

Model Question Paper
Matrices and Determinants - Part I

12th Standard

Maths

Reg.No. :

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I. Answer all the Questions.
 II. Use blue pen only.

Time : 00:45:00 Hrs

Total Marks : 68

5 x 1 = 5

Section-A

1) The rank of the matrix $\begin{pmatrix} 1 & -1 & 2 \\ 2 & -2 & 4 \\ 4 & -4 & 8 \end{pmatrix}$ is,
 (a) 1 (b) 2 (c) 3 (d) 4

2) The rank of the diagonal matrix $\begin{pmatrix} -1 & 0 & 0 & 0 & 0 \\ 0 & 2 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -4 & 0 \\ 0 & 0 & 0 & 0 & 0 \end{pmatrix}$ is
 (a) 0 (b) 2 (c) 3 (d) 5

3) If $A = (2 \ 0 \ 1)$, then the rank of AA^T is

(a) 1 (b) 2 (c) 3 (d) 0

4) If $A = \begin{pmatrix} 1 \\ 2 \\ 3 \end{pmatrix}$, then the rank of AA^T is,

(a) 3 (b) 0 (c) 1 (d) 2

5) If the rank of the matrix $\begin{pmatrix} \lambda & -1 & 0 \\ 0 & \lambda & -1 \\ -1 & 0 & \lambda \end{pmatrix}$ is 2, then λ is,

(a) 1 (b) 2 (c) 3 (d) any real number

Section-B

6) Find the rank of the following matrices: $\begin{bmatrix} 1 & 1 & -1 \\ 3 & -2 & 3 \\ 2 & -3 & 4 \end{bmatrix}$

7) Find the adjoint of the following matrices: $\begin{bmatrix} 3 & -1 \\ 2 & -4 \end{bmatrix}$

8) Solve the following non-homogeneous system of linear equations by determinant method: $3x + 2y = 5$; $x + 3y = 4$

Section-C

9) Find the adjoint of the matrix $A = \begin{bmatrix} 1 & 2 \\ 3 & -5 \end{bmatrix}$ and verify the result $A (adjA) = (adjA) A = |A| \cdot I$

10) Find the inverse of the following matrices: $\begin{bmatrix} 1 & 0 & 3 \\ 2 & 1 & -1 \\ 1 & -1 & 1 \end{bmatrix}$

11) Show that the adjoint of $A = \begin{bmatrix} -4 & -3 & -3 \\ 1 & 0 & 1 \\ 4 & 4 & 3 \end{bmatrix}$ is **A** itself.

12) For $A = \begin{bmatrix} -1 & 2 & -2 \\ 4 & -3 & 4 \\ 4 & -4 & 5 \end{bmatrix}$ show that $A = A^{-1}$

Section-D

13) Find the adjoint of the matrix $A = \begin{bmatrix} 3 & -3 & 4 \\ 2 & -3 & 4 \\ 0 & -1 & 1 \end{bmatrix}$ and verify the result $A (adjA) = (adjA) A = |A| \cdot I$

14) Find the inverse of the matrix $A = \begin{bmatrix} 3 & -3 & 4 \\ 2 & -3 & 4 \\ 0 & -1 & 1 \end{bmatrix}$ and verify that $A^3 = A^{-1}$

15) Show that the adjoint of $A = \begin{bmatrix} -1 & -2 & -2 \\ 2 & 1 & -2 \\ 2 & -2 & 1 \end{bmatrix}$ is $3A^T$

3 x 3 = 9

4 x 6 = 24

3 x 10 = 30