CHAPTER-9 | Application of Trigonometry

QUIZ-01

1. What is the angle formed by the line of sight with the horizontal when we raise our head to look at an object?
   A. Angle of depression B. Angle of elevation
   C. Horizontal angle D. Vertical angle (B)

Explanation : The angle of elevation is formed when the line of sight is above the horizontal level.

2. Which trigonometric ratio is used to calculate height when angle of elevation and base are known?
   A. sin B. tan
   C. cos D. cot (B)

Explanation : tan θ = height/base is used to find the opposite side when angle and adjacent side are known.

3. If the angle of elevation is 60° and base is 15 m, what is the height of the tower?
   A. $10\sqrt{3}$ m B. $15\sqrt{3}$ m
   C. $20\sqrt{3}$ m D. 30 m (B)

Explanation : Using tan 60° = $\sqrt{3}$ = height/base → height = $15\sqrt{3}$ m.

4. What is the length of the ladder if it makes an angle of 60° with the ground and reaches 3.7 m height?
   A. 3.5 m B. 4.28 m
   C. 4.5 m D. 5 m (B)

Explanation : sin 60° = 3.7/ladder → ladder = 3.7/sin 60° = 4.28 m (approx).

5. What is the angle of depression when the object viewed is below the horizontal level?
   A. 90° B. 0°
   C. Angle of depression
   D. Angle of elevation (C)

Explanation : When the object is below the horizontal, the angle formed is the angle of depression.

6. If the angle of elevation of the top of a chimney is 45° and distance from observer is28.5 m, what is its height (observer height = 1.5 m)?
   A. 26 m B. 28.5 m
   C. 30 m D. 31 m (C)

Explanation : tan 45° = 1 → height = 28.5 + 1.5 = 30 m.

7. What is the relation used in a right triangle to calculate distance when height and angle are given using cotangent?
   A. cot θ = base/height
   B. cot θ = height/base
   C. cot θ = hypotenuse/base
   D. cot θ = base/hypotenuse (A)

Explanation : cot θ is defined as adjacent/opposite = base/height.

8. What is the formula used to calculate height when the angle of depression is 30° and base is known?
   A. tan 30° = height/base
   B. cot 30° = base/height
   C. tan 30° = base/height
   D. cot 30° = height/base (A)

Explanation : tan 30° = height/base is the relation used to find vertical height.

9. What will be the width of a river if angles of depression from a bridge are 30° and 45°, and bridge is 3 m high?
   A. 3 m B. 6 m
   C. $3(1 + \sqrt{3})$ m D. $3\sqrt{2}$ m (C)

Explanation : Using geometry:
AB = AD + DB = $3 + 3\sqrt{3} = 3(1 + \sqrt{3})$ m.

10. In which case is angle of depression used instead of angle of elevation?
    A. When object is at a higher level
    B. When object is at eye level
    C. When object is at a lower level
    D. None of these (C)

Explanation : Angle of depression is used when the observer looks down at an object.