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Practice Set 2

Mathematics

DETERMINANT AND MATRICES

Topics :

1. Determinant and its value up to 3rd order (Without properties). 2. Concept of a Matrix. 3. Types of Matrices. 4. Addition, Subtraction and multiplication by scalar of matrices. 5. Product of two matrices. 6. Adjoint and Inverse of a matrix of order 2×2 . 7. Solution of Simultaneous linear equations of two variables

DDCE final exam weightage of this topic : 4 Question (8 Marks)

**Total Practice sets
of this topic :**

$2 \text{ (sets) } \times 30 \text{ (questions) } = 60 \text{ Questions}$

**Total Practice tests
of this topic :**

$2 \text{ (exams) } \times 20 \text{ (questions) } = 40 \text{ Questions}$

**Offline / Online
during lecture :**

$4 \text{ (lectures) } \times 50 \text{ (Questions) } = 200 \text{ Question}$

Total 300 Questions to
practice this topic



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1. Determinant
2. Matrices

1. Find the value of $\begin{vmatrix} e^{2x} & e^x \\ 1 & e^{-x} \end{vmatrix}$

- a. 1
- b. e^x
- c. 0
- d. e

2. $\begin{vmatrix} \log_6 2 & -1 \\ \log_6 3 & 1 \end{vmatrix} = \text{_____}$

- a. 1
- b. -1
- c. 0
- d. 2

3. If $\begin{vmatrix} x & -2 \\ 2 & 1 \end{vmatrix} = 2$ then find the value of x

- a. 2
- b. -2
- c. 4
- d. -4

4. The determinant of Zero matrix is:

- a. 1
- b. 0
- c. -1
- d. Not define

5. Principal diagonal elements of $\begin{bmatrix} 2 & 6 \\ 5 & 3 \end{bmatrix}$ is:

- a. (2,3)
- b. (5,6)
- c. (2,5)
- d. (6,3)

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6. If $A = \begin{bmatrix} 4 & 3 \\ 2 & 6 \end{bmatrix}$, and $B = \begin{bmatrix} -3 & -1 \\ 5 & 5 \end{bmatrix}$, then find AB

- a. $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$
- b. $\begin{bmatrix} -3 & -11 \\ -24 & -28 \end{bmatrix}$
- c. $\begin{bmatrix} 27 & 19 \\ 36 & 32 \end{bmatrix}$
- d. $\begin{bmatrix} 3 & 11 \\ 24 & 28 \end{bmatrix}$

7. If $\begin{vmatrix} x & 1 & -2 \\ 4 & 4 & 2 \\ 1 & 3 & 1 \end{vmatrix} = 0$ then $x =$ _____.

- a. -9
- b. 9
- c. 1
- d. 10

8. If $\begin{vmatrix} 2x & 6 \\ 6 & 2x \end{vmatrix} = 0$ then find the value of x .

- a. ± 2
- b. 3
- c. ± 3
- d. 1

9. If $A = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ then $A^2 =$

- a. $\begin{bmatrix} 0 & 1 \\ 0 & 1 \end{bmatrix}$
- b. $\begin{bmatrix} 1 & 1 \\ 1 & 1 \end{bmatrix}$
- c. $\begin{bmatrix} 0 & 0 \\ 0 & 0 \end{bmatrix}$
- d. $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$

10. The matrix $[1 \ -2 \ 3 \ 4]$ is known as

- a. Column Matrix
- b. Singular Matrix
- c. Row Matrix
- d. Non-singular Matrix

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11. If $A = \begin{bmatrix} 1 & 3 & 2 \end{bmatrix}$ and $B = \begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix}$ then $AB =$

- a. $[13]$
- b. Identity matrix
- c. $\begin{bmatrix} 1 & 3 & 2 \\ 2 & 6 & 4 \\ 3 & 3 & 2 \end{bmatrix}$
- d. Not possible

