CUET 2026 May 31 Shift 2 Mathematics

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 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. If

$$y(x)=\det\begin{pmatrix}\sin x & \cos x & \sin x+\cos x+1\\ 27 & 28 & 27\\ 1 & 1 & 1\end{pmatrix}$$

for $x\in\mathbb{R}$, then $\frac{d^2y}{dx^2}+y$ equals:

(A) -1

(B) 0

(C) 1

(D) 2

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2. Let $y=f(x)$ satisfy

$$\frac{dy}{dx}+\frac{xy}{x^2-1}=\frac{x^6+4x}{\sqrt{1-x^2}},\ -1<x<1$$

with $f(0)=0$. If

$$6\int_{-1/2}^{1/2}f(x)\,dx=2\pi-\alpha,$$

then α^2 equals:

(A) 25

(B) 26

(C) 27

(D) 28

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3. If the system

$$2x + \lambda y + 3z = 5, \quad 3x + 2y - z = 7, \quad 4x + 5y + \mu z = 9$$

has infinitely many solutions, then $\lambda^2 + \mu^2$ equals:

(A) 20

(B) 24

(C) 26

(D) 28

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4. Let $f : \mathbf{R} \to \mathbf{R}$ be a thrice differentiable odd function satisfying $f'(x) \geq 0$, $f''(x) = f(x)$, $f(0) = 0$, $f'(0) = 3$. Then $9f(\ln 3)$ equals:

(A) 24

(B) 30

(C) 36

(D) 42

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5. Let $y = y(x)$ satisfy

$$\cos x(\log(\cos x))^2\, dy + (\sin x - 3y \sin x \log(\cos x))dx = 0, \quad x \in (0, \pi/2).$$

If $y(\pi/4) = -\frac{1}{\log 2}$, then $y(\pi/6)$ equals:

(A) $\frac{1}{\log 3 - \log 4}$

(B) $\frac{1}{\log 2}$

(C) $\frac{1}{\log 3}$

(D) $\frac{1}{\log 4}$

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6. If

$$f(x) = \int \frac{1}{x^{1/4}(1 + x^{1/4})} dx, \quad f(0) = -6,$$

then $f(1)$ equals:

(A) $4(\ln 2 - 2)$

(B) $4(\ln 2 - 1)$

(C) $2(\ln 2 - 1)$

(D) $6(\ln 2 - 2)$

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7. The number of relations on $A = \{1, 2, 3\}$ containing at most 6 elements including (1,2), that are reflexive and transitive but not symmetric is:

(A) 4

(B) 5

(C) 6

(D) 7

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8. The number of singular matrices of order 2, whose elements are from the set $\{2, 3, 6, 9\}$, is:

(A) 32

(B) 36

(C) 40

(D) 44

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9. Let $a \in \mathbf{R}$ and A be a matrix of order 3×3 such that $\det(A) = -4$ and

$$A + I = \begin{bmatrix} 1 & a & 1 \\ 2 & 1 & 0 \\ a & 1 & 2 \end{bmatrix}.$$

If $\det((a+1)\,\text{adj}((a-1)A))$ is $2^m 3^n$, then $m+n$ equals:

(A) 14

(B) 07

(C) 18

(D) 20

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10. Let

$$A = \begin{bmatrix} \log_5 128 & \log_4 5 \\ \log_5 8 & \log_4 25 \end{bmatrix}.$$

If A_{ij} is cofactor of a_{ij}, $C_{ij} = \sum_{k=1}^{2} a_{ik}A_{jk}$, and $C = [C_{ij}]$, then $8|C|$ equals:

(A) 238

(B) 240

(C) 242

(D) 244
