

CUET 2026 May 21 Mathematics Shift 2

Question Paper (Memory-Based)

Conducted by National Testing Agency (NTA)



General Instructions

- (The examination will be conducted in Computer-Based Test (CBT) mode.
- (Each question carries +5 marks for correct answer and -1 mark for wrong answer.
- (The total number of questions are 50.
- (Duration of the exam is 1 hour (60 minutes).

1. Find the shortest distance between the two skew lines whose vector equations are given by:

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

$$\vec{r} = (4\hat{i} + 5\hat{j} + 6\hat{k}) + \mu(2\hat{i} + 3\hat{j} + \hat{k})$$

- (A) $3\sqrt{19}$
- (B) 0
- (C) 9
- (D) $\sqrt{151}$

2. Evaluate the definite integral using standard definite integral properties:

$$\int_0^{\frac{\pi}{2}} \frac{\sin^5 x}{\sin^5 x + \cos^5 x} dx$$

- (A) $\frac{\pi}{4}$
- (B) $\frac{\pi}{2}$
- (C) π
- (D) 0

3. If A is a skew-symmetric matrix of order 5×5 , what is the value of its determinant $|A|$?

- (A) 0
 - (B) 1
 - (C) -1
 - (D) 5
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4. Two independent events A and B have individual probabilities of occurring given by $P(A) = 0.4$ and $P(B) = 0.5$. Find the probability that at least one of these two events occurs.

- (A) 0.70
 - (B) 0.90
 - (C) 0.20
 - (D) 0.30
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5. Find the general solution of the following homogeneous differential equation:

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

- (A) $y^2 = 2x^2 \ln|x| + Cx^2$
 - (B) $y = x \ln|x| + C$
 - (C) $y^2 = x^2 + C$
 - (D) $y = e^x + Cx$
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6. Find the angle θ between the line $\frac{x-1}{1} = \frac{y+2}{-2} = \frac{z-3}{2}$ and the plane $2x - y + 2z = 7$.

- (A) $\sin^{-1}\left(\frac{8}{9}\right)$
 - (B) $\cos^{-1}\left(\frac{8}{9}\right)$
 - (C) $\frac{\pi}{2}$
 - (D) $\sin^{-1}\left(\frac{2}{3}\right)$
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7. Let a relation R be defined on the set of all natural numbers $\mathbb{N}$ by the rule: $(a, b) \in R$ if and only if $a + b$ is an even number. This relation R is classified as an:

- (A) Equivalence Relation
 - (B) Symmetric but not Transitive Relation
 - (C) Reflexive but not Symmetric Relation
 - (D) Anti-symmetric Relation
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8. Find the total area of the bounded region enclosed between the parabola curve $y^2 = 8x$ and its vertical latus rectum boundary line.

- (A) $\frac{32}{3}$ square units
 - (B) $\frac{16}{3}$ square units
 - (C) 8 square units
 - (D) $\frac{64}{3}$ square units
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9. If the direction vectors of two straight lines are given by $\vec{m} = \hat{i} + \hat{j} + 0\hat{k}$ and $\vec{n} = \hat{i} + 0\hat{j} + \hat{k}$, calculate the value of $\cos \phi$ representing the acute angle between them.

- (A) $\frac{1}{2}$
 - (B) $\frac{\sqrt{3}}{2}$
 - (C) 0
 - (D) 1
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10. A pair of standard unbiased six-sided dice are rolled simultaneously. Given that the sum of the numbers showing is exactly 6, what is the conditional probability that one of the dice shows the number 2?

- (A) $\frac{2}{5}$
 - (B) $\frac{1}{5}$
 - (C) $\frac{1}{6}$
 - (D) $\frac{2}{36}$
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