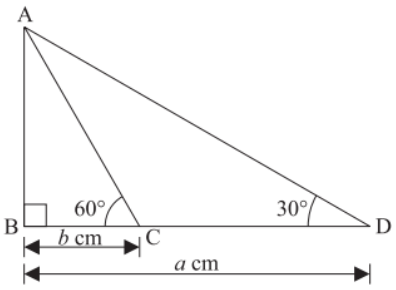
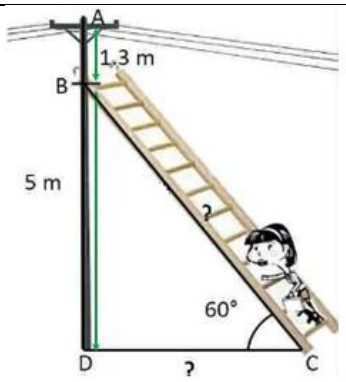
Department of Mathematics	**Class X**, Mathematics **APP. OF TRIGONOMETRY WORKSHEET**_011225

OBJECTIVE TYPE (1 Mark)

Q.1.	The angle of elevation of a ladder leaning against a wall is 60° and the foot of the ladder is 12.4 m away from the wall, then the length of the ladder is							
	A	14.8 m	**B**	6.2 m	**C**	12.4 m	**D**	24.8 m
Q.2.	At some time of the day, the length of the shadow of a tower is equal to its height. Then, the Sun's altitude at that time is							
	A	30°	**B**	45°	**C**	60°	**D**	90°
Q.3.	The tops of two poles of height 20 m and 15 m are connected by a wire of length x metres. If the wire makes an angle of 30° with the horizontal, then x equal to							
	A	10 m	**B**	20 m	**C**	16 m	**D**	12 m
Q.4.	The angle of elevation of the top of a tower from a point on the ground is 30°. If the distance of the point from the base of the tower is 50 m, the height of the tower is							
	A	$50\sqrt{3}\,m$	**B**	$100\sqrt{3}\,m$	**C**	$\frac{50}{\sqrt{3}}\,m$	**D**	$\frac{25\sqrt{3}}{3}\,m$
Q.5.	If a pole 6m high casts a shadow $2\sqrt{3}$ long on the ground, then the Sun's elevation is							
	A	60°	**B**	45°	**C**	30°	**D**	90°
Q.6.	A 1.6m tall girl stands at distance of 3.2m from a lamp post and casts a shadow of 4.8m on the ground, then the height of the lamp post is							
	A	8 m	**B**	4 m	**C**	6 m	**D**	$\frac{8}{3}$ m
Q.7.	A kite is flying at a height of 60 m from the ground. The string of the kite makes an angle of 60° with the ground. The length of the string is							
	A	$40\sqrt{3}\,m$	**B**	$\frac{40}{\sqrt{3}}\,m$	**C**	$120\sqrt{3}\,m$	**D**	$60\sqrt{3}\,m$
Q.8.	The angle of depression of a boat from the top of a lighthouse 100 m high is 45°. The distance of the boat from the lighthouse is							
	A	400 m	**B**	200 m	**C**	50 m	**D**	100 m
Q.9.	If a 30 m ladder is placed against a 15 m wall such that it just reaches the top of the wall, then the elevation of the wall is							
	A	45°	**B**	30°	**C**	60°	**D**	50°

