent resistance of the combination?

- A) 1Ω
 - B) 2Ω
 - C) 3Ω
 - D) 4Ω
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11. How many moles are present in 22 g of carbon dioxide (CO_2)? (Molar mass of CO_2 = 44 g/mol)

- A) 0.25 mol
 - B) 0.5 mol
 - C) 1 mol
 - D) 2 mol
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12. Which of the following elements has the highest electronegativity?

- A) Sodium
 - B) Fluorine
 - C) Oxygen
 - D) Chlorine
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13. Which of the following molecules has a linear shape?

- A) H_2O
 - B) CO_2
 - C) NH_3
 - D) SO_2
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14. Which of the following is a strong acid?

- A) CH_3COOH
 - B) HCl
 - C) NH_4^+
 - D) H_2CO_3
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15. Which of the following is an alkene?

- A) C_2H_6

B) C_2H_4

C) C_3H_8

D) C_4H_{10}

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