Application of Matrices and Determinants 2 MARKS TEST

12th Standard

Maths

Exam Time : 01:30:00 Hrs   Total Marks : 60

30 x 2 = 60

1) If A = $\begin{bmatrix} a & b \\ c & d \end{bmatrix}$ is non-singular, find A^{-1}.

2) If A is a non-singular matrix of odd order, prove that |adj A| is positive

3) Find a matrix A if adj(A) = $\begin{bmatrix} 7 & 7 & -7 \\ -1 & 11 & 7 \\ 11 & 5 & 7 \end{bmatrix}$.

4) If adj A = $\begin{bmatrix} -1 & 2 & 2 \\ 1 & 1 & 2 \\ 2 & 2 & 1 \end{bmatrix}$, find A^{-1}.

5) If A is symmetric, prove that then adj A is also symmetric.

6) Prove that $\begin{bmatrix} \cos\theta & -\sin\theta \\ \sin\theta & \cos\theta \end{bmatrix}$ is orthogonal

7) Find the adjoint of the following:
$\begin{bmatrix} -3 & 4 \\ 6 & 2 \end{bmatrix}$

8) Find the inverse (if it exists) of the following:
$\begin{bmatrix} -2 & 4 \\ 1 & -3 \end{bmatrix}$

9) If adj(A) = $\begin{bmatrix} 0 & -2 & 0 \\ 6 & 2 & -6 \\ -3 & 0 & 6 \end{bmatrix}$, find A^{-1}.

10) Reduce the matrix $\begin{bmatrix} 3 & -1 & 2 \\ -6 & 2 & 4 \\ -3 & 1 & 2 \end{bmatrix}$ to a row-echelon form.

11) Find the rank of the following matrices which are in row-echelon form :
$\begin{bmatrix} 2 & 0 & -7 \\ 0 & 3 & 1 \\ 0 & 0 & 1 \end{bmatrix}$

12) Find the rank of the matrix $\begin{bmatrix} 1 & 2 & 3 \\ 2 & 1 & 4 \\ 3 & 0 & 5 \end{bmatrix}$ by reducing it to a row-echelon form.

13) Find the rank of the following matrices by minor method:
$\begin{bmatrix} 2 & -4 \\ -1 & 2 \end{bmatrix}$

14) Find the rank of the following matrices by minor method:
$$\begin{bmatrix} -1 & 3 \\ 4 & -7 \\ 3 & -4 \end{bmatrix}$$

15) Find the rank of the following matrices by minor method:
$$\begin{bmatrix} 1 & -2 & -1 & 0 \\ 3 & -6 & -3 & 1 \end{bmatrix}$$

16) Find the rank of the following matrices by minor method:
$$\begin{bmatrix} 1 & -2 & 3 \\ 2 & 4 & -6 \\ 5 & 1 & -1 \end{bmatrix}$$

17) Find the rank of the following matrices by minor method:
$$\begin{bmatrix} 0 & 1 & 2 & 1 \\ 0 & 2 & 4 & 3 \\ 8 & 1 & 0 & 2 \end{bmatrix}$$

18) Solve the following system of homogenous equations.
$2x + 3y - z = 0$, $x - y - 2z = 0$, $3x + y + 3z = 0$

19) Find the rank of each of the following matrices:
$$\begin{bmatrix} 4 & 3 & 1 & -2 \\ -3 & -1 & -2 & 4 \\ 6 & 7 & -1 & 2 \end{bmatrix}$$

20) Find the rank of the following matrices which are in row-echelon form :
$$\begin{bmatrix} -2 & 2 & -1 \\ 0 & 5 & 1 \\ 0 & 0 & 0 \end{bmatrix}$$

21) Find the rank of the following matrices which are in row-echelon form :
$$\begin{bmatrix} 6 & 0 & -9 \\ 0 & 2 & 0 \\ 0 & 0 & 0 \\ 0 & 0 & 0 \end{bmatrix}$$

22) For any 2 x 2 matrix, if A (adj A) = $\begin{bmatrix} 10 & 0 \\ 0 & 10 \end{bmatrix}$ then find |A|.

23) For the matrix A, if $A^3 = I$, then find A^{-1}.

24) If A is a square matrix such that $A^3 = I$, then prove that A is non-singular.

25) Show that the system of equations is inconsistent. $2x + 5y = 7$, $6x + 15y = 13$.

26) Flod the rank of the matrix $\begin{bmatrix} 3 & -1 & 1 \\ -15 & 6 & -5 \\ 5 & -2 & 2 \end{bmatrix}$.

27) Show that the equations $3x + y + 9z = 0$, $3x + 2y + 12z = 0$ and $2x + y + 7z = 0$ have nontrivial solutions also.

28) Find k if the equations $x + 2y + 2z = 0$, $x - 3y - 3z = 0$, $2x + y + kz = 0$ have only the trivial solution.

29) Solve : 2x - y = 3, 5x + y = 4 using matrices.

30) Solve 6x - 7y = 16, 9x - 5y = 35 using (Cramer's rule).

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