Model Question Paper

Matrices and Determinants- Part VI

12th Standard

Maths

Reg.No. : | | | | | | |

I.Answer all the Questions.

II.Use blue pen only.

Time : 01:30:00 Hrs

Total Marks : 95

Section-A

5 x 1 = 5

1) The rank of the matrix $\begin{pmatrix} 2 & -4 \\ -1 & 2 \end{pmatrix}$ is

(a) 1 (b) 2 (c) 0 (d) 8

2) The rank of the matrix $\begin{pmatrix} 7 & -1 \\ 2 & 1 \end{pmatrix}$ is

(a) 9 (b) 2 (c) 1 (d) 5

3) If A and B are matrices conformable to multiplication then $(AB)^T$ is

(a) $A^T B^T$ (b) $B^T A^T$ (c) AB (d) BA

4) $(A^T)^{-1}$ is equal to

(a) A^{-1} (b) A^T (c) A (d) $(A^{-1})^T$

5) if $\rho(A) = r$ then which of the following is correct ?

(a) all the minors of order r which does not vanish (b) A has atleast one minor of order r which does not vanish and all higher order minor vanish

(c) A has atleast one $(r+1)$ order minor which vanishes (d) all $(r+1)$ and higher order minors should not vanish

Section-B

5 x 6 = 30

6) Find the rank of the matrix $\begin{bmatrix} 4 & 2 & 1 & 3 \\ 6 & 3 & 4 & 7 \\ 2 & 1 & 0 & 1 \end{bmatrix}$

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

8) Solve the following non-homogeneous equations of three unknowns $2x + 2y + z = 5$; $x - y + z = 1$; $3x + y + 2z = 4$

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

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

Section-C

6 x 10 = 60

11) If $A = \begin{bmatrix} 1 & 1 & 1 \\ 1 & 2 & -3 \\ 2 & -1 & 3 \end{bmatrix}$, verify $A\,(adjA) = (adjA)\,A = |A|\,I_3$

12) Solve by matrix inversion method $2x - y + 3z = 9$, $x + y + z = 6$, $x - y + z = 2$

13) Solve the following non-homogeneous equations of three unknowns.$x + 2y + z = 7$; $2x - y + 2z = 4$; $x + y - 2z = -1$

14) A bag contains 3 types of coins namely Re.1 , Rs. 2 and Rs. 5. There are 30 coins amounting to Rs. 100 in total. Find the number of coins in each category.

15) Solve: $x + y + 2z = 0$; $3x + 2y + z = 0$; $2x + y - z = 0$

16) a) Find the inverse of the following matrices : $\begin{bmatrix} 8 & -1 & -3 \\ -5 & 1 & 2 \\ 10 & -1 & -4 \end{bmatrix}$

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

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