Maths

Reg.No. :

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

Time : 01:15:00 Hrs

Total Marks : 71

Section-A

5 x 1 = 5

1) If A is a matrix of order 3, then $det(kA)$ is,

   (a) $k^3 det(A)$ (b) $k^2 det(A)$ (c) $k\, det(A)$ (d) $det\,(A)$

2) If l is the unit matrix of order n, where $k \neq 0$ is a constant, then $adj(kl)$ is

   (a) $k^n(adj\, I)$ (b) $k(adj\, I)$ (c) $k^2(adj(I))$ (d) $k^{n-1}(adj\, I)$

3) If A and B are any two matrices such that AB= 0 and A is non-singular, then

   (a) B=0   (b) B is singular   (c) B is non-singular   (d) B =A

4) If A = $\begin{pmatrix} 0 & 0 \\ 0 & 5 \end{pmatrix}$, then A^{12} is,

   (a) $\begin{pmatrix} 0 & 0 \\ 0 & 60 \end{pmatrix}$ (b) $\begin{pmatrix} 0 & 0 \\ 0 & 5^{12} \end{pmatrix}$ (c) $\begin{pmatrix} 0 & 0 \\ 0 & 0 \end{pmatrix}$ (d) $\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$

5) Inverse of $\begin{pmatrix} 3 & 1 \\ 5 & 2 \end{pmatrix}$ is,

   (a) $\begin{pmatrix} 2 & -1 \\ -5 & 3 \end{pmatrix}$ (b) $\begin{pmatrix} -2 & 5 \\ 1 & -3 \end{pmatrix}$ (c) $\begin{pmatrix} 3 & -1 \\ -5 & -3 \end{pmatrix}$ (d) $\begin{pmatrix} -3 & 5 \\ 1 & -2 \end{pmatrix}$

Section-B

4 x 3 = 12

6) Find the adjoint of the following matrices: $\begin{bmatrix} 2 & 5 & 3 \\ 3 & 1 & 2 \\ 1 & 2 & 1 \end{bmatrix}$

7) Solve the following non-homogeneous system of linear equations by determinant method: $2x + 3y = 5$; $4x + 6y = 12$

8) Find the inverse of the following matrices: $\begin{bmatrix} 2 & -1 \\ -4 & 2 \end{bmatrix}$

9) Find the inverse of the following matrices: $\begin{bmatrix} \cos\alpha & \sin\alpha \\ -\sin\alpha & \cos\alpha \end{bmatrix}$

Section-C

4 x 6 = 24

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

11) If $A = \begin{bmatrix} 1 & 2 \\ 1 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} 0 & -1 \\ 1 & 2 \end{bmatrix}$ verify that $(AB)^{-1} = B^{-1}A^{-1}$

12) Solve by matrix inversion method $x + y = 3, 2x + 3y = 8$

13) Find the rank of the matrix $\begin{bmatrix} 1 & 1 & 1 & 3 \\ 2 & -1 & 3 & 4 \\ 5 & -1 & 7 & 11 \end{bmatrix}$

Section-D

3x 10 = 30

14) Solve the following non-homogeneous system of linear equations determinant method: $3x + y - z = 2$; $2x - y + 2z = 6$; $2x + y - 2z = -2$

15) Solve the following non-homogeneous system of linear equations determinant method: $x + 2y + z = 6$; $3x + 3y - z = 3$; $2x + y - 2z = -3$

16) a)   Solve the following non-homogeneous system of linear equations determinant method: $\frac{1}{x} + \frac{2}{y} - \frac{1}{z} = 1$; $\frac{2}{x} + \frac{4}{y} + \frac{1}{z} = 5$; $\frac{3}{x} - \frac{2}{y} - \frac{2}{z} = 0$

(OR)

   b)   A small seminar hall can hold 100 chairs. Three different colours (red, blue and green) of chairs are available. The cost of a red chair is Rs. 240, cost of blue chair is Rs. 260 and the cost of a green chair is Rs. 300. The total cost of chair is Rs. 25,000. Find atleast 3 different solution of the number of chairs in each colour to be purchased.

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