CUET 2026 May 20 shift 1 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. Let A be a non-singular 3×3 matrix satisfying the equation $A^3 - 6A^2 + 11A - 6I = O$. If $B = A^2 - 5A + 7I$ and $\det(A) = 6$, then the value of $\det(B)$ is equal to:

(A) 8

(B) 27

(C) 64

(D) 1

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2. Evaluate the indefinite integral: $\int \frac{x^2+1}{x^4+1}\,dx$

(A) $\frac{1}{\sqrt{2}} \tan^{-1}\left(\frac{x^2-1}{\sqrt{2}x}\right) + C$

(B) $\tan^{-1} x + C$

(C) $\frac{1}{2}\ln(x^2+1) + C$

(D) $\frac{x}{x^2+1} + C$

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3. If A is a square matrix of order 3 such that $|2(\text{adj}A)| = 288$, then the possible value of the determinant $|A|$ is:

(A) 144

(B) 36

(C) ± 12

(D) ± 6

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4. Find the value of the composite inverse trigonometric expression: $\cot^{-1}\left[2\cos\left(2\sin^{-1}\frac{1}{2}\right)\right]$

(A) $\frac{\pi}{6}$

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

(C) $\frac{2\pi}{3}$

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

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5. Find the general solution of the differential equation: $\frac{dy}{dx}+\frac{y}{x}=x^2$

(A) $yx=\frac{x^4}{4}+C$

(B) $y=x^3+Cx$

(C) $yx^2=\frac{x^3}{3}+C$

(D) $y=\frac{x^4}{4}+C$

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6. The value of the determinant $\begin{vmatrix} x+a & y & z \\ x & y+b & z \\ x & y & z+c \end{vmatrix} = abc$**, where** $a,b,c\neq 0$**. The value of the expression** $\frac{x}{a}+\frac{y}{b}+\frac{z}{c}$ **is:**

(A) 0

(B) 1

(C) -1

(D) 2

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7. Find the shortest distance between the two parallel lines given by the vector equations: $\vec{r}=(\hat{i}+2\hat{j}-4\hat{k})+\lambda(2\hat{i}+3\hat{j}+6\hat{k})$ **and** $\vec{r}=(3\hat{i}+3\hat{j}-5\hat{k})+\mu(2\hat{i}+3\hat{j}+6\hat{k})$

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

(B) $\frac{\sqrt{293}}{49}$

(C) 2

(D) 0

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8. A bag contains 5 **red and** 4 **black balls. Two balls are drawn at random one after the other**

without replacement. What is the conditional probability that the second ball drawn is red, given that the first ball drawn was black?

(A) $\frac{5}{8}$

(B) $\frac{5}{9}$

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

(D) $\frac{4}{9}$

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9. Find the interval in which the function $f(x) = 2x^3 - 3x^2 - 36x + 7$ is strictly increasing:

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

(B) $(-2, 3)$

(C) $(-\infty, 3)$

(D) $(-2, \infty)$

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10. Find the area of the region bounded by the curve $y^2 = x$ and the line $x = 4$:

(A) $\frac{32}{3}$

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

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

(D) 16
