

**Standard - 10****MATHMATICS**

Time:

**Part - A**

Marks: 50

**I. Choose the best option.****7x1=7**

1. For the given matrix  $A = \begin{bmatrix} 1 & 3 & 5 & 7 \\ 2 & 4 & 6 & 8 \\ 9 & 11 & 13 & 15 \end{bmatrix}$  the order of the matrix  $A^T$  is
- a)  $2 \times 3$                       b)  $3 \times 2$                       c)  $3 \times 4$                       d)  $4 \times 3$
2. A tangent is perpendicular to the radius at the
- a) centre                      b) point of contact  
c) infinity                      d) chord
3. How many tangents can be drawn to the circle from an exterior point?
- a) one                      b) two                      c) Infinite                      d) zero.
4. The electric pole Substends an angle of  $30^\circ$  at a point on the same level as its foot. At a second point b metres above the first, the depression of the foot of the pole is  $60^\circ$ . The height of the pole (in metres) is equal to
- a)  $\sqrt{3b}$                       b)  $\frac{b}{3}$                       c)  $\frac{b}{2}$                       d)  $\frac{b}{\sqrt{3}}$
5. The angle of Elevation of cloud from a point h metres above a lake is  $\beta$ . The angle of depression of its reflection in the lake is  $45^\circ$  The height of location of the cloud from the lake is
- a)  $\frac{h(1+\tan\beta)}{1-\tan\beta}$                       b)  $\frac{h(1-\tan\beta)}{1+\tan\beta}$   
c)  $h \tan(45^\circ - \beta)$                       d) None of these
6. The curved surface area of a right circular cone of height 15 cm and base diameter 16 cm is
- a)  $60\pi \text{ cm}^2$                       b)  $68\pi \text{ cm}^2$   
c)  $120\pi \text{ cm}^2$                       d)  $136\pi \text{ cm}^2$
7. The total surface area of cylinder whose radius is  $\frac{1}{3}$  of its height is
- a)  $\frac{9\pi h^2}{8}$  sq. units.                      b)  $24\pi h^2$  sq. units.  
c)  $\frac{8\pi h^2}{9}$  sq. units.                      d)  $\frac{56\pi h^2}{9}$  sq. units.

**Part - B****II. Answer any 5 of the following questions:****5x2=10**

1.  $A = \begin{bmatrix} 5 & 2 & 2 \\ -\sqrt{17} & 0.7 & \frac{5}{2} \\ 8 & 3 & 1 \end{bmatrix}$  then Verity  $(A^T)^T = A$ .
2. A man goes 18m due east and then 24m due north. Find the distance of his current position from the starting point?
3. state Ceva's Theorem

- A kite is flying at a height of 75m above the ground. The String attached to the kite is temporarily tied to a point on the ground The Inclination of the string with the ground is  $60^\circ$  Find the length of the string. assuming that there is no slack in the string.
- From the top of a rock 50  $\sqrt{3}$  m high, the angle of depression of a car on the ground is observed to be  $30^\circ$ . Find the distance of the car from the rock.
- The radius and height of a cylinder are in the ratio 5:7 and Its curved surface area is 5500 sq.cm find its radius and height.
- The Volume of a solid right circular cone is  $11088 \text{ cm}^3$ . If its height is 24 cm then find the radius of the cone.

### Part - C

#### II. Answer any 5 of the following questions:

5x5=25

- Find x and y if  $x+y = \begin{bmatrix} 7 & 0 \\ 3 & 5 \end{bmatrix}$  and  $x-y = \begin{bmatrix} 3 & 0 \\ 0 & 4 \end{bmatrix}$
- 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  $(AB)$ .
- state and prove Baudhayana theorem.
- Two ships are sailing in the sea on either sides of a lighthouse. The angle of elevation of the top of the lighthouse as observed from the ships are  $30^\circ$  and  $45^\circ$  respectively. If the lighthouse is 200m high, find the distance between the two ships
- The angle of elevation of the top of a cell phone tower from the foot of a high apartment is  $60^\circ$  and the angle of depression of the foot of the tower from the top of the apartment is  $30^\circ$  If the height of the apartment is 50 m, find the height of the cell phone tower. According to radiations control norms, the minimum height of a cell phone tower should be 120 m. state If the height of the above mentioned cell phone tower meets the radiation norms
- An Industrial metallic bucket is in the shape of the frustram of a right circular cone whose top and bottom diameters are 10m and 4m and whose height is 4m. Find the curved and total surface area of the bucket.
- A container open at the top is in the form of a frustum of a cone of height 16 cm with radii of its lower and upper ends are 8 cm and 20 cm its respectively. find the cost of milk which can completely fill a container at the rate of 40 per litre.

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#### Answer any one of the following question:

1x8=8

- Draw a Circle of diameter 6cm 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)
- Draw the graph  $y = (x-1)(x+3)$  and hence solve  $x^2-x-6=0$