12. If order of matrix A is 3×4 and order of (AB) is 3×1 then order of matrix B is

- a. 3×4
- b. 4×1
- c. 4×3
- d. 1×4

13. If $A = \begin{bmatrix} 20 & 40 \\ 10 & 30 \end{bmatrix}$ then $2A - \frac{1}{10}A =$

- a. $\begin{bmatrix} 38 & 76 \\ 19 & 57 \end{bmatrix}$
- b. $\begin{bmatrix} 20 & 40 \\ 10 & 30 \end{bmatrix}$
- c. $\begin{bmatrix} -20 & -40 \\ -10 & -30 \end{bmatrix}$
- d. $\begin{bmatrix} -38 & 76 \\ 19 & -57 \end{bmatrix}$

14. If $\begin{bmatrix} x & 2 \\ y & 3 \end{bmatrix} \begin{bmatrix} 3 \\ 2 \end{bmatrix} = \begin{bmatrix} 12 \\ 12 \end{bmatrix}$ then $y =$

- a. 2
- b. 0
- c. 1
- d. -2

15. If $A = \begin{bmatrix} 2 & -4 & 1 \\ 1 & 1 & 5 \\ 7 & 2 & 3 \end{bmatrix}$ then $AI_3 =$

- a. A^{-1}
- b. A
- c. 0
- d. 1

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16. If $A = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$, then $\text{adj } A =$ _____.

- a. $\begin{bmatrix} d & b \\ c & a \end{bmatrix}$
- b. $\begin{bmatrix} a & c \\ b & d \end{bmatrix}$
- c. $\begin{bmatrix} -a & c \\ b & -d \end{bmatrix}$
- d. $\begin{bmatrix} d & -b \\ -c & a \end{bmatrix}$

17. If $A = \begin{bmatrix} 3 & 4 \\ 2 & -1 \end{bmatrix}$, then $\text{adj } A =$ _____.

- a. $\begin{bmatrix} -1 & 2 \\ 4 & 3 \end{bmatrix}$
- b. $\begin{bmatrix} -1 & -4 \\ -2 & 3 \end{bmatrix}$
- c. $\begin{bmatrix} -3 & 2 \\ 4 & 1 \end{bmatrix}$
- d. $\begin{bmatrix} -1 & 4 \\ 2 & 3 \end{bmatrix}$

18. If $A = \begin{bmatrix} 4 & -3 \\ 7 & -2 \end{bmatrix}$, then $\text{adj } A =$ _____.

- a. $\begin{bmatrix} 4 & -3 \\ -7 & -2 \end{bmatrix}$
- b. $\begin{bmatrix} -2 & 3 \\ -7 & 4 \end{bmatrix}$
- c. $\begin{bmatrix} -2 & -3 \\ -7 & 4 \end{bmatrix}$
- d. $\begin{bmatrix} -4 & 7 \\ -3 & 2 \end{bmatrix}$

19. If $A = \begin{bmatrix} -8 & 10 \\ -4 & 5 \end{bmatrix}$, then $A^{-1} =$ _____.

- a. $\begin{bmatrix} 5 & -4 \\ 10 & 8 \end{bmatrix}$
- b. $\begin{bmatrix} -8 & 10 \\ 4 & 5 \end{bmatrix}$
- c. $\begin{bmatrix} 5 & -10 \\ -4 & 8 \end{bmatrix}$
- d. A^{-1} does not exist

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20. If $A = \begin{bmatrix} 2 & 3 \\ 1 & 4 \end{bmatrix}$, then $A^{-1} =$ _____.

