CUET 2026 May 22 Mathematics Shift 1

Question Paper (Memory-Based)

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 a correct answer and -1 mark for a wrong answer.

(iii) The total number of questions is 50.

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

1. Find the total area of the region bounded by the parabola $y^2 = 4x$ and the straight line $y = x$.

(A) $\frac{4}{3}$

(B) $\frac{8}{3}$

(C) $\frac{16}{3}$

(D) 2

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2. Determine the sum of the order and the degree of the differential equation given by: $y = x\frac{dy}{dx} + \sqrt{1 + \left(\frac{dy}{dx}\right)^2}$

(A) 2

(B) 4

(C) 3

(D) 1

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3. If the three vectors $\vec{a} = \hat{i} + \lambda\hat{j} + \hat{k}$, $\vec{b} = \hat{j} + \hat{k}$, and $\vec{c} = \hat{i} + \hat{j}$ are coplanar, find the exact value of the scalar constant λ.

(A) 0

(B) 1

(C) -2

(D) 2

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4. A straight vector line makes equal acute angles $\alpha = \beta = \gamma$ with all three primary coordinate axes. Find the absolute value of $\cos\alpha$.

(A) $\frac{1}{\sqrt{3}}$

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

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

(D) 1

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5. Simplify the inverse trigonometric expression to find its principal value: $\tan^{-1}\left(\frac{1}{2}\right)+\tan^{-1}\left(\frac{1}{3}\right)$

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

(B) $\tan^{-1}\left(\frac{2}{5}\right)$

(C) $\frac{\pi}{3}$

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

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6. Under what condition will a linear programming system containing objective function variables have no common feasible region?

(A) When the objective function coefficients are set strictly to zero.

(B) When the system of linear constraints is mutually inconsistent, meaning there is no overlapping coordinate space that satisfies all conditions at once.

(C) When all constraints are written using strictly non-negative bounding limits.

(D) When the optimal solution point matches one of the outer corner coordinates.

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7. Find the total area of the region bounded between the curve $y = x^3$, the x-axis, and the vertical lines $x = -1$ and $x = 1$.

(A) 0

(B) $\frac{1}{4}$

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

(D) 1

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8. Determine the degree of the following differential equation: $\left[1+\left(\frac{dy}{dx}\right)^2\right]^{\frac{3}{2}}=\frac{d^2y}{dx^2}$

(A) Not defined

(B) 2

(C) 3

(D) 1

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9. If the straight line equation $\frac{x-1}{2}=\frac{y-2}{3}=\frac{z-3}{4}$ **runs completely parallel to the plane surface given by** $Ax+2y+3z=5$**, find the value of the coefficient** A**.**

(A) 9

(B) 0

(C) -9

(D) -4

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10. Find the maximum value of the linear objective function $Z=3x+4y$ **subject to the system constraints:** $x+y\leq 4$, $x\geq 0$**, and** $y\geq 0$**.**

(A) 12

(B) 16

(C) 24

(D) 0
