

Model Question Paper

Matrices - Part II

10th Standard

Maths

Reg.No. : 

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I. Answer all the questions.

II. Use Blue pen only.

Time : 01:15:00 Hrs

Total Marks : 60

6 x 1 = 6

Section-A

- 1) Which one of the following is true for any two square matrices A and B of same order?  
(a)  $(A^T B)^T = A^T B^T$  (b)  $(AB)^T = A^T B^T$  (c)  $(AB)^T = BA$  (d)  $(AB)^T = B^T A^T$
- 2) Which one of the following statements is not true?  
(a) A scalar matrix is a square matrix (b) A diagonal matrix is a square matrix (c) A scalar matrix is a diagonal matrix (d) A diagonal matrix is a scalar matrix
- 3) Matrix  $A = [a_{ij}]_{m \times n}$  is a matrix if  
(a)  $m < n$  (b)  $m > n$  (c)  $m = 1$  (d)  $m = n$
- 4) If  $\begin{pmatrix} 3x+7 & 5 \\ y+1 & 2-3x \end{pmatrix} = \begin{pmatrix} 1 & y-2 \\ 8 & 8 \end{pmatrix}$  then the values of x and y respectively are  
(a) -2, 7 (b)  $-\frac{1}{3}, 7$  (c)  $-\frac{1}{3}, \frac{2}{3}$  (d) 2, -7
- 5) If a matrix is of order 2 x 3, then the number in the matrix is  
(a) 5 (b) 6 (c) 2 (d) 3
- 6) If  $\begin{pmatrix} 8 & 4 \\ x & 8 \end{pmatrix} = 4 \begin{pmatrix} 2 & 1 \\ 1 & 2 \end{pmatrix}$  then the value of x is  
(a) 1 (b) 2 (c)  $\frac{1}{4}$  (d) 4

Section-B

7 x 2 = 14

- 7) Construct a 2x2 matrix  $A = [a_{ij}]$  whose elements are given by  $a_{ij} = ij$
- 8) Construct a 3x2 matrix  $A = [a_{ij}]$  whose elements are given by  $a_{ij} = i/j$
- 9) Find the order of the following matrices. (i)  $\begin{pmatrix} 1 & -1 & 5 \\ -2 & 3 & 4 \end{pmatrix}$  (ii)  $\begin{pmatrix} 7 \\ 8 \\ 9 \end{pmatrix}$  (iii)  $\begin{pmatrix} 3 & -2 & 6 \\ 6 & -1 & 1 \\ 2 & 4 & 5 \end{pmatrix}$  (iv) (3 4 5) (v)  $\begin{pmatrix} 1 & 2 \\ -2 & 3 \\ 9 & 7 \\ 6 & 4 \end{pmatrix}$
- 10) If  $A = \begin{pmatrix} 1 & -1 & 3 & 2 \\ 5 & -4 & 7 & 4 \\ 6 & 0 & 9 & 8 \end{pmatrix}$  (i) find the order of the matrix (ii) write down the elements  $a_{24}$  and  $a_{32}$  (iii) in which row and column does the element 7 occur?
- 11) If  $A = \begin{pmatrix} 2 & 3 \\ 4 & 1 \\ 5 & 0 \end{pmatrix}$  then find the transpose of A.
- 12) If  $A = \begin{pmatrix} 1 & 2 & 3 \\ 2 & 4 & -5 \\ 3 & -5 & 6 \end{pmatrix}$  then verify that  $(A^T)^T = A$ .
- 13) Find the values of x, y and z if  $\begin{pmatrix} x & 5 & 4 \\ 5 & 9 & 1 \end{pmatrix} = \begin{pmatrix} 3 & 5 & z \\ 5 & y & 1 \end{pmatrix}$

Section-C

6 x 5 = 30

- 14) If  $A = \begin{pmatrix} 8 & -7 \\ -2 & 4 \\ 0 & 3 \end{pmatrix}$  and  $B = \begin{pmatrix} 9 & -3 & 2 \\ 6 & -1 & -5 \end{pmatrix}$ , then find AB and BA if they exist.
- 15) If  $A = \begin{pmatrix} 3 & 2 \\ -1 & 4 \end{pmatrix}$ ,  $B = \begin{pmatrix} -2 & 5 \\ 6 & 7 \end{pmatrix}$  and  $C = \begin{pmatrix} 1 & 1 \\ -5 & 3 \end{pmatrix}$  verify that  $A(B+C) = AB+AC$
- 16) If  $A = \begin{pmatrix} -2 \\ 4 \\ 5 \end{pmatrix}$  and  $B = (1 \ 3 \ -6)$ , then verify that  $(AB^T) = B^T A^T$
- 17) If  $A = \begin{pmatrix} 1 & -1 \\ 2 & 3 \end{pmatrix}$  then show that  $A^2 - 4A + 5I_2 = 0$
- 18) If  $A = \begin{pmatrix} 3 & 2 \\ 4 & 0 \end{pmatrix}$  and  $B = \begin{pmatrix} 3 & 0 \\ 3 & 2 \end{pmatrix}$  then find AB and BA. Are they equal?
- 19) a) Solve:  $\begin{pmatrix} y \\ 3x \end{pmatrix} = \begin{pmatrix} 6 & -2x \\ 31 & 4y \end{pmatrix}$   
b) If  $A = \begin{pmatrix} -1 & 2 & 4 \\ 3 & 6 & -5 \end{pmatrix}$  then find 3A

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