Maths

Reg.No. : ☐☐☐☐☐☐

I.Answer all the Questions

II.use blue pen only.

Time : 01:00:00 Hrs

Total Marks : 78

Section-A

5 x 1 = 5

1) If A is a scalar matrix with scalar $k \neq 0$, of order 3, then A^{-1} is

(a) $\frac{1}{k^2}I$ (b) $\frac{1}{k^3}I$ (c) $\frac{1}{k}I$ (d) $K\, I$

2) If the matrix $\begin{pmatrix} -1 & 3 & 2 \\ 1 & k & -3 \\ 1 & 4 & 5 \end{pmatrix}$ has an inverse then the values of k

(a) k is any real number   (b) k = -4   (c) $k \neq -4$ (d) $k \neq 4$

3) If A = $\begin{pmatrix} 2 & 1 \\ 3 & 4 \end{pmatrix}$, then (adjA) A =

(a) $\begin{pmatrix} \frac{1}{5} & 0 \\ 0 & \frac{1}{5} \end{pmatrix}$ (b) $\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$ (c) $\begin{pmatrix} 5 & 0 \\ 0 & -5 \end{pmatrix}$ (d) $\begin{pmatrix} 5 & 0 \\ 0 & 5 \end{pmatrix}$

4) If A is a square matrix of order n then $|adjA|$ is

(a) $|A|^2$ (b) $|A|^n$ (c) $|A|^{n-1}$ (d) $|A|$

5) The inverse of the matrix $\begin{pmatrix} 0 & 0 & 1 \\ 0 & 1 & 0 \\ 1 & 0 & 0 \end{pmatrix}$ is

(a) $\begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$ (b) $\begin{pmatrix} 0 & 0 & 1 \\ 0 & 1 & 0 \\ -1 & 0 & 0 \end{pmatrix}$ (c) $\begin{pmatrix} 0 & 0 & 1 \\ 0 & 1 & 0 \\ 1 & 0 & 0 \end{pmatrix}$ (d) $\begin{pmatrix} -1 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$

Section-B

3 x 3 = 9

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

7) Find the rank of the matrix $\begin{bmatrix} 1 & -2 & 3 \\ -2 & 4 & -6 \\ 5 & 1 & -1 \end{bmatrix}$

8) Solve: $x + y + 2z = 0$; $2x + y - z = 0$; $2x + 2y + z = 0$

Section-C

4 x 6 = 24

9) Solve the following non-homogeneous system of linear equations by determinant method: $4x + 5y = 9; 8x + 10y = 18$

10) Examine the consistency of the following system of equations. If it is consistent then solve the same. $x + y + z = 7; x + 2y + 3z = 18; y + 2z = 6$

11) Find the adjoint of the matrix $A = \begin{bmatrix} 1 & 1 & 1 \\ 1 & 2 & -3 \\ 2 & -1 & 3 \end{bmatrix}$

12) If $A = \begin{bmatrix} -1 & 2 \\ 1 & -4 \end{bmatrix}$, verify the result $A(adjA) = (adjA)A = |A|I_2$

Section-D

3 x 10 = 30

13) Solve by matrix inversion method each of the following system of linear equations: $2x - y + z = 7$, $3x + y - 5z = 13$, $x + y + z = 5$

14) Solve the following non-homogeneous system of linear equations determinant method: $x + y + z = 4$; $x - y + z = 2$; $2x + y - z = 1$

15) a)   Solve the following non-homogeneous system of linear equations determinant method: $2x + y - z = 4$; $x + y - 2z = 0$; $3x + 2y - 3z = 4$

(OR)

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

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