M.M.: 18 **Time: 30 min**

General Instructions:

(i) There are 8 questions in this paper.

(ii) All questions are compulsory.

1. A kite is flying, attached to a thread which is $165\,\text{m}$ long. The thread makes an angle of 30° with the ground. Find the height of the kite from the ground, assuming that there is no slack in the thread. **[1]**

2. From the top of a rock, which rises vertically $150\,\text{m}$ out of water, the angle of depression of a boat is 30°. Find the distance of the boat from the base of the rock. **[1]**

3. Find the angular elevation of the sun when the shadow of a $10\,\text{m}$ long pole is $10\sqrt{3}$ metres. **[1]**

4. The length of the string between a kite and a point on the ground is 119 metres. If the string makes an angle θ with the ground such that $\tan\theta = \frac{15}{8}$, how high is the kite. **[2]**

5 An observer $1.5\,\text{m}$ tall is $28.5\,\text{m}$ away from a tower. The angle of elevation of the top of the tower from his eyes is 45°. What is the height of the tower? **[3]**

6. The shadow of a tower standing on a level ground is found to be $40\,\text{m}$ longer when the sun's altitude is 30° than when it is 60°. Find the height of the tower. **[3]**

7. A tree breaks due to storm and the broken part bends so that the top of the tree touches the ground making an angle of 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. **[3]**

8. An aeroplane is flying at a height $2500\,\text{m}$ above the ground. From a point on the ground the angle of elevation of this aeroplane was found to be 60°. If after 15 seconds of horizontal flight, the angle of elevation changes to 30°, find the speed of the aeroplane. **[3]**