MATHS

BOOKS - OSWAAL PUBLICATION MATHS (KANNADA ENGLISH)

MATRICES

Matrices And Operations Very Short Answer Type Questions

1. Define a diagonal matrix.

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2. Construct a 2×2 matrix $A = |a_{ij}|$ whose elements are given by $a_{ij} = 2i + j$.

3. Construct a 2×2 matrix A = $\left[a_{ij}\right]$ where $a_{ij} = \dfrac{i - j}{2}$.

4. Construct a 2×3 matrix $A = \left[a_{ij}\right]$, whose elements are given by $a_{ij} = \dfrac{1}{2}|2i - 3j|$.

5. Define a scalar matrix.

6. Construct 3×3 matrix whose elements are given by :

$$a_{ij} = i - j$$

7. What is the number of the possible square matrices for order 3 with each entry 0 or 1.

8. A = $\begin{bmatrix} 4 & 3 \\ 2 & 1 \end{bmatrix}$ Find A+A'.

9. If $[xy4z + 6x + y] = [8w06]$, write the value of $(x + y + z)$.

10. The elements a_{ij} of a 3×3 matrix are given by $a_{ij} = \frac{1}{2}| - 3i + j|$. Write the value of element a_{32}

11. If $(2x4)(x - 8) = 0$, find the positive value of x

12. If $[a + 43b8 - 6] = [2a + 2b + 28a - 8b]$, write the value of $a - 2b$.

13. If $2\begin{bmatrix} 3 & 4 \\ 5 & x \end{bmatrix} + \begin{bmatrix} 1 & y \\ 0 & 1 \end{bmatrix} = \begin{bmatrix} 7 & 0 \\ 10 & 5 \end{bmatrix}$ then

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14. Solve the following matrix equation for

$x: , \, [x1][10 - 20] - O.$

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15. If A is a square matrix such that $A^2 = A$, then write the value of $7A - (I + A)^3$, where I is the identity matrix.

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16. If $\begin{bmatrix} x - y & z \\ 2x - y & w \end{bmatrix} = \begin{bmatrix} -1 & 4 \\ 0 & 5 \end{bmatrix}$ Then find the value of $x + y$

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17. Find the values of x and y, if

$$2\begin{bmatrix} 1 & 3 \\ 0 & x \end{bmatrix} + \begin{bmatrix} y & 0 \\ 1 & 2 \end{bmatrix} = \begin{bmatrix} 5 & 6 \\ 1 & 8 \end{bmatrix}.$$

18. If $\begin{bmatrix} x-y & 2y \\ 2y+z & x+y \end{bmatrix} = \begin{bmatrix} 1 & 4 \\ 9 & 5 \end{bmatrix}$ then write the value of $(x + y + z)$.

19. Find the value of a if $[a - b2a + c2a - b3c + d] = [-15013]$

20. If $[9 - 14 - 213] = A + [12 - 1049]$, then find the matrix A.

21. If $[2357] [1 - 3 - 24] = [-46 - 9x]$, write the value of x

22. Simplify:

$$\cos\theta \begin{bmatrix} \cos\theta & \sin\theta \\ -\sin\theta & \cos\theta \end{bmatrix} + \sin\theta \begin{bmatrix} \sin\theta & -\cos\theta \\ \cos\theta & \sin\theta \end{bmatrix}$$

23. Find the value of $x + y$ from the following equation:

$$2\begin{bmatrix} x & 5 \\ 7y & -3 \end{bmatrix} + \begin{bmatrix} 3 & -4 \\ 1 & 2 \end{bmatrix} = \begin{bmatrix} 7 & 6 \\ 15 & -4 \end{bmatrix}$$

24. if $A' = \begin{bmatrix} 3 & 4 \\ -1 & 2 \\ 0 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} -1 & 2 & 1 \\ 1 & 2 & 3 \end{bmatrix}$, then verify that

$(i)(A+B)' = A' + B' (ii)(A_B)' = A - B'$

25. If I is the identity matrix and A is a square matrix such that $A^2 = A$, then what is the value of $(I + A)^2 - 3A$?

