# BITSAT 2025 June 26 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 particle moves with a constant speed of 4 m/s in a circular path of radius 2 m. What is its centripetal acceleration?**
(A) 8 $m/s^2$
(B) 4 $m/s^2$
(C) 16 $m/s^2$
(D) 2 $m/s^2$

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**2. A capacitor of capacitance 5 $\mu$F is charged to 100 V and then connected to an uncharged capacitor of 2 $\mu$F. What is the final potential difference across the capacitors?**
(A) 71.43 V
(B) 50 V
(C) 28.57 V
(D) 100 V

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**3. Which of the following gases has the highest rate of diffusion?**
(A) $O_2$
(B) $CO_2$

(C) $H_2$
(D) $N_2$

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**4. What is the pH of a 0.01 M solution of HCl?**
(A) 1
(B) 2
(C) 3
(D) 4

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**5. If the roots of the quadratic equation $x^2 - 6x + k = 0$ are real and distinct, what is the range of values for $k$?**
(A) $k > 9$
(B) $k < 9$
(C) $k > 0$
(D) $k < 0$

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**6. What is the value of $\int_0^{\pi/2} \sin x \cos x \, dx$?**
(A) 0
(B) 1/2
(C) 1
(D) 1/4

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**7. A body of mass 2 kg is moving with a velocity of 10 m/s. What is its kinetic energy?**
(A) 100 J
(B) 200 J
(C) 50 J
(D) 400 J

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**8. Which of the following elements has the highest electronegativity?**
(A) Sodium
(B) Chlorine
(C) Oxygen
(D) Fluorine

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**9. If $\sin\theta + \cos\theta = \sqrt{2}$, what is the value of $\sin\theta\cos\theta$?**
(A) $\frac{1}{2}$
(B) $\frac{1}{4}$

(C) 1
(D) 0

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**10. A simple pendulum of length 1 m is oscillating with an amplitude of 0.1 m. What is the maximum tension in the string if the mass of the bob is 0.2 kg? (Assume $g = 10\,\mathrm{m/s^2}$)**
(A) 2.2 N
(B) 2.4 N
(C) 2.0 N
(D) 2.6 N

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**11. In the reaction $2SO_2 + O_2 \rightarrow 2SO_3$, if 64 g of $SO_2$ reacts completely, how many grams of $SO_3$ are produced? (Molar mass of $SO_2 = 64\,\mathrm{g/mol}, SO_3 = 80\,\mathrm{g/mol}$)**
(A) 80 g
(B) 64 g
(C) 100 g
(D) 128 g

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**12. What is the sum of the first 10 terms of the arithmetic progression with first term 3 and common difference 2?**
(A) 120
(B) 105
(C) 75
(D) 90

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**13. Choose the word closest in meaning to 'Candid'.**
(A) Secretive
(B) Honest
(C) Reserved
(D) Deceptive

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**14. A sequence is defined as follows: $a_1 = 1, a_2 = 2$, and $a_n = a_{n-1} + a_{n-2}$ for $n \geq 3$. What is the 6th term of the sequence?**
(A) 5
(B) 8
(C) 13
(D) 21

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