



Standard 10

Time: 1.30 Hours

MATHS

Marks: 50

PART - A

I. Choose the best answer :

7×1=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) Transpose of a column matrix is
a) Unit matrix b) diagonal matrix
c) column matrix d) row matrix
- 3) How many tangents can be drawn to the circle from an exterior point?
a) one b) two c) ∞ d) 0
- 4) The two tangents from an external point P to a circle with the centre at 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°
- 5) The tower is 60 m high. Its shadow reduces by x metres when the angle of elevation of sun increases from 30° to 45° then x is equal to
a) 41.92m b) 43.92m c) 43m d) 45.6m
- 6) The height of a right circular cone whose radius is 5cm and slant height is 13 cm will be
a) 12 cm b) 10 cm c) 13 cm d) 5 cm
- 7) The total surface area of a hemi-sphere is how much times the square of its radius
a) π b) 4π c) 3π d) 2π

PART - B

Answer the following questions. (Any 5): Q.No. 14 is compulsory. 5×2=10

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

- 9) Find the length of the tangent drawn from a point whose distance from the centre of a circle is 5cm and radius of the circle is 3 cm.
- 10) Find the angle of elevation of the top of a tower from a point on the ground, which is 30 m away from the foot of a tower of height $10\sqrt{3}$ m.
- 11) A tower stands vertically on the ground. From a point on the ground which is 48m away from the foot of the tower, the angle of elevation of the top of the tower is 30° . Find the height of the tower.
- 12) The curved surface area of a right circular cylinder of height 14 cm is 88cm^2 . Find the diameter of the cylinder.
- 13) The volumes of two cones of same base radius are 3600cm^3 and 5040cm^3 . Find the ratio of heights.
- 14) Find the value of x, y, z if $(x \ y - z \ z + 3) + (y \ 4 \ 3) = (4 \ 8 \ 16)$

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PART - C

Answer the following questions: Q.No.21 is compulsory.

5×5=25

15) If $A = \begin{pmatrix} 1 & -1 & 2 \end{pmatrix}$, $B = \begin{pmatrix} 1 & -1 \\ 2 & 1 \\ 1 & 3 \end{pmatrix}$ and $C = \begin{pmatrix} 1 & 2 \\ 2 & -1 \end{pmatrix}$ show that $(AB)C=A(BC)$

16) If $A = \begin{pmatrix} 3 & 1 \\ -1 & 2 \end{pmatrix}$ show that $A^2 - 5A + 7I_2 = 0$

17) State and prove Pythagores Theorem.

18) To a man standing outside his house, the angle of elevation of the top and bottom of a window are 60° and 45° respectively. If the height of the man is 180 cm and if he is 5m away from the wall, what is the height of the window? ($\sqrt{3} = 1.732$)

19) The Pole 5m high is fixed on the top of a tower. The angle of elevation of the top of the pole observed from a point "A" on a ground is 60° and the angle of depression to the point "A" from the top of the tower 45° . Find the height of the tower. ($\sqrt{3} = 1.732$)

20) A solid iron cylinder has total surface area of 1848 sq.cm. It curved surface area is five-sixth of its total surface area. Find the radius and height of the iron cylinder.

21) If the radii of the circular ends of a frustum which is 45cm high are 28cm and 7cm find the volume of the frustum.

PART - D

Answer the following questions:

1×8=8

22) a) Draw a circle of diameter 6 cm from a point P. Which is 8cm away from its centre. Draw the two tangents PA and PB to the circle and measure their lengths.

(OR)

b) Draw the graph of $y = x^2 + x - 2$ and hence solve $x^2 + x - 2 = 0$.