26. if $x \begin{bmatrix} 2 \\ 3 \end{bmatrix} + Y \begin{bmatrix} -1 \\ 1 \end{bmatrix} = \begin{bmatrix} 10 \\ 5 \end{bmatrix}$, find the values of X x and y.

27. If $\begin{bmatrix} x & x - y \\ 2x + y & 7 \end{bmatrix} = \begin{bmatrix} 3 & 1 \\ 8 & 7 \end{bmatrix}$ write the value of y.

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28. For a 2×2 matrix $A = [a_{ij}]$ whose elements are given by $a_{ij} = \dfrac{i}{j}$, write the value of a_{12} .

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29. If a matrix has 5 elements, write all possible orders it can have.

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30. Write the values of $x - y + z$ from the following equation:

$$[x + y + zx + zy + z] = [957]$$

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31. Write the order of the product matrix : $[123]\,[2\ 3\ 4]$

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Matrices And Operations Short Answer Type Question I

1. If matrix $A = [1 - 1 - 11]$ and $A^2 = kA,$ then write the value of $k.$

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1. Find the values of x,y and z in the following matrixies :

$$\begin{bmatrix} x+y & 2 \\ 5+z & xy \end{bmatrix} = \begin{bmatrix} 5 & 2 \\ 5 & 8 \end{bmatrix}.$$

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2. Find the value of x and y in $\begin{bmatrix} x+2y & 2 \\ 4 & x+y \end{bmatrix} - \begin{bmatrix} 3 & 2 \\ 4 & 1 \end{bmatrix} = 0$ where 0 is a null matrix.

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3. Find the value of x and y : $\begin{bmatrix} x+y & 3 \\ x-y & -6 \end{bmatrix} = \begin{bmatrix} 2 & 3 \\ 4 & -6 \end{bmatrix}$

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4. If A= $\begin{pmatrix} 2 & 0 & 1 \\ 2 & 1 & 3 \\ 1 & -1 & 0 \end{pmatrix}$ then find the value of $A^2 - 3A + 2I$.

5. For the following matrices A and B, verify that (AB)'=B'A'.

$$A = \begin{bmatrix} 1 \\ -4 \\ 3 \end{bmatrix} \text{ and } B = \begin{bmatrix} -1 & 2 & 1 \end{bmatrix}$$

Matrices And Operations Long Answer Type Questions Ii

1. If A= $\begin{bmatrix} 1 & 1 & -1 \\ 2 & 0 & 2 \\ 3 & -1 & 2 \end{bmatrix}$, $B = \begin{bmatrix} 1 & 3 \\ 0 & 2 \\ -1 & 4 \end{bmatrix}$ and C = $\begin{bmatrix} 1 & 2 & 3 & -4 \\ 2 & 0 & -2 & 1 \end{bmatrix}$ then find A(BC) and (AB) C. Show that A(BC) = (AB) C.

2. If

$$A = \begin{bmatrix} 0 & 6 & 7 \\ -6 & 0 & 8 \\ 7 & -8 & 0 \end{bmatrix}, B = \begin{bmatrix} 0 & 1 & 1 \\ 1 & 0 & 2 \\ 1 & 2 & 0 \end{bmatrix} \text{ and } C = \begin{bmatrix} 2 \\ -2 \\ 3 \end{bmatrix}$$

Calculate AC, BC and (A+B)C. Also verify that (A+B)C=AC+BC.

3. If $A = \begin{bmatrix} 2 & 0 & 1 \\ 0 & -3 & 0 \\ 0 & 0 & 4 \end{bmatrix}$, verify $A^3 - 3A^2 - 10A + 24I = 0$

where 0 is zero matrix of order 3×3.

4. Verify (B+C) A =BA +CA if A = $\begin{bmatrix} 2 & 3 \\ 4 & -5 \end{bmatrix}$,B= $\begin{bmatrix} 3 & 8 \\ 11 & 21 \end{bmatrix}$ and C = $\begin{bmatrix} 7 & 13 \\ 5 & 19 \end{bmatrix}$.

