CUET Mathematics Test - Set 15

Chapter: Algebra - Determinants (Intermediate)

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.

1. If A is a 3×3 matrix and $|3A| = k|A|$, then the value of k is:
   (A) 3
   (B) 9
   (C) 27
   (D) 81

2. If A and B are square matrices of order 3 such that $|A| = -1$ and $|B| = 3$, then the value of $|3AB|$ is:
   (A) -9
   (B) -81
   (C) -27
   (D) 81

3. Let A be a skew-symmetric matrix of order n. If n is odd, then $|A|$ is:
   (A) 1
   (B) -1
   (C) 0
   (D) n

4. If $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$, then the value of $|A \cdot adjA|$ is:
   (A) -2
   (B) 4
   (C) -4
   (D) 2

5. The points $(a, 0), (0, b)$ and $(1, 1)$ are collinear if:
   (A) $1/a + 1/b = 1$
   (B) $1/a - 1/b = 1$
   (C) $a + b = 1$
   (D) $ab = 1$

6. If $A = [a_{ij}]$ is a 3×3 matrix and C_{ij} is the cofactor of a_{ij}, then the value of $a_{11}C_{31} + a_{12}C_{32} + a_{13}C_{33}$ is:
   (A) $|A|$
   (B) 0
   (C) 1
   (D) $-|A|$

7. If A is a non-singular matrix of order 3 such that $A^2 = I$, then $|adjA|$ is:
   (A) 1
   (B) -1
   (C) 0
   (D) ± 1

8. Let $\Delta = \begin{vmatrix} 1 & 1 & 1 \\ 1 & 1+x & 1 \\ 1 & 1 & 1+y \end{vmatrix}$. Then Δ is equal to:
   (A) $1 + x + y$
   (B) xy
   (C) $x + y$
   (D) 1

9. If the system of equations $2x + 3y = 5$ and $4x + ky = 10$ has infinitely many solutions, then k is:

(A) 3
(B) 6
(C) 0
(D) 9

10. If A is a square matrix of order 3 and $|A| = 4$, then $|adj(2A)|$ is:
(A) 16
(B) 64
(C) 256
(D) 1024

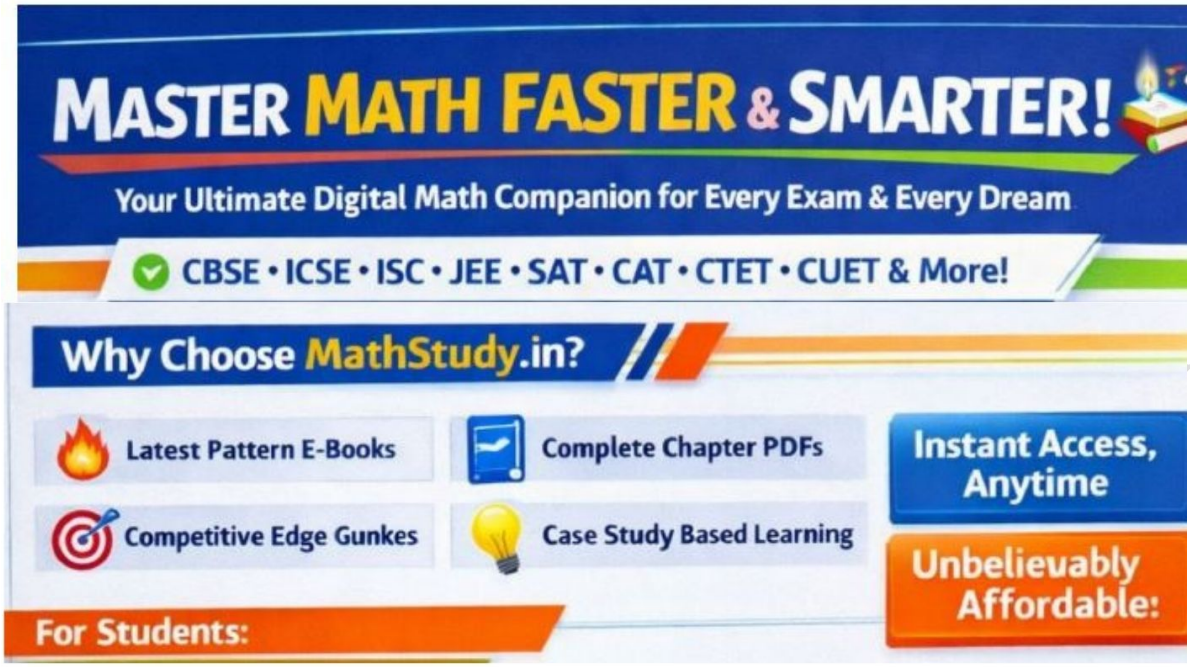
11. The maximum value of $\begin{vmatrix} 1 & 1 & 1 \\ 1 & 1+\sin\theta & 1 \\ 1 & 1 & 1+\cos\theta \end{vmatrix}$ is:
(A) 1
(B) 1/2
(C) 2
(D) $\sqrt{2}$

12. If $A = \begin{bmatrix} 2 & 3 \\ 5 & -2 \end{bmatrix}$, then A^{-1} is equal to:
(A) $\frac{1}{19}A$
(B) $-\frac{1}{19}A$
(C) A
(D) $19A$

13. If A and B are square matrices of order n such that $B = kA$, then $|B|/|A|$ is:
(A) k
(B) k^2
(C) k^n
(D) nk

14. If $\begin{vmatrix} x-2 & -3 \\ 3x & 2x \end{vmatrix} = 3$, then the value of x is:
(A) 1/2
(B) 3/2
(C) 1/2 or -3
(D) 3/2 or -1

15. If $A = \begin{bmatrix} 5 & 10 \\ 3 & -2 \end{bmatrix}$, then $|adj(adjA)|$ is:
(A) -40
(B) 40
(C) 1600
(D) -1600



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