SOME APPLICATIONS OF TRIGONOMETRY CM100901

Very Short Answer Type Questions : **1 mark each**

1. The ratio of the length of a rod and its shadow is $1 : \sqrt{3}$. The altitude of the sun is :

(a) 30° (b) 45° (c) 60° (d) 90°

2. From the top of a cliff 50 m high the angle of elevation of a tower is found to be equal to the angle of depression of the foot of the tower. The height of the tower is :

(a) 50 m (b) 100 m (c) 125 m (d) 150 m

3. A pole 10 m high casts a shadow 10 m long on the ground, then the sun's elevation is :

(a) 60° (b) 45° (c) 30° (d) 90°

4. A tree 6 m tall casts a 4 m long shadow. At the same time a pole casts a shadow 10 m long. The height of the pole is :

(a) 40 m (b) 20 m (c) 15 m (d) 10 m

5. If the height and length of the shadow of a man are the same, then the angle of elevation of the sun is :

(a) 30° (b) 60° (c) 45° (d) 15°

Short Answer Type Questions : **2 marks each**

6. A tree breaks due to storm and the broken part bends so that the top of the tree touches the ground making an angle 30° with it. The distance between the foot of the tree to the point where the top touches the ground is 8 m. Find the height of the tree.

7. A person standing on the bank of the river observes that the angle subtended by a tree on the opposite bank is 60°, when he retreats 20 m from the bank, he finds the angle to be 30°, find the height of the tree.

8. An aeroplane, when 3000 m high, passes vertically above another plane at an instant when the angles of elevation of the two aeroplanes from the same point on the ground are 60° and 45° respectively. Find the vertical distance between the two aeroplanes.

Long Answer Type Questions : **3 marks each**

9. The shadow of a tower is 30 m long, when the sun's elevation is 30°. What is the length of the shadow, when sun's elevation is 60° ?

10. A man standing on the top of a multi-storey building, which is 30 m high, observes the angle of elevation of the top of a tower as 60° and the angle of depression of the base of the tower as 30°. Find the horizontal distance between the building and the tower. Also, find the height of the tower.

11. From the top of a 10 m tall tower the angle of depression of a point on a ground was found to be 60°. How far is the point from the base of the tower?

Very Long Answer Type Questions : **4 marks each**

12. A vertical tower stands on a horizontal plane and is surmounted by a vertical flagstaff of height h. At a point on the plane, the angles of elevation of the bottom and the top of the flagstaff are α and β respectively. Prove that the height of the tower $\frac{h\tan\alpha}{\tan\beta-\tan\alpha}$.

13. A tree standing on a horizontal plane is leaning towards east. At two points situated at distance a and b exactly due west of it, the angles of elevation of the top are α and β respectively. Prove that the height of the top of the tree from the ground is $\frac{(b-a)\tan\alpha\tan\beta}{\tan\alpha-\tan\beta}$.