5. यदि

$$A = \begin{bmatrix} 1 & 1 & -1 \\ 2 & 0 & 3 \\ 3 & -1 & 1 \end{bmatrix}, B = \begin{bmatrix} 1 & 3 \\ 0 & 2 \\ -1 & 4 \end{bmatrix} \quad C = \begin{bmatrix} 1 & 2 & 3 & -4 \\ 2 & 0 & -2 & 1 \end{bmatrix}$$

, तो A (BC) तथा (AB) C ज्ञात कीजिए और दिखलाइए कि (AB) C=A (BC) है।

6. If $A = [1233 - 21421]$, then show that $A^3 - 23A - 401 = 0$.

1. If A and B are two skew symmetric matrices of same order then AB is symmetric matrix if _____

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2. If the matrix $\begin{bmatrix} 5-x & 2y-8 \\ 2 & 3 \end{bmatrix}$ is symmetric then find the value of x and y.

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3. Write a 2×2 matrix which is both symmetric and skew-symmetric.

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4. For what value of k the matrix

$$\begin{bmatrix} 2k+3 & 4 & 5 \\ -4 & 0 & -6 \\ -5 & 6 & -2k-3 \end{bmatrix}$$ is a skew symmetric matrix ?

5. For what value of x, is the matrix

$$A = \begin{bmatrix} 0 & 1 & -2 \\ -1 & x & -3 \\ 2 & 3 & 0 \end{bmatrix}$$ a skew-symmetric matrix

Symmetric And Skew Symmetric Matrices Short Answer Type Questions Ii

1. Express the following matrix as the sum of a symmetric and a skew symmetric matrix and verify your result :
$$\begin{bmatrix} 3 & -2 & -4 \\ 3 & -2 & -5 \\ -1 & 1 & 2 \end{bmatrix}.$$

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2. Express matrix A=
$$\begin{bmatrix} 1 & 2 \\ 2 & -1 \end{bmatrix}$$
as the sum a symmetric and skew symmetric matrix.

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3. Express the matrix
$$\begin{bmatrix} 2 & 3 & 1 \\ 1 & -1 & 2 \\ 4 & 1 & 2 \end{bmatrix}$$
as the sum of a symmetric and a skew-symmetric matrix.

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4. For any square matrix A with real numbers, prove that $A + A'$ is a symmetric and $A - A'$ is a skew symmetric.

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1. Using elementary transformations, find the inverse of the matrix$\begin{bmatrix} 1 & 3 \\ 2 & 7 \end{bmatrix}$

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

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3. If A; B are invertible matrices of the same order; then show that

$$(AB)^{-1} = B^{-1}A^{-1}$$

4. By using the elementary transformation, find the inverse of the matrix, $A = \begin{bmatrix} 1 & 2 \\ 2 & -1 \end{bmatrix}$.

5. Using elementary row operations, find the inverse of the following matrix: (2513)

6. Find the inverse of $A = (3 - 1 - 41)$ using elementary transformations.

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7. Find the inverse of the following matrix using elementary transformations A= $\begin{bmatrix} 3 & 2 \\ 7 & 5 \end{bmatrix}$.

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Elementary Operations Or Transformation Of A Matrix Long Answer Type Questions Ii

1. $\begin{bmatrix} -1 & 1 & 2 \\ 1 & 2 & 3 \\ 3 & 1 & 1 \end{bmatrix}$

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2. Using elementary transformations, find the inverse of the matrix : $\begin{pmatrix} 2 & 0 & -1 \\ 5 & 1 & 0 \\ 0 & 1 & 3 \end{pmatrix}$

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3. Using elementary transformations, find the inverse of the matrix $\begin{pmatrix} 1 & 3 & -2 \\ -3 & 0 & -1 \\ 2 & 1 & 0 \end{pmatrix}$

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