

Model Question Paper

Matrices - Part III

10th Standard

Maths

Reg.No. :

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I. Answer all the questions.

II. Use Blue pen only.

Time : 01:00:00 Hrs

Total Marks : 70

5 x 1 = 5

Section-A

- 1) If $\begin{pmatrix} 1 & 2 \\ 2 & 1 \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} \begin{pmatrix} 2 \\ 4 \end{pmatrix}$, then the values of x and y respectively, are
(a) 2, 0 (b) 0, 2 (c) 0, -2 (d) 1, 1
- 2) If $A = \begin{pmatrix} 1 & -2 \\ -3 & 4 \end{pmatrix}$ and $A + B = 0$, then B is
(a) $A \begin{pmatrix} 1 & -2 \\ -3 & 4 \end{pmatrix}$ (b) $\begin{pmatrix} 1 & 2 \\ 3 & -4 \end{pmatrix}$ (c) $\begin{pmatrix} -1 & -2 \\ -3 & -4 \end{pmatrix}$ (d) $\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$
- 3) If $A = \begin{pmatrix} 4 & -2 \\ 6 & -3 \end{pmatrix}$, then A^2 is
(a) $\begin{pmatrix} 16 & 4 \\ 36 & 9 \end{pmatrix}$ (b) $\begin{pmatrix} 8 & -4 \\ 12 & -6 \end{pmatrix}$ (c) $\begin{pmatrix} -4 & 2 \\ -6 & 3 \end{pmatrix}$ (d) $\begin{pmatrix} 4 & -2 \\ 6 & -3 \end{pmatrix}$
- 4) A is order m x n and B is order p x q, addition of A and B is possible only if
(a) m = p (b) n = q (c) n = p (d) m = p, n = q
- 5) If $A = (1 -2 3)$ and $B = \begin{pmatrix} -1 \\ 2 \\ -3 \end{pmatrix}$ then $A+B$
(a) (0 0 0) (b) $\begin{pmatrix} 0 \\ 0 \\ 0 \end{pmatrix}$ (c) (-14) (d) not defined

Section-B

- 6) Construct a 2x2 matrix $A = [a_{ij}]$ whose elements are given by $a_{ij} = 2i - j$
- 7) Construct a 2x2 matrix $A = [a_{ij}]$ whose elements are given by $a_{ij} = \frac{i-j}{i+j}$
- 8) Find the product of the matrices, if exists $\begin{pmatrix} 3 & -2 \\ 5 & 1 \end{pmatrix} \begin{pmatrix} 4 & 1 \\ 2 & 7 \end{pmatrix}$
- 9) Find the product of the matrices, if exists $\begin{pmatrix} 2 & 9 & -3 \\ 4 & -1 & 0 \end{pmatrix} \begin{pmatrix} 4 & 2 \\ -6 & 7 \\ -2 & 1 \end{pmatrix}$
- 10) Find the product of the matrices, if exists $\begin{pmatrix} 6 \\ -3 \end{pmatrix} (2 \ -7)$
- 11) If $A = \begin{pmatrix} 3 & 2 \\ 5 & 1 \end{pmatrix}$, $B = \begin{pmatrix} 1 & -2 \\ 2 & 3 \end{pmatrix}$ and $O = \begin{pmatrix} 0 & 0 \\ 0 & 0 \end{pmatrix}$ then verify: $A + (-A) = O = (-A) + A$.

Section-C

- 12) If $A = \begin{pmatrix} 5 & 2 \\ 7 & 3 \end{pmatrix}$ and $B = \begin{pmatrix} 2 & -1 \\ -1 & 1 \end{pmatrix}$ verify that $(AB)^T = B^T A^T$
- 13) Prove that $A = \begin{pmatrix} 5 & 2 \\ 7 & 3 \end{pmatrix}$ and $B = \begin{pmatrix} 3 & -2 \\ -7 & 5 \end{pmatrix}$ are inverses to each other under matrix multiplication
- 14) $A = \begin{pmatrix} 1 & -4 \\ -2 & 3 \end{pmatrix}$ and $B = \begin{pmatrix} -1 & 6 \\ 3 & -2 \end{pmatrix}$ then prove that $(A + B)^2 \neq A^2 + 2AB + B^2$
- 15) If $A = \begin{pmatrix} 3 & 3 \\ 7 & 6 \end{pmatrix}$, $B = \begin{pmatrix} 8 & 7 \\ 0 & 9 \end{pmatrix}$ and $C = \begin{pmatrix} 2 & -3 \\ 4 & 6 \end{pmatrix}$ find $(A+B)C$ and $AC+BC$. Is $(A+B)C = AC+BC$?
- 16) Solve: $(x \ 1) \begin{pmatrix} 1 & 0 \\ -2 & -3 \end{pmatrix} \begin{pmatrix} x \\ 5 \end{pmatrix} = (0)$.

6 x 2 = 12

5 x 5 = 25