Topic: Chap 4 (Determinants)

Important Problems for Practice

For 1 mark

Multiple Choice Question(MCQ)

Write the correct option in the following questions:-

1. If $\begin{vmatrix} x & 2 \\ 18 & x \end{vmatrix} = \begin{vmatrix} 6 & 2 \\ 18 & 6 \end{vmatrix}$ then x is equal to

   (A) 6 (B) ± 6 (C) – 6 (D) 0

2. If $\begin{vmatrix} 2x & 5 \\ 8 & x \end{vmatrix} = \begin{vmatrix} 6 & -2 \\ 7 & 3 \end{vmatrix}$ then x is equal to

   (A) 3 (B) ± 3 (C) ± 6 (D) 6

3. Let A be a square matrix of order 3 × 3, then | kA| is equal to

   (A) k| A | (B) k^2 | A | (C) k^3 | A | (D) 3k | A |

4. Let A = $\begin{bmatrix} 2 & 3 & 0 \\ 1 & -2 & 1 \\ 2 & 2 & 0 \end{bmatrix}$ then |2A| is equal to

   (A) -16 (B) 16 (C) 4 (D) -4

5. Which of the following is correct
   (A) Determinant is a square matrix.
   (B) Determinant is a number associated to a matrix.
   (C) Determinant is a number associated to a square matrix.
   (D) None of these
6. If area of triangle is 35 square units with vertices (2, – 6), (5, 4) and (k, 4). Then k is
   (A) 12 (B) –2 (C) –12, –2 (D) 12, –2
7. If area of triangle is 9 square units with vertices (-3, 0), (3, 0) and (0, k). Then k is
   (A) 9 (B) 3 (C) –9 (D) 6
8. If A and B are square matrices, each of order 2 such that |A| = 3 and |B| = - 2, then the value of |3AB| is
   (A) -18 (B) 18 (C) –54 (D) 54
9. If A and B are invertible matrices of order 3, $|A| = 2$ and $|(AB)^{-1}| = -\frac{1}{6}$. Then $|B| =$

   (A) 9 (B) -3 (C) –9 (D) 6

10. Let A be a nonsingular square matrix of order 3 × 3. Then |adj A| is equal to

(A) | A | (B) | A |^2 (C) | A |^3 (D) 3|A|

11. If A is a square matrix of order 3 such that |adj A|= 64, then |A|=

(A) 8 (B) -8 (C) ± 8 (D) None of these

12. A is a square matrix of order 3 and $|A|$ =7. Then the value of |adj A| is

(A) 21 (B) 49 (C) 63 (D) None of these

13.If A is an invertible matrix of order 2, then det (A^{-1}) is equal to

(A) det (A) (B) $\frac{1}{det(A)}$ (C) 1 (D) 0

14.If x, y, z are nonzero real numbers, then the inverse of matrix $A = \begin{bmatrix} x & 0 & 0 \\ 0 & y & 0 \\ 0 & 0 & z \end{bmatrix}$ is

(A) $\begin{bmatrix} x^{-1} & 0 & 0 \\ 0 & y^{-1} & 0 \\ 0 & 0 & z^{-1} \end{bmatrix}$ (B) $\frac{1}{xyz}\begin{bmatrix} x^{-1} & 0 & 0 \\ 0 & y^{-1} & 0 \\ 0 & 0 & z^{-1} \end{bmatrix}$

(C)) $\frac{1}{xyz}\begin{bmatrix} x & 0 & 0 \\ 0 & y & 0 \\ 0 & 0 & z \end{bmatrix}$ (D) $\frac{1}{xyz}\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$

15. Let $\Delta = \begin{vmatrix} Ax & x^2 & 1 \\ By & y^2 & 1 \\ Cz & z^2 & 1 \end{vmatrix}$ and $\Delta_1 = \begin{vmatrix} A & B & C \\ x & y & z \\ zy & zx & xy \end{vmatrix}$, then

(A) $\Delta_1 = -\Delta$ (B) (A) $\Delta \neq \Delta_1$ (C) $\Delta - \Delta_1 = 0$ (D) None of these

