BITSAT 2025 May 27 Shift 2 Question Paper

Time Allowed :3 Hours | **Maximum Marks :**390 | **Total questions :**130

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

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) $\frac{2}{1-x^2}$

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

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
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) $5 \mathrm{m/s}^2$
B) $2.5 \mathrm{m/s}^2$
C) 10m/s^2
D) 4 m/s^2
8. If a force of $10\mathrm{N}$ displaces a body by $5\mathrm{m}$ in the direction of the force, the work done
is:
A) 2 J
B) 50 J
C) 0 J
D) 5 J
9. A block of mass 5 kg is placed on a rough horizontal surface. A horizontal force of
$25\mathrm{N}$ 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
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
11. How many moles are present in 22 g of carbon dioxide (CO ₂)? (Molar mass of CO
= 44 g/mol)
A) 0.25 mol
B) 0.5 mol
C) 1 mol
D) 2 mol
12. Which of the following elements has the highest electronegativity?
A) Sodium
B) Fluorine
C) Oxygen
D) Chlorine
13. Which of the following molecules has a linear shape?
A) H_2O
B) CO_2
C) NH ₃
D) SO_2
14. Which of the following is a strong acid?
A) CH ₃ COOH
B) HCl
C) NH ₄ ⁺
D) H_2CO_3
15. Which of the following is an alkene?
A) C_2H_6

- B) C₂H₄
- C) C₃H₈
- D) C₄H₁₀