Q.10.	A person standing on the bank of a river observes that the angle of elevation of the top of a tree on the opposite bank is 60°. If the height of the tree is 10 m, the width of the river is							
	A	$\frac{30}{\sqrt{3}}\ m$	**B**	$\frac{10}{3\sqrt{3}}\ m$	**C**	$\frac{10}{\sqrt{3}}\ m$	**D**	$\frac{3\sqrt{3}}{10}\ m$
	ASSERTION AND REASONING							
	DIRECTION: A statement of **Assertion (A)** is followed by a statement of **Reason (R).** Choose the correct option. (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 and 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.							
Q.11.	Assertion(A): If the angle of elevation of Sun, above a perpendicular line (tower) decreases, then the shadow of tower increases. Reason(R): It is due to decrease in slope of the line of sight.							
	Questions of 2 marks each							
Q.12.	Johnny was flying a kite last weekend. He wants to know how high the kite was flying, but all he knows is that he was holding the kite handle three feet from the ground, the kite string was 100 feet long, and the angle was 30 degrees. Use the given information to determine how high the kite was flying.							
Q.13.	Find the length of the shadow on the ground of a pole of height 54 m when angle of elevation θ of the sun is such that $tan\theta = \frac{6}{7}$.							
Q.14.	The shadow of a tower, when the angle of elevation of the sun is 45°, is found to be 10 m longer than when it was 60°. Find the height of the tower. (Use $\sqrt{3}$ = 1.732)							
	Questions of 3 marks each							
Q.15.	From a point on the ground the angles of elevation of the bottom and top of a water tank kept at the top of 24 m high tower are 30° and 60°. Find the height of the water tank.							
Q.16.	If the angles of elevation of the top of the candle from two coins distant 'a' cm and 'b' cm (a > b) from its base and in the same straight line from it are 30° and 60°, then find the height of the candle.  							
Q.17.	A vertical tower of height 20 m stands on a horizontal plane and is surmounted by a vertical flag staff of height h. At a point on the plane, the angle of elevation of the bottom and top of the flag staff are 45° and 60° respectively. Find the value of h.							
Q.18.	A man standing on the deck of a ship, which is 10 m above water level, observes the angle of elevation of the top of a hill as 60° and the angle of depression of the base of the hill as 30°. Find the distance of the hill from the ship and the height of the hill.							
Q.19.	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.							

	Questions of 5 marks each
Q.20.	A man on the top of a vertical tower observes a car moving at a uniform speed coming directly towards it. If it takes 20 minutes for the angle of depression to change from 45° to 60°, how soon after this will the car reach the observation tower? (Use $\sqrt{3}$ = 1.732).
Q.21.	An aeroplane, when flying at a height of 4000 m from the ground passes vertically above another aeroplane at an instant when the angles of elevation of the two planes from the same point on the ground are 60° and 45° respectively. Find the vertical distance between the aeroplanes at that instant. [Take $\sqrt{3}$= 1.73]
Q.22.	The angle of elevation of a cloud from a point 60 m above a lake is 30° and the angle of depression of the reflection of cloud in the lake is 60°. Find the height of the cloud.
Q.23.	The angles of depression of the top and bottom of a 50 m high building from the top of a tower are 45° and 60° respectively. Find the height of the tower and the horizontal distance between the tower and the building.
	CASE STUDY QUESTION: An electrician has to repair an electric fault on a pole of height 5m. She needs to reach a point 1.3m below the top of the pole to undertake the repair work. (Use $\sqrt{3} = 1.73$). Based on the above information, answer the following questions. 
Q.24.	What is the length of BD?
Q.25.	What should be the length of ladder, when inclined at an angle of 60° to the horizontal?
Q.26.	How far from the foot of pole should she place the foot of the ladder?
Q.27.	If the horizontal angle is changed to 30°, then what should be the length of ladder?
Q.28.	What is the value of $\angle B$ (from figure)?

ANSWERS

	Q.1.	D	**Q.2.**	B	**Q.3.**	A	**Q.4.**	C
	Q.5.	A	**Q.6.**	D	**Q.7.**	A	**Q.8.**	D
	Q.9.	B	**Q.10.**	C	**Q.11.**	a	**Q.12.**	53 feet
	Q.13.	63 m	**Q.14.**	23.66 m	**Q.15.**	48 m	**Q.16.**	h=$\sqrt{ab}$ *metre*
	Q.17.	$20(\sqrt{3}-1)\ m$	**Q.18.**	$10\sqrt{3}$ m, 40m	**Q.19.**	$8\sqrt{3}$ m	**Q.20.**	27.32 minutes
	Q.21.	1690 m (approximate)	**Q.22.**	120 m	**Q.23.**	118.30 m, 68.30 m (approximate)	**Q.24.**	3.7 m
	Q.25.	4.27 m	**Q.26.**	2.14 m	**Q.27.**	7.4 m	**Q.28.**	30°

****