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Exam Time : 02:00:00 Hrs

Total Marks : 80

16 x 5 = 80

**I. ANSWER ALL QUESTION**

- 1) If  $A = \begin{bmatrix} 1 & 8 & 3 \\ 3 & 5 & 0 \\ 8 & 7 & 6 \end{bmatrix}$ ,  $B = \begin{bmatrix} 8 & -6 & -4 \\ 2 & 11 & -3 \\ 0 & 1 & 5 \end{bmatrix}$ ,  $C = \begin{bmatrix} 5 & 3 & 0 \\ -1 & -7 & 2 \\ 1 & 4 & 3 \end{bmatrix}$  compute the following  
 $3A + 2B - C$
- 2) If  $A = \begin{bmatrix} 4 & 3 & 1 \\ 2 & 3 & -8 \\ 1 & 0 & -4 \end{bmatrix}$ ,  $B = \begin{bmatrix} 2 & 3 & 4 \\ 1 & 9 & 2 \\ -7 & 1 & -1 \end{bmatrix}$  and  $C = \begin{bmatrix} 8 & 3 & 4 \\ 1 & -2 & 3 \\ 2 & 4 & -1 \end{bmatrix}$  then verify that  $A + (B + C) = (A + B) + C$ .
- 3) Find X and Y if  $X + Y = \begin{bmatrix} 7 & 0 \\ 3 & 5 \end{bmatrix}$  and  $X - Y = \begin{bmatrix} 3 & 0 \\ 0 & 4 \end{bmatrix}$
- 4) Find x and y if  $x \begin{bmatrix} 4 \\ -3 \end{bmatrix} + y \begin{bmatrix} -2 \\ 3 \end{bmatrix} = \begin{bmatrix} 4 \\ 6 \end{bmatrix}$
- 5) Solve for x, y :  $\begin{bmatrix} x^2 \\ y^2 \end{bmatrix} + 2 \begin{bmatrix} -2x \\ -y \end{bmatrix} = \begin{bmatrix} -5 \\ 8 \end{bmatrix}$
- 6) If  $A = \begin{bmatrix} 1 & -1 & 2 \\ 1 & -1 & 2 \end{bmatrix}$ ,  $B = \begin{bmatrix} 1 & -1 \\ 2 & 1 \\ 1 & 3 \end{bmatrix}$  and  $C = \begin{bmatrix} 1 & 2 \\ 2 & -1 \end{bmatrix}$  show that  $(AB)C = A(BC)$
- 7) If  $A = \begin{bmatrix} 1 & 1 \\ -1 & 3 \end{bmatrix}$ ,  $B = \begin{bmatrix} 1 & 2 \\ -4 & 2 \end{bmatrix}$ ,  $C = \begin{bmatrix} -7 & 6 \\ 3 & 2 \end{bmatrix}$  verify that  $A(B + C) = AB + AC$
- 8) If  $A = \begin{bmatrix} 1 & 2 & 1 \\ 2 & -1 & 1 \end{bmatrix}$  and  $B = \begin{bmatrix} 2 & -1 \\ -1 & 4 \\ 0 & 2 \end{bmatrix}$  show that  $(AB)^T = B^T A^T$
- 9) Given that  $A = \begin{bmatrix} 1 & 3 \\ 5 & -1 \end{bmatrix}$ ,  $B = \begin{bmatrix} 1 & -1 & 2 \\ 3 & 5 & 2 \end{bmatrix}$ ,  $C = \begin{bmatrix} 1 & 3 & 2 \\ -4 & 1 & 3 \end{bmatrix}$  verify that  $A(B + C) = AB + AC$ .
- 10) Let  $A = \begin{bmatrix} 1 & 2 \\ 1 & 3 \end{bmatrix}$ ,  $B = \begin{bmatrix} 4 & 0 \\ 1 & 5 \end{bmatrix}$ ,  $C = \begin{bmatrix} 2 & 0 \\ 1 & 2 \end{bmatrix}$  Show that  
 $A(BC) = (AB)C$
- 11) If  $A = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$  and  $I = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$  show that  $A^2 - (a + d)A = (bc - ad)I_2$
- 12) If  $A = \begin{bmatrix} 5 & 2 & 9 \\ 1 & 2 & 8 \end{bmatrix}$ ,  $B = \begin{bmatrix} 1 & 7 \\ 1 & 2 \\ 5 & -1 \end{bmatrix}$  verify that  $(AB)^T = B^T A^T$
- 13) If  $A = \begin{bmatrix} 3 & 1 \\ -1 & 2 \end{bmatrix}$  show that  $A^2 - 5A + 7I_2 = 0$
- 14) If  $A = \begin{bmatrix} 0 & 4 & 9 \\ 8 & 3 & 7 \end{bmatrix}$ ,  $B = \begin{bmatrix} 7 & 3 & 8 \\ 1 & 4 & 9 \end{bmatrix}$  find the value of  $3A - 9B$
- 15) Let  $A = \begin{bmatrix} 1 & 2 \\ 1 & 3 \end{bmatrix}$ ,  $B = \begin{bmatrix} 4 & 0 \\ 1 & 5 \end{bmatrix}$ ,  $C = \begin{bmatrix} 2 & 0 \\ 1 & 2 \end{bmatrix}$  Show that  $(A - B)C = AC - BC$
- 16) Let  $A = \begin{bmatrix} 1 & 2 \\ 1 & 3 \end{bmatrix}$ ,  $B = \begin{bmatrix} 4 & 0 \\ 1 & 5 \end{bmatrix}$ ,  $C = \begin{bmatrix} 2 & 0 \\ 1 & 2 \end{bmatrix}$  Show that  $(A - B)^T = A^T - B^T$

**ALL THE BEST**

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