

Chapter 9 Application of Trigonometry

UNIT TEST

Duration: 1 hour

Marks: 30

SECTION A

Each carry 1 mark

1. If the elevation of the sun changes from 30° to 60° then the difference between the lengths of shadows of a pole 15 m high, is

- a) 7.5m b) 15m c) $10\sqrt{3}$ m d) $5\sqrt{3}$ m

2. If the angles of elevation of a tower from two points distant a and b ($a > b$) from its foot and in the same straight line from it are 30° and 60° respectively, then the height of the tower is:

- a) $\sqrt{a+b}$ b) $\sqrt{ab}$ c) $\sqrt{a-b}$ d) $\sqrt{a} + \sqrt{b}$

3. 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°

4. Assertion (A): When we move towards the object, angle of elevation decreases.

Reason (R): As we move towards the object, it subtends large angle at our eye than before.

- (a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).
(b) Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).
(c) Assertion (A) is true but Reason (R) is false.
(d) Assertion (A) is false but Reason (R) is true.

SECTION B

Each carry 2 marks

5. An observer, 1.7 m tall, is $20\sqrt{3}$ m away from a tower. The angle of elevation from the eye of observer to the top of tower is 30° . Find the height of tower.

6. From a point P on the ground the angle of elevation of the top of a 10 m tall building is 30° . A flag is hosted at the top of the building and the angle of elevation of the top of the flagstaff from P is 45° . Find the length of the flagstaff. [Take $\sqrt{3} = 1.732$]
7. The angle of elevation of the top of a tower at a point on the ground is 30° . What will be the angle of elevation, if the height of the tower is tripled?

SECTION C

Each carry 3 marks

8. Two pillars of equal heights stand on either side of a road which is 100 m wide. At a point on the road between the pillars, the angles of elevation of the tops of the pillars are 60° and 30° . Find the height of each pillar and position of the point on the road. [Take $\sqrt{3} = 1.732$]
9. A boy standing on a horizontal plane finds a bird flying at a distance of 100 m from him at an elevation of 30° . A girl standing on the roof of 20-metre-high building finds the angle of elevation of the same bird to be 45° . Both the boy and the girl are on opposite sides of the bird. Find the distance of bird from the girl.

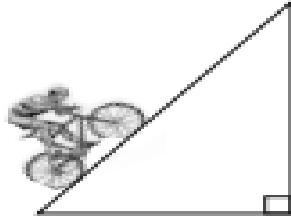
SECTION D

Each carry 5 marks

10. The angles of depression of the top and bottom of an 8 m tall building from the top of a multi-storeyed building are 30° and 45° respectively. Find the height of the multi-storeyed building and the distance between the two buildings.
11. The angle of elevations of an aeroplane from a point on the ground is 60° . After a flight of 15 seconds the angle of elevation changes to 30° . If the aeroplane is flying at a constant height of $1500\sqrt{3}$ m, find the speed of the aeroplane in km/hr.

SECTION E

12. A cyclist is climbing through a 20 m long rope which is highly stretched and tied from the top of a vertical pole to the ground as shown below.



Based on the above information, answer the following questions.

- i) Find the height of the pole, if angle made by rope with the ground level is 60° .
- ii) If the angle made by the rope with the ground level is 60° , then find the distance between artist and pole at ground level.
- iii) If the angle made by the rope with the ground level is 45° . Find the height of the pole.
- iv) If the angle made by the rope with the ground level is 45° and 3 m rope is broken, then find the height of the pole.

UNIT TEST

1. c) $10\sqrt{3}\text{m}$

2. b) $\sqrt{ab}$

3. b) 60°

4. (d) Assertion (A) is false but reason (R) is true.

5. 21.7m

6. 7.32 m

7. 60°

8. 43.3m

9. $30\sqrt{2}$

10. 18.93 m

11. 720 km/hr.

12. i) $10\sqrt{3}\text{m}$

ii) 10m

iii) $10\sqrt{2}\text{m}$

iv) $\frac{17}{\sqrt{2}}\text{m}$