# IIITH UGEE 2026 SUPR

## Question Paper

Conducted by IIIT, Hyderabad

INTERNATIONAL INSTITUTE OF INFORMATION TECHNOLOGY
HYDERABAD

## General Instructions

**(i) Duration and Timing:**

- The duration of the SUPR section is **60 minutes**.
- This is a Computer Based Test (CBT). A digital timer will be displayed on the top right corner of the screen.

**(ii) Question Structure:**

- This section consists of **50 Multiple Choice Questions (MCQs)**.
- Each question has four options, out of which only **one** is correct.

**(iii) Marking Scheme:**

- Each correct answer will be awarded **+1 mark**.
- For each incorrect answer, **0.25 marks** will be deducted (Negative Marking).
- No marks will be awarded or deducted for unattempted questions.

**(iv) Navigation:**

- Use the "Save & Next" button to lock your answer and move to the next question.
- Use the "Mark for Review" button if you wish to revisit a question later.
- Questions marked for review will be considered for evaluation only if an option is selected.

**(v) Subject Coverage:**

- The questions are based on the CBSE 11th and 12th grade syllabus for **Physics, Chemistry, and Mathematics**.

**1. If $\frac{d^2y}{dx^2} = \cos\left(\frac{dy}{dx}\right)$, find the order and the degree of the resulting differential equation.**

(A) Order 2, Degree 4

(B) Cannot be determined

(C) Order 3, Degree 1

(D) Data Insufficient

(E) None of these

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**2. Find the value of $(125)^{\log_{625} 5}$.**

(A) 15

(B) 25

(C) $5\sqrt{5}$

(D) 3

(E) None

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**3. If $f(x) = \int e^x \left(\frac{x^2+x+1}{\sqrt{x^2+1}}\right) dx$ such that the value of the function is 1 when $x$ vanishes, find the value of $f(1)$.**

(A) $\sqrt{3}\,e$

(B) $\sqrt{5}\,e$

(C) $\sqrt{2}\,e$

(D) $e$

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**4. Let $P$ be any point on the curve $x^{2/3} + y^{2/3} = a^{2/3}$. Then, what would be the length of the segment of the tangent between the coordinate axes?**

(A) $a$

(B) $2a$

(C) $3a$

(D) $4a$

(E) $5a$

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**5. Number of ways of distributing 10 identical chocolates among 3 children such that everyone gets at least one?**

(A) $2^4 + 3 \cdot 2^5 - 2$

(B) $2^4 - 3 \cdot 2^5 - 2$

(C) $2^5 + 4$

(D) $2^5 - 4$

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**6. A block of mass $m$ is moving on a horizontal frictionless surface with velocity $v$. It hits a spring of constant $k$ and compresses it by a distance $x$. If the initial velocity is doubled, what will be the new compression?**

(A) $2x$

(B) $\sqrt{2}\,x$

(C) $4x$

(D) $x/2$

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**7. If $P_A^0$ and $P_B^0$ are the vapour pressures of pure liquids A and B, what is the total pressure of an ideal solution where the mole fraction of A is $0.4$?**

(A) $0.4P_A^0 + 0.6P_B^0$

(B) $0.6P_A^0 + 0.4P_B^0$

(C) $P_A^0 + P_B^0$

(D) $0.5(P_A^0 + P_B^0)$

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**8. If the $n^{th}$ term of an A.P. is $2n + 5$, find the sum of the first 10 terms.**

(A) 110

(B) 155

(C) 160

(D) 165

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**9. A pair of fair dice is rolled. What is the probability that the second die lands on a higher value than the first?**

(A) $\frac{1}{36}$

(B) $\frac{5}{36}$

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

(D) $\frac{5}{12}$

**10. What is the maximum number of electrons that can be accommodated in a subshell with orbital angular momentum quantum number $l = 3$?**

(A) 6

(B) 10

(C) 14

(D) 18

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**11. Two dice are thrown simultaneously. What is the probability that the sum of the numbers appearing on the dice is a prime number?**

(A) $\frac{5}{12}$

(B) $\frac{7}{12}$

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

(D) $\frac{13}{36}$

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