

CUET 2026 May 19 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

$$A^3 - 6A^2 + 11A - 6I = O.$$

If

$$B = A^2 - 5A + 7I,$$

then find $\det(B)$ given that $\det(A) = 6$.

- (A) 1
- (B) 8
- (C) 27
- (D) 64

2. If

$$\begin{vmatrix} x+a & y & z \\ x & y+b & z \\ x & y & z+c \end{vmatrix} = abc,$$

where $a, b, c \neq 0$, then find the value of

$$\frac{x}{a} + \frac{y}{b} + \frac{z}{c}.$$

- (A) 0
(B) 1
(C) 2
(D) 3

3. If

$$y = \left(\frac{x+1}{x-1} \right)^x,$$

then find $\frac{dy}{dx}$.

- (A) $y \left[\ln \left(\frac{x+1}{x-1} \right) - \frac{2x}{x^2-1} \right]$
 (B) $y \left[\ln \left(\frac{x+1}{x-1} \right) + \frac{2x}{x^2-1} \right]$
 (C) $y [\ln(x+1) - \ln(x-1)]$
 (D) $\frac{2y}{x^2-1}$

4. Evaluate:

$$\int \frac{x^2+1}{x^4+1} dx$$

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

5. Let

$$\vec{a} = 2\hat{i} - \hat{j} + \hat{k}, \quad \vec{b} = \hat{i} + 2\hat{j} - \hat{k},$$

and

$$\vec{c} = \lambda\hat{i} + \mu\hat{j} + 3\hat{k}.$$

If

$$[\vec{a} \ \vec{b} \ \vec{c}] = 0$$

and

$$\vec{c} \cdot (\vec{a} + \vec{b}) = 10,$$

then find the value of $\lambda + \mu$.

- (A) 1
 - (B) 2
 - (C) 3
 - (D) 4
-

6. Find the equation of the plane which passes through the point

$$(1, -2, 3),$$

contains the line of intersection of the planes

$$x + y + z = 1$$

and

$$2x - y + 3z = 4,$$

and is perpendicular to the plane

$$x - 2y + 2z + 5 = 0.$$

- (A) $5x - y + z - 10 = 0$
 - (B) $x + y + z - 1 = 0$
 - (C) $2x - y + 3z - 4 = 0$
 - (D) $3x + y - z + 2 = 0$
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7. Let A and B be two 3×3 matrices such that

$$A^2 - 4A + 3I = O$$

and

$$B = A^{-1} + 2A.$$

Find the determinant of B if $\det(A) = 3$.

- (A) 9
- (B) 27

(C) 81

(D) 3

8. If

$$f(x) = \left(\frac{1 + \sin x}{1 - \sin x} \right)^{\tan x},$$

then find

$$\lim_{x \rightarrow 0} \frac{\ln f(x)}{x^2}.$$

(A) 1

(B) 2

(C) 4

(D) 0

9. If

$$\begin{vmatrix} x+a & y & z \\ x & y+b & z \\ x & y & z+c \end{vmatrix} = 2abc,$$

where $a, b, c \neq 0$, then find the value of

$$\frac{x}{a} + \frac{y}{b} + \frac{z}{c}.$$

(A) 0

(B) 1

(C) 2

(D) 3

10. If

$$y = (x^{\sin x})^{\tan x},$$

then find

$$\frac{dy}{dx}.$$

(A)

$$y \left[\sec^2 x \sin x \ln x + \tan x \cos x \ln x + \frac{\tan x \sin x}{x} \right]$$

(B)

$$y [\cos x + \sin x]$$

(C)

$$y \tan x$$

(D)

$$x^{\sin x}$$