- a. $\frac{1}{5} \begin{bmatrix} 4 & -3 \\ -1 & 2 \end{bmatrix}$
- b. $\frac{1}{5} \begin{bmatrix} 2 & -3 \\ -1 & 4 \end{bmatrix}$
- c. $\frac{1}{5} \begin{bmatrix} -2 & 1 \\ 3 & -4 \end{bmatrix}$
- d. $\frac{1}{5} \begin{bmatrix} 4 & 3 \\ 1 & 2 \end{bmatrix}$

21. Which of the following matrices is singular (i.e., does not have an inverse)?

- a. $\begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$
- b. $\begin{bmatrix} 2 & 4 \\ 1 & 2 \end{bmatrix}$
- c. $\begin{bmatrix} 5 & -3 \\ 2 & 7 \end{bmatrix}$
- d. $\begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$

22. If $A = \begin{bmatrix} 1 & 3 \\ 6 & 5 \end{bmatrix}$ and $B = \begin{bmatrix} 5 & -2 \\ 4 & 3 \end{bmatrix}$, then $(A+B)^{-1} =$ _____.

- a. $\frac{1}{38} \begin{bmatrix} 6 & -1 \\ -10 & 8 \end{bmatrix}$
- b. $\frac{1}{38} \begin{bmatrix} -6 & 1 \\ 10 & -8 \end{bmatrix}$
- c. $\frac{1}{38} \begin{bmatrix} 8 & -1 \\ -10 & 6 \end{bmatrix}$
- d. $\frac{1}{38} \begin{bmatrix} 8 & -1 \\ -10 & 6 \end{bmatrix}$

23. If $A = \begin{bmatrix} 6 & 3 \\ 8 & 5 \end{bmatrix}$ and $B = \begin{bmatrix} 5 & -2 \\ 4 & 3 \end{bmatrix}$, then $(A-B)^{-1} =$ _____.

- a. $\frac{1}{18} \begin{bmatrix} -2 & 5 \\ 4 & -1 \end{bmatrix}$
- b. $\frac{1}{18} \begin{bmatrix} 2 & -5 \\ -4 & 1 \end{bmatrix}$
- c. $\frac{-1}{18} \begin{bmatrix} 2 & 5 \\ 4 & 1 \end{bmatrix}$
- d. $\frac{-1}{18} \begin{bmatrix} -2 & 5 \\ 4 & -1 \end{bmatrix}$

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24. If $AB = I$ then matrix $B =$ _____.

- a. $\text{adj}A$
- b. A^T
- c. A^{-1}
- d. I

25. If $A = \begin{bmatrix} 1 & 3 & 2 \\ 4 & 2 & 1 \\ 2 & 5 & 3 \end{bmatrix}$ then $|A| =$ _____.

- a. -5
- b. 5
- c. 3
- d. -3

26. If $A = \begin{bmatrix} 2 & 4 & 1 \\ 3 & 1 & 5 \\ 6 & 2 & 3 \end{bmatrix}$ then find $|A| =$ _____.

- a. -10
- b. 70
- c. 60
- d. 15

27. For square matrix A , if $A^{-1} = \text{adj}A$ then $|A| =$ _____.

- a. 1
- b. 0
- c. -1
- d. Does not exist

28. If A^{-1} exists, then which of the following is always true?

- a. A is singular
- b. $\det(A) \neq 0$
- c. $A^T = A^{-1}$
- d. $A^2 = I$

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29. If the inverse of matrix $A = \begin{bmatrix} 2 & 1 \\ 4 & 3 \end{bmatrix}$ is given by $A^{-1} = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$ then find the value of a and d.

- a. $a = -1.5$ and $d = -1$
- b. $a = 1.5$ and $d = 1$
- c. $a = 1.5$ and $d = -1$
- d. $a = 1$ and $d = 1.5$

30. Which of the following matrices has no inverse?

- a. $\begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$
- b. $\begin{bmatrix} -2 & -4 \\ 1 & 2 \end{bmatrix}$
- c. $\begin{bmatrix} 5 & -2 \\ 2 & 3 \end{bmatrix}$
- d. $\begin{bmatrix} 1 & 0 \\ -1 & 0 \end{bmatrix}$

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