CUET 2026 May 29 Shift 1 Mathematics

Question Paper (Memory-Based) with Solutions

Conducted by National Testing Agency (NTA)

General Instructions

(i) The examination will be conducted in Computer-Based Test (CBT) mode.

(ii) Each question carries +5 marks for correct answer and -1 mark for wrong answer.

(iii) The total number of questions are 50.

(iv) Duration of the exam is 1 hour (60 minutes).

1. Let A be a 3×3 matrix such that $A^2 = I$. If $\det(A) = -1$ and the sum of eigenvalues is 1, find the set of eigenvalues of A.

(A) $1, 1, 1$

(B) $1, 1, -1$

(C) $-1, -1, 1$

(D) $-1, -1, -1$

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2. Analyze the function $f(x) = |x-1| + |x-2| + |x-3|$. Determine the points where the derivative $f'(x)$ is undefined.

(A) $x = 1, 3$

(B) $x = 1, 2, 3$

(C) $x = 1.5, 2.5$

(D) $x = 0$

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3. Identify the order and degree of the differential equation:

$$\left(\frac{d^3y}{dx^3}\right)^2 + 4\left(\frac{dy}{dx}\right)^4 + y = \sin(x)$$

(A) Order 3, Degree 4

(B) Order 3, Degree 2

(C) Order 4, Degree 3

(D) Order 1, Degree 4

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4. For the linear differential equation

$$\frac{dy}{dx} + \frac{2}{x}y = x^2$$

calculate the integrating factor (I.F.).

(A) x

(B) x^2

(C) x^3

(D) $\ln(x)$

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5. Maximize $Z = 5x + 3y$ subject to $x + y \leq 6$ and $x, y \geq 0$. Where does the maximum value occur?

(A) $(0, 0)$

(B) $(0, 6)$

(C) $(6, 0)$

(D) $(3, 3)$

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6. A bag has 4 red and 6 black balls. Two balls are drawn without replacement. What is the probability that the second is red given the first was black?

(A) 4/10

(B) 4/9

(C) 6/9

(D) 2/9

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7. Find the domain of the function $f(x) = \sin^{-1}(3x - 1)$.

(A) $[-1, 1]$

(B) $[0, \frac{2}{3}]$

(C) $[-\frac{1}{3}, \frac{1}{3}]$

(D) $[\frac{1}{3}, 1]$

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8. For vectors $\vec{a} = 3\hat{i} - \hat{j} + 2\hat{k}$ and $\vec{b} = \hat{i} + 2\hat{j} - \hat{k}$, find the scalar projection of $\vec{a}$ onto $\vec{b}$.

(A) $-\frac{1}{\sqrt{6}}$

(B) $\frac{1}{\sqrt{6}}$

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

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

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9. Let R be a relation on $\{1, 2, 3\}$ defined by

$$R = \{(1, 1), (2, 2), (3, 3), (1, 2)\}$$

Identify the properties satisfied by R.

(A) Symmetric only

(B) Reflexive and Transitive

(C) Equivalence relation

(D) None of these

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10. Find the local maximum point of the function

$$f(x) = -x^3 + 3x + 1$$

(A) $x = 1$

(B) $x = -1$

(C) $x = 0$

(D) $x = \sqrt{3}$