16. Let $A = \begin{bmatrix} 1 & \sin\theta & 1 \\ -\sin\theta & 1 & \sin\theta \\ -1 & -\sin\theta & 1 \end{bmatrix}$, where $0 \leq \theta \leq 2\pi$. Then

(A) Det(A) = 0 (B) Det(A) ∈ (2, ∞)

(C) Det(A) ∈ (2, 4) (D) Det(A) ∈ [2, 4]

17. The value of determinant $\begin{vmatrix} a-b & b+c & a \\ b-a & c+a & b \\ c-a & a+b & c \end{vmatrix}$

(A) $a^3 + b^3 + c^3$ (B) 3abc

(C) $a^3 + b^3 + c^3 - 3abc$ (D) None of these

18. The maximum value of $\begin{vmatrix} 1 & 1 & 1 \\ 1 & 1+\sin\theta & 1 \\ 1+\cos\theta & 1 & 1 \end{vmatrix}$ is (θ is real number)

(A) $\frac{1}{2}$ (B)$\frac{\sqrt{3}}{2}$ (C) $\sqrt{2}$ (D) $\frac{2\sqrt{3}}{4}$

19.The number of distinct real roots of $\begin{vmatrix} \sin x & \cos x & \cos x \\ \cos x & \sin x & \cos x \\ \cos x & \cos x & \sin x \end{vmatrix} = 0$ in the interval $-\frac{\pi}{4} \leq x \leq \frac{\pi}{4}$ is

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

20. If x, y ∈ R, then the determinant $\begin{vmatrix} \cos x & -\sin x & 1 \\ \sin x & \cos x & 1 \\ \cos(x+y) & -\sin(x+y) & 0 \end{vmatrix}$ lies in the interval

(A) $[-\sqrt{2}, \sqrt{2}]$ (B) [–1, 1]

(C) $[-\sqrt{2}, 1]$ (D) $[-1, -\sqrt{2}]$

21. If $f(x) = \begin{vmatrix} 0 & x-a & x-b \\ x+a & 0 & x-c \\ x+b & x+c & 0 \end{vmatrix}$, then

(A) $f(a) = 0$ (B) $f(b) = 0$

(C) $f(0) = 0$ (D) $f(1) = 0$

22. The value of the determinant $\begin{vmatrix} x & x+y & x+2y \\ x+2y & x & x+y \\ x+y & x+2y & x \end{vmatrix}$ is

(A) $9x^2(x+y)$ (B) $9y^2(x+y)$

(C) $3y^2(x+y)$ (D) $7x^2(x+y)$

23. If x, y, z are all different from zero and $\begin{vmatrix} 1+x & 1 & 1 \\ 1 & 1+y & 1 \\ 1 & 1 & 1+z \end{vmatrix} = 0$, then value of $x^{-1} + y^{-1} + z^{-1}$ is

(A) xyz (B) $x^{-1}y^{-1}z^{-1}$

(C) $-x-y-z$ (D) -1

24. There are two values of a which makes determinant, Δ = $\begin{vmatrix} 1 & -2 & 5 \\ 2 & a & -1 \\ 0 & 4 & 2a \end{vmatrix}$, then sum of these number is

(A) 4 (B) 5 (C) – 4 (D) 9

25. If A and B are invertible matrices, then which of the following is not correct?

(A) adj A = |A|. A^{-1} (B) $\det(A)^{-1} = [det\ (A)]^{-1}$

(C) $(AB)^{-1} = B^{-1}\ A^{-1}$ (D) $(A\ +\ B)^{-1} = B^{-1}\ +\ A^{-1}$

Answer Key

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
B	C	C	B	C	D	B	C	B	B	C	B	B	A	C	D	C	A	C	A	C	B	D	C	D

For online MCQ test use below link:-

https://docs.google.com/forms/d/e/1FAIpQLSfOJur3Kx4oh86O1YY2Ejr5-camu2CoRy_wh06DPPdtf2KrwQ/viewform?vc=0&c=0&w=1