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UNIT TEST

CLASS: 10 **MARKS: 50**
SUBJECT: MATHS **TIME: 1.30 hrs.**
I. Choose the correct answer: **7 x 1 = 7**

1. For the given matrix A = $\begin{pmatrix}1 & 3 & 5 & 7\\2 & 4 & 6 & 8\\9 & 11 & 13 & 15\end{pmatrix}$ the order of the matrix A^T is
   (A) 2 x 3 (B) 3 x 2 (C) 3 x 4 (D) 4 x 3
2. If A is a 2 x 3 matrix and B is a 3 x 4 matrix, how many columns does AB have
   (A) 3 (B) 4 (C) 2 (D) 5
3. If number of columns and rows are not equal in a matrix then it is said to be a
   (A) Diagonal matrix (B) rectangular matrix (C) square matrix (D) identity matrix
4. Transpose of a column matrix is
   (A) Unit matrix (B) diagonal matrix (C) column matrix (D) row matrix
5. Find the matrix X if $2X + \begin{pmatrix}1 & 3\\5 & 7\end{pmatrix} = \begin{pmatrix}5 & 7\\9 & 5\end{pmatrix}$.
   (A) $\begin{pmatrix}-2 & -2\\2 & -1\end{pmatrix}$ (B) $\begin{pmatrix}2 & 2\\2 & -1\end{pmatrix}$ (C) $\begin{pmatrix}1 & 2\\2 & 2\end{pmatrix}$ (D) $\begin{pmatrix}2 & 1\\2 & 2\end{pmatrix}$.
6. Which of the following can be calculated from A=$\begin{pmatrix}1 & 2\\3 & 4\\5 & 6\end{pmatrix}$,B=$\begin{pmatrix}1 & 2 & 3\\4 & 5 & 6\\7 & 8 & 9\end{pmatrix}$,
   (i) A^2 (ii) B^2 (iii) AB (iv)BA .
   (A) (i) and (ii) only (B) (ii) and (iii) only (C) (ii) and (iv) only (D) all of these
7. If A = $\begin{pmatrix}1 & 2 & 3\\3 & 2 & 1\end{pmatrix}$, B = $\begin{pmatrix}1 & 0\\2 & -1\\0 & 2\end{pmatrix}$ and C = $\begin{pmatrix}0 & 1\\-2 & 5\end{pmatrix}$, which of the following statements are correct? (i) AB+C=$\begin{pmatrix}5 & 5\\5 & 5\end{pmatrix}$ (ii) BC=$\begin{pmatrix}0 & 1\\2 & -3\\-4 & 10\end{pmatrix}$ (iii) BA+C=$\begin{pmatrix}2 & 5\\3 & 0\end{pmatrix}$ (iv)(AB)C=$\begin{pmatrix}-8 & 20\\-8 & 13\end{pmatrix}$.
   (A) (i) and (ii) only (B)(ii) and (iii) only (C) (iii) and (iv) only (D) all of these.

II. Answer any FIVE questions: (Q.No.14 is compulsory) **7 x 2 = 14**

8. If a matrix has 16 elements, what are the possible orders if can have?
9. Construct a 3 x 3 matrix whose elements are $a_{ij} = i^2j^2$.
10. If A = $\begin{pmatrix}5 & 4 & 3\\1 & -7 & 9\\3 & 8 & 2\end{pmatrix}$ then find the transpose of A.
11. If A = $\begin{pmatrix}1 & 3 & -2\\5 & -4 & 6\\-3 & 2 & 9\end{pmatrix}$, B = $\begin{pmatrix}1 & 8\\3 & 4\\9 & 6\end{pmatrix}$ find A+B.
12. If A = $\begin{pmatrix}1 & 9\\3 & 4\\8 & -3\end{pmatrix}$, B = $\begin{pmatrix}5 & 7\\3 & 3\\1 & 0\end{pmatrix}$ then verify that (i) A+B=B+A
13. Find the value of x,y,z if (i) $\begin{pmatrix}x-3 & 3x-z\\x+y+7 & x+y+z\end{pmatrix} = \begin{pmatrix}1 & 0\\1 & 6\end{pmatrix}$
14. If A is of order p x q and B is of order q x r what is the order of AB and BA?

III. Answer any FIVE questions. (Q.No.21 is compulsory) **7 x 5 = 35**

15. If A=$\begin{pmatrix}1 & 8 & 3\\3 & 5 & 0\\8 & 7 & 6\end{pmatrix}$,B=$\begin{pmatrix}8 & -6 & -4\\2 & 11 & -3\\0 & 1 & 5\end{pmatrix}$,C=$\begin{pmatrix}5 & 3 & 0\\-1 & -7 & 2\\1 & 4 & 3\end{pmatrix}$.
    Compute the following: (i) 3A+2B-C (ii) $\frac{1}{2}A - \frac{3}{2}B$.
16. If A=$\begin{pmatrix}4 & 3 & 1\\2 & 3 & -8\\1 & 0 & -4\end{pmatrix}$, B=$\begin{pmatrix}2 & 3 & 4\\1 & 9 & 2\\-7 & 1 & -1\end{pmatrix}$ and C=$\begin{pmatrix}8 & 3 & 4\\1 & -2 & 3\\2 & 4 & -1\end{pmatrix}$then verify A+(B+C) = (A+B)+C.
17. Find X and Y if X+Y = $\begin{pmatrix}7 & 0\\3 & 5\end{pmatrix}$ and X - Y = $\begin{pmatrix}3 & 0\\0 & 4\end{pmatrix}$.
18. If A =(1 −1 2), B = $\begin{pmatrix}1 & -1\\2 & 1\\1 & 3\end{pmatrix}$ and C = $\begin{pmatrix}1 & 2\\2 & -1\end{pmatrix}$, show that (AB)C = A(BC).

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19. If $A = \begin{pmatrix} 1 & 2 & 1 \\ 2 & -1 & 1 \end{pmatrix}$ and $B = \begin{pmatrix} 2 & -1 \\ -1 & 4 \\ 0 & 2 \end{pmatrix}$ show that $(AB)^T = B^T A^T$.

20. Given that $A = \begin{pmatrix} 1 & 3 \\ 5 & -1 \end{pmatrix}$, $B = \begin{pmatrix} 1 & -1 & 2 \\ 3 & 5 & 2 \end{pmatrix}$, $C = \begin{pmatrix} 1 & 3 & 2 \\ -4 & 1 & 3 \end{pmatrix}$ verify that A(B+C)=AB+AC.

21. If $A = \begin{pmatrix} 3 & 1 \\ -1 & 2 \end{pmatrix}$ show that $A^2-5A+7I_2 = O$.

IV. Answer all the question: **1 x 8 = 8**

22. Construct a triangle PQR in which QR=5 cm, ∠P=40° and the median PG from P to QR is 4.4cm. Find the length of the altitude from P to QR. **(OR)**

A two wheeler parking zone near bus stand charges as below.

Time (in hours) (x)	4	8	12	24
Amount (in Rs.) (y)	60	120	180	360

Check if the amount charged are in direct variation or in inverse variation to the parking time. Graph the data. Also (i) find the amount to be paid when parking time in 6 hr; (ii) find the parking duration when the paid is Rs.150.