

CUET Mathematics Test - Set 2

Chapter: Section B2: Algebra (Matrices and Determinants)

General Instructions

1. Total Questions: **15**
2. Duration: **60 Minutes**
3. All questions are compulsory.
4. Each question carries **5 marks**.
5. For each correct answer: **+5 marks**.
6. For each incorrect answer: **-1 mark**.
7. No negative marking for unanswered questions.
8. Use of calculator or electronic devices is strictly prohibited.
9. Choose the most appropriate answer from the given options.

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1. If A is a square matrix such that $A^2 = A$, then $(I + A)^3 - 7A$ is equal to:
(A) A
(B) $I - A$
(C) I
(D) $3A$
2. If $A = \begin{bmatrix} 0 & 2 \\ 3 & -4 \end{bmatrix}$ and $kA = \begin{bmatrix} 0 & 3a \\ 2b & 24 \end{bmatrix}$, then the values of k, a, b are respectively:
(A) $-6, -4, -9$
(B) $-6, -12, -18$
(C) $-6, 4, 9$
(D) $-6, -4, 9$
3. The number of all possible matrices of order 2×3 with each entry 0 or 1 is:
(A) 6
(B) 12
(C) 64
(D) 32
4. If A and B are symmetric matrices of the same order, then $AB - BA$ is a:
(A) Skew-symmetric matrix
(B) Symmetric matrix
(C) Zero matrix
(D) Identity matrix
5. If $A = \begin{bmatrix} \alpha & 0 \\ 1 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 0 \\ 5 & 1 \end{bmatrix}$, then the value of α for which $A^2 = B$ is:
(A) 1
(B) -1
(C) 4
(D) No real values
6. If the determinant $\begin{vmatrix} x & 2 \\ 18 & x \end{vmatrix} = \begin{vmatrix} 6 & 2 \\ 18 & 6 \end{vmatrix}$, then x is equal to:
(A) 6
(B) ± 6
(C) -6
(D) 0
7. If A is an invertible matrix of order 2, then $\det(A^{-1})$ is equal to:
(A) $\det(A)$
(B) $1/\det(A)$
(C) 1
(D) 0
8. Let A be a non-singular square matrix of order 3×3 . Then $|\text{adj}A|$ is equal to:
(A) $|A|$
(B) $|A|^2$
(C) $|A|^3$
(D) $3|A|$
9. If $A = \begin{bmatrix} 2 & \lambda & -3 \\ 0 & 2 & 5 \\ 1 & 1 & 3 \end{bmatrix}$ is a singular matrix, then the value of λ is:
(A) -8

- (B) 10
(C) -10
(D) 8
10. If $A = \begin{bmatrix} 1 & 2 \\ 2 & 1 \end{bmatrix}$, then $\text{adj}A$ is:
- (A) $\begin{bmatrix} 1 & -2 \\ -2 & 1 \end{bmatrix}$
(B) $\begin{bmatrix} 2 & 1 \\ 1 & 2 \end{bmatrix}$
(C) $\begin{bmatrix} 1 & -2 \\ 2 & 1 \end{bmatrix}$
(D) $\begin{bmatrix} -1 & 2 \\ 2 & -1 \end{bmatrix}$
11. For what value of x is the matrix $A = \begin{bmatrix} 1-x & 2 \\ 3 & 4 \end{bmatrix}$ singular?
- (A) 1
(B) 2
(C) -0.5
(D) 2.5
12. If A is a square matrix of order 3 and $|A| = -2$, then $|A \cdot \text{adj}A|$ is:
- (A) -8
(B) 4
(C) -2
(D) 8
13. If A is a matrix of order $m \times n$ and B is a matrix such that AB^T and $B^T A$ are both defined, then the order of matrix B is:
- (A) $m \times n$
(B) $n \times m$
(C) $n \times n$
(D) $m \times m$
14. If $A = \begin{bmatrix} 5 & x \\ y & 0 \end{bmatrix}$ and $A = A^T$, then:
- (A) $x = 0, y = 5$
(B) $x = y$
(C) $x + y = 5$
(D) $x = -y$
15. The inverse of a symmetric matrix is:
- (A) Symmetric
(B) Skew-symmetric
(C) Diagonal
(D) None of these

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