



Class:10

UNIT TEST-3, NOVEMBER - 2024

Time Allowed : 1.30 Hours]

MATHEMATICS

[Max. Marks.: 50

PART - I

I. Choose the correct Answer.

7x1=7

1. If A is a 2×3 matrix and B is a 3×4 matrix, how many columns does AB have -----
(a) 3 (b) 4 (c) 2 (d) 5
2. The 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) Column matrix (d) Row matrix
3. Find the matrix x if $2x + \begin{bmatrix} 1 & 3 \\ 5 & 7 \end{bmatrix} = \begin{bmatrix} 5 & 7 \\ 9 & 5 \end{bmatrix}$
(a) $\begin{bmatrix} -2 & -2 \\ 2 & -1 \end{bmatrix}$ (b) $\begin{bmatrix} 2 & 2 \\ 2 & -1 \end{bmatrix}$ (c) $\begin{bmatrix} 1 & 2 \\ 2 & 2 \end{bmatrix}$ (d) $\begin{bmatrix} 2 & 1 \\ 2 & 2 \end{bmatrix}$
4. A tangent is perpendicular to the radius at the -----
(a) Centre (b) point of contact (c) infinity (d) chord
5. Two tangents from an external points P to a circle with centre O are PA and PB. If $\angle APB = 70^\circ$ then the value of $\angle AOB$ is ---
(a) 100° (b) 110° (c) 120° (d) 130°
6. Transpose of Column matrix is
(a) Unit matrix (b) Diagonal matrix (c) Column matrix (d) Row matrix
7. How many tangents can be drawn to the circle from an exterior point is
(a) 1 (b) 2 (c) infinite (d) zero

PART - II

II. Answer any five questions only. [Q.No. 14 is compulsory].

5x2=10

8. If $A = \begin{bmatrix} 5 & 2 & 2 \\ -\sqrt{17} & 0.7 & 5/2 \\ 8 & 3 & 1 \end{bmatrix}$ then verify $(A^T)^T = A$.

9. If $A = \begin{bmatrix} 7 & 8 & 6 \\ 1 & 3 & 9 \\ -4 & 3 & -1 \end{bmatrix}$, $B = \begin{bmatrix} 4 & 11 & -3 \\ -1 & 2 & 4 \\ 7 & 5 & 0 \end{bmatrix}$ then find $2A + B$

SATGURU STUDY CENTRE

10. A man goes 18 m due to east and then 24 m due north. Find the distance of his current position from the starting point?
11. The length of the tangent to a circle from a point P, which is 25 cm away from the centre is 24 cm. What is the radius of the circle?
12. If A is of order $p \times q$ and B is of order $q \times r$ What is the order of $A \times B$ and $B \times A$.
13. State Ceva's Theorem.
14. If $A = \begin{pmatrix} \cos\theta & \sin\theta \\ -\sin\theta & \cos\theta \end{pmatrix}$ Prove that $AA^T = I$

PART - III

III. Answer any Five questions. Q.No. 21 is compulsory.

5x5=25

15. Find X and Y if $X + Y = \begin{bmatrix} 7 & 0 \\ 3 & 5 \end{bmatrix}$ and $X - Y = \begin{bmatrix} 3 & 0 \\ 0 & 4 \end{bmatrix}$
16. If $A = \begin{bmatrix} 1 & 2 & 1 \\ 2 & -1 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} 2 & -1 \\ -1 & 4 \\ 0 & 2 \end{bmatrix}$ Then show that $(AB)^T = B^T A^T$
17. If $A = \begin{bmatrix} 3 & 1 \\ -1 & 2 \end{bmatrix}$ the show that $A^2 - 5A + 7I_2 = 0$.
18. Show that the angle bisectors of a triangle are concurrent.
19. If $A = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$ and $I = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ Show that $A^2 - (a+d)A = (b^2 - ad)I_2$.
20. P and Q are the mid points of the sides CA and CB respectively of a $\triangle ABC$, right angled at C. Prove that $4(AQ^2 + BP^2) = 5AB^2$
21. State and Prove Pythagoras theorem.

PART - IV

IV. Answer Any One of the following.

1x8=8

22. Draw two tangents from the point which is 10cm away from the centre of the circle of radius 5cm. Also measure the lengths of the tangents.
23. Discuss the nature of the solutions of the quadratic equation : $x^2 + x - 12 = 0$