ASSIGNMENT (MATHEMATICS) CLASS X

SOME APPLICATIONS OF TRIGONOMETRY

Q1.M.C.Q

a) Find the angle of elevation of the top of a tree of height $200\sqrt{3}$ at a point at a distance of 200m from the base of the tree

i)30°   ii)45°   iii)60°   iv)none of these

b) The angle of elevation of the top of a tower from a point situated at a distance of 100 m from the base of a tower is 30°.The height of the tower is

i) $100/\sqrt{3}$ ii)$100\sqrt{3}$ iii)$50/\sqrt{3}$ iv)$50\sqrt{3}$

c)The angles of elevation of two points at distances a and b in a horizontal line through the base of the tower ,of the top of the tower are complementary to each other. Then height of tower is

i) a+b   ii)ab   iii)$\sqrt{ab}$ iv)2ab

d)The length of the shadow of a tower is equal to its height .The angle of elevation of the sun is

i)30°   ii)45°   iii)60°   iv)90°

e)A pole 6m high casts a shadow $2\sqrt{3}$ m long on the ground, then the sun's elevation is

i)60°   ii) 45°   iii)30°   iv)90°

Q2.The angle of elevation of a cloud from a point 120m above a lake is 30° and the angle of depression of its reflection in the lake is 60°.Find the height of the cloud.

Q3. From the top of a hill, the angles of depression of two consecutive 1 km stones due west are found to be 30° and 45°.Find the height of the hill.

Q4.The shadow of a tower ,when the angle of elevation of the sun is 45° is found to be 10 metres longer than when it was 60°.Find the height of the tower.

Q5.A bird is sitting on the top of a tree ,which is 80m high.The angle of elevation of the bird ,from a point on the ground is 45°.The bird flies away from the point of observation horizontally and remains at a constant height .After 2 seconds ,the angle of elevation of the bird from the point of observation becomes 30°.Find the speed of flying of the bird.

Q6.The angles of elevation of the top of a tower ,as seen from two points A and B situated in the same line and at distances a and b respectively from the foot of the tower ,are complementary .Prove that height of tower is $\sqrt{ab}$.

Q7.An aero plane when 3000m high ,passes vertically above another aeroplane at an instant when the angles of elevation of the two aeroplanes from the same point on the ground are 60° and 45°respectively.Find the vertical distance between the two planes.

HOTS

Q8. A tower subtends an angle α at appoint A in the plane of its base and the angle of depression of the foot of the tower at a point b metre just above A is β. Prove that height of tower is b tan α cot β.

Q9. A round balloon of radius r subtends an angle α at the eye of the observer while the angle of elevation of its centre is β.Prove that height of the centre of the balloon is r sin β cosec$\frac{\alpha}{2}$.

Q10.A ladder rest against a vertical wall at an inclination α to the horizontal.Its foot is pulled away from the wall through a distance p so that its upper end slides a distance q down the wall and then ladder makes an angle β to the horizontal ,show that

$$\frac{p}{q} = \frac{cos\beta - cos\alpha}{sin\alpha - sin\beta}$$

Q11.From a window h metres high above the ground of a house in a street the angles of elevation and depression of the top and foot of another house on the opposite side of the street are θ and $\emptyset$ respectively .Show that height of the opposite house is h(1+tan θ cot $\emptyset$)

Q12.If the angle of elevation of a cloud from a point h metres above a lake is α and the angle of depression of its reflection in the lake is β,prove that the height of cloud is

$h\left(\frac{tan\beta+tan\alpha}{tan\beta-tan\alpha}\right).$

Q13. At the foot of the mountain the elevation of its summit is 45°.After ascending 1 km towards the mountain at an inclination of 30°,the elevation is 60°.How much high is the mountain ?

VALUE BASED QUESTIONS

Q14.A person standing on the bank of a river observes that the angle of elevation of the top of a building of an organization working for conservation of wild life ,standing on the opposite bank is 60°.When he moves 40 metres away from the bank ,he finds the angle of elevation to be 30°.Find the height of the building and the width of river.

a)Why do we need to conserve wildlife?

b)Suggest some steps that can be taken to conserve wildlife.

Q15.From a point on the ground ,the angle of elevation of the top of a 10 m high building is 30°.On the Independence day ,the national flag was hoisted at the top of of the building .The angle of elevation of the top of the flag from the same point on the ground was found to be 45°.Find the length of the flag. What value is indicated from the above?