Important Assertion And Reason Questions On Some Applications of Trigonometry

Directions: In the following questions a statement of assertion (A) is followed by a statement of reason(R). Mark the correct choice as:

Choose the correct option for the following questions:

- (A). Both Assertion (A) and Reason (R) are true, and Reason is the correct explanation of Assertion.
- (B). Both Assertion (A) and Reason (R) are true, but Reason is not the correct explanation of Assertion.
- (C). Assertion (A) is true, but Reason (R) is false.
- (D). Assertion (A) is false, but Reason (R) is true.

Question 1:

Assertion (A): Trigonometry is used to find heights and distances indirectly.

Reason (R): Direct measurement is sometimes difficult or impossible.

Options:

(A). Both A and R are true, and R is the correct explanation of A.
(B). Both A and R are true, but R is not the correct explanation of A.
(C). A is true, but R is false.
(D). A is false, but R is true.

Correct Answer: (A). Both A and R are true, and R is the correct explanation of A.

Question 2:

Assertion (A): The angle formed by looking upward at an object is called the angle of elevation.

Reason (R): The object is above the observer's eye level.

Options:

(A). Both A and R are true, and R is the correct explanation of A.
(B). Both A and R are true, but R is not the correct explanation of A.
(C). A is true, but R is false.
(D). A is false, but R is true.

Correct Answer: (A). Both A and R are true, and R is the correct explanation of A.

Question 3:

Assertion (A): The angle formed by looking downward at an object is called the angle of depression.

Reason (R): The object is below the observer's eye level.

Options:

(A). Both A and R are true, and R is the correct explanation of A.
(B). Both A and R are true, but R is not the correct explanation of A.
(C). A is true, but R is false.
(D). A is false, but R is true.

Correct Answer: (A). Both A and R are true, and R is the correct explanation of A.

Question 4:

Assertion (A): To find the height of a tower, trigonometric ratios can be used.

Reason (R): A right triangle is formed between the observer, the object, and the ground.

Options:

(A). Both A and R are true, and R is the correct explanation of A.
(B). Both A and R are true, but R is not the correct explanation of A.
(C). A is true, but R is false.
(D). A is false, but R is true.

Correct Answer: (A). Both A and R are true, and R is the correct explanation of A.

Question 5:

Assertion (A): The ratio used to find height when the base and angle are known is tangent.

Reason (R): Tangent ratio is: $\tan\theta = \text{PerpendicularBase}$

Options:

(A). Both A and R are true, and R is the correct explanation of A.
(B). Both A and R are true, but R is not the correct explanation of A.
(C). A is true, but R is false.
(D). A is false, but R is true.

Correct Answer: (A). Both A and R are true, and R is the correct explanation of A.

Question 6:

Assertion (A): The height of a building can be calculated using the angle of elevation and horizontal distance.

Reason (R): The building, ground, and line of sight form a right triangle.

Options:

(A). Both A and R are true, and R is the correct explanation of A.
(B). Both A and R are true, but R is not the correct explanation of A.
(C). A is true, but R is false.
(D). A is false, but R is true.

Correct Answer: (A). Both A and R are true, and R is the correct explanation of A.

Question 7:

Assertion (A): Angle of elevation is always measured from the horizontal line upward.

Reason (R): The observer looks above the horizontal level.

Options:

(A). Both A and R are true, and R is the correct explanation of A.
(B). Both A and R are true, but R is not the correct explanation of A.
(C). A is true, but R is false.
(D). A is false, but R is true.

Correct Answer: (A). Both A and R are true, and R is the correct explanation of A.

Question 8:

Assertion (A): Angle of depression and angle of elevation are equal in many problems.

Reason (R): They are alternate interior angles formed by parallel horizontal lines.

Options:

(A). Both A and R are true, and R is the correct explanation of A.
(B). Both A and R are true, but R is not the correct explanation of A.
(C). A is true, but R is false.
(D). A is false, but R is true.

Correct Answer: (A). Both A and R are true, and R is the correct explanation of A.

Question 9:

Assertion (A): If the angle of elevation increases, the height of the object appears greater for the same distance.

Reason (R): The value of tangent increases as the angle increases from (0^\circ) to (90^\circ).

Options:

(A). Both A and R are true, and R is the correct explanation of A.
(B). Both A and R are true, but R is not the correct explanation of A.
(C). A is true, but R is false.
(D). A is false, but R is true.

Correct Answer: (A). Both A and R are true, and R is the correct explanation of A.

Question 10:

Assertion (A): The line joining the observer's eye and the top of the object is called the line of sight.

Reason (R): The line of sight helps form a right triangle in trigonometric problems.

Options:

(A). Both A and R are true, and R is the correct explanation of A.
(B). Both A and R are true, but R is not the correct explanation of A.
(C). A is true, but R is false.
(D). A is false, but R is true.

Correct Answer: (B). Both A and R are true, but R is not the correct explanation of A.

Question 11:

Assertion (A): The horizontal distance between the observer and the object forms the base of the right triangle.

Reason (R): The ground is considered horizontal in most trigonometric application problems.

Options:

(A). Both A and R are true, and R is the correct explanation of A.
(B). Both A and R are true, but R is not the correct explanation of A.
(C). A is true, but R is false.
(D). A is false, but R is true.

Correct Answer: (A). Both A and R are true, and R is the correct explanation of A.

Question 12:

Assertion (A): To calculate the height of a tree, one may use: $\tan\theta = \frac{h}{d}$

Reason (R): Here, (h) represents the height and (d) represents the horizontal distance.

Options:

(A). Both A and R are true, and R is the correct explanation of A.
(B). Both A and R are true, but R is not the correct explanation of A.
(C). A is true, but R is false.
(D). A is false, but R is true.

Correct Answer: (A). Both A and R are true, and R is the correct explanation of A.

Question 13:

Assertion (A): The observer's height may need to be added while calculating the total height of an object.

Reason (R): Angles are usually measured from the observer's eye level.

Options:

(A). Both A and R are true, and R is the correct explanation of A.
(B). Both A and R are true, but R is not the correct explanation of A.
(C). A is true, but R is false.
(D). A is false, but R is true.

Correct Answer: (A). Both A and R are true, and R is the correct explanation of A.

Question 14:

Assertion (A): Applications of trigonometry are used in navigation, surveying, and construction.

Reason (R): These fields require indirect measurement of distances and heights.

Options:

(A). Both A and R are true, and R is the correct explanation of A.
(B). Both A and R are true, but R is not the correct explanation of A.
(C). A is true, but R is false.
(D). A is false, but R is true.

Correct Answer: (A). Both A and R are true, and R is the correct explanation of A.

Question 15:

Assertion (A): If the distance from the observer to a tower remains fixed, increasing the angle of elevation increases the calculated height.

Reason (R): The value of tanθ increases with increase in θ .

Options:

(A). Both A and R are true, and R is the correct explanation of A.
(B). Both A and R are true, but R is not the correct explanation of A.
(C). A is true, but R is false.
(D). A is false, but R is true.

Correct Answer: (A). Both A and R are true, and R is the correct explanation of A.