

## **BITSAT 2025 June 22 Shift 1 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. A block of mass 2 kg slides on a frictionless horizontal surface with a velocity of 3 m/s. It collides elastically with another block of mass 3 kg initially at rest. What is the velocity of the 2 kg block after the collision?

- (A) 1 m/s
  - (B) 1.5 m/s
  - (C) 2 m/s
  - (D) 2.5 m/s
- 

2. The electric field at a point on the axis of a uniformly charged ring of radius R at a distance x from its center is given by:

$$E = \frac{1}{4\pi\epsilon_0} \cdot \frac{2\pi kQx}{(x^2 + R^2)^{3/2}}$$

If  $x = 2R$ , what is the magnitude of the electric field?

- (A)  $\frac{kQ}{R^2}$
  - (B)  $\frac{2kQ}{R^2}$
  - (C)  $\frac{3kQ}{R^2}$
  - (D)  $\frac{kQ}{2R^2}$
- 

3. A gas expands isothermally and reversibly from a volume V to 2V. If the initial pressure is P, what is the final pressure?

- (A)  $\frac{P}{2}$
  - (B)  $\frac{P}{4}$
  - (C) 2P
  - (D) P
- 

4. For a reaction  $A \rightarrow B$ , the concentration of A decreases from 0.8 M to 0.2 M in 10 minutes. If the rate constant is  $0.1 \text{ min}^{-1}$ , what is the order of the reaction?

- (A) 0
- (B) 1
- (C) 2

(D) 3

---

**5. Find the value of the integral:**

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

(A) 0

(B)  $\frac{\pi}{2}$

(C)  $\frac{\pi}{4}$

(D)  $\pi$

---

**6. A bag contains 5 red, 3 blue, and 2 green balls. If two balls are drawn at random without replacement, what is the probability that both are red?**

(A)  $\frac{1}{2}$

(B)  $\frac{1}{3}$

(C)  $\frac{5}{9}$

(D)  $\frac{1}{6}$

---

**7. Find the angle between the vectors  $\mathbf{a} = (2, -1, 3)$  and  $\mathbf{b} = (1, 4, -2)$ .**

(A)  $45^\circ$

(B)  $60^\circ$

(C)  $90^\circ$

(D)  $120^\circ$

---

**8. If  $A = \begin{bmatrix} 2 & 3 \\ 4 & 5 \end{bmatrix}$ , find the determinant of  $A^2$ .**

(A) 0

(B) 4

(C) 9

(D) 25

---