CUET 2026 May 22 Shift 2 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 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. If A is a non-singular square matrix of order 3×3 such that its determinant is $|A| = 5$, find the absolute value of the determinant of its adjoint matrix, represented as $|\text{adj}(A)|$.

(A) 5

(B) 125

(C) 25

(D) 15

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2. Determine the exact expression for the Integrating Factor (I.F.) of the following first-order linear differential equation: $\frac{dy}{dx} - y \tan x = e^x$

(A) $\sec x$

(B) $\cos x$

(C) $\sin x$

(D) $e^{-\tan x}$

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3. Find the open interval across which the cubic polynomial function $f(x) = 2x^3 - 3x^2 - 36x + 7$ is classified as strictly decreasing.

(A) $(-2, 3)$

(B) $(-\infty, -2) \cup (3, \infty)$

(C) $(-3, 2)$

(D) $(0, \infty)$

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4. Find the shortest distance between the two parallel straight lines whose vector position equations are given by:

$$\vec{r} = (\hat{i} + 2\hat{j} - 4\hat{k}) + \lambda(2\hat{i} + 3\hat{j} + 6\hat{k})$$

$$\vec{r} = (3\hat{i} + 3\hat{j} - 5\hat{k}) + \mu(2\hat{i} + 3\hat{j} + 6\hat{k})$$

(A) $\sqrt{2}$

(B) $\frac{\sqrt{293}}{7}$

(C) 0

(D) $\frac{5}{7}$

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5. Find the maximum value of the linear objective optimization function

$$Z = 4x + y$$

evaluated over a feasible region bounded by the corner vertices:

$$(0, 0),\ (3, 0),\ (2, 3),\ \textbf{and}\ (0, 4).$$

(A) 12

(B) 4

(C) 11

(D) 16

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6. If A is a square matrix of order 3 such that its determinant is $|A| = 3$, calculate the value of the scalar matrix determinant represented by $|2A|$.

(A) 6

(B) 24

(C) 12

(D) 18

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7. An unbiased coin is tossed twice. Let event A represent getting a head on the first toss, and event B represent getting a head on the second toss. Determine the mathematical relationship between events A and B.

(A) Dependent Events

(B) Independent Events

(C) Mutually Exclusive Events

(D) Equivalence Events

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8. Find the equation of the normal to the curve $y = x^2 - x$ at the coordinate point position $(1, 0)$.

(A) $x + y - 1 = 0$

(B) $x - y - 1 = 0$

(C) $x + y + 1 = 0$

(D) $2x + y - 2 = 0$

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9. Evaluate the value of the following definite integral using standard calculus integrations: $\int_0^1 xe^x \, dx$

(A) e

(B) 1

(C) $e - 1$

(D) 0

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10. Find the total number of distinct binary relations that can be defined over a set A containing exactly 3 elements.

(A) 9

(B) 64

(C) 512

(D) 27
