I. ANSWER THE FOLLOWING
$10 \times 2=20$

1. Prove that $\sqrt{\frac{1+\sin \theta}{1-\sin \theta}}=\sec \theta+\tan \theta$
2. Prove that $\sqrt{\frac{1+\cos \theta}{1-\cos \theta}}=\operatorname{cosec} \theta+\cot \theta$
3. Find the angle of elevation of the top of a tower from a point on the ground, Which is 30 m away from the foot of a tower of height $10 \sqrt{3} \mathrm{~m}$.
4. A tower stands vertically on the ground. From a point on the ground, Which is 48 m away from the foot of the tower, the angle of elevation of top of the tower is $30^{\circ}$. Find the height of the tower.
5. A player sitting on the top of a tower of height 20 m observe the angle of depression of a ball lying on the ground as $60^{\circ}$. Find the distance between the foot of the tower and the ball. $(\sqrt{3}=1.732)$
6. From the top of a rock $50 \sqrt{3} \mathrm{~m}$ high, the angle of depression of a car on the ground is observed to be $30^{\circ}$. Find the distance of the car from the rock.
7. Calculate the size of $A B C$ in the given triangles $\left(\tan 38.7^{\circ}=0.8011, \tan 69.4^{\circ}=2.6604\right)$
8. Prove that $\frac{\operatorname{Sin} A}{1+\operatorname{Cos} A}=\frac{1-\operatorname{Cos} A}{\operatorname{Sin} A}$

9. Prove that $\tan ^{4} \theta+\tan ^{2} \theta=\operatorname{Sec}^{4} \theta-\operatorname{Sec}^{2} \theta$.
10. A kite is flying at a height of 75 m above the ground. The string attached to the kite is temporarily tied to a point on the ground. The inclination of the string with the ground is $60^{\circ}$.Find the length of the string, assuming that there is no slack in the string.
II. ANSWER THE FOLLOWING $6 \times 5=30$
11. If $\cos \theta+\sin \theta=\sqrt{2} \cos \theta$, then Prove that $\cos \theta-\sin \theta=\sqrt{2} \sin \theta$
12. If $\operatorname{cosec} \theta+\cot \theta=P$, then Prove that $\cos \theta=\frac{P^{2}-1}{P^{2}+1}$
13. If $\sin \theta+\cos \theta=\sqrt{3}$, then Prove that $\tan \theta+\cot \theta=1$
14. To a man standing outside his house, the angle of elevation top and bottom of a window are $60^{\circ}$ and $45^{\circ}$ respectively. If the height of the man is 180 cm and if he is 5 m away from the wall, What is the height of the window? $(\sqrt{3}=1.732)$
15. From the top of the tower 60 m high the angles of depression of the top and bottom of the vertical lamp post are observed to be $38^{\circ}$ and $60^{\circ}$ respectively. Find the height of the lamp post.( $\tan 38^{\circ}=0.7813, \sqrt{3}=1.732$ )
16. From the top of the tree of height 13 m the angle of elevation and depression of the top and bottom of another tree are $45^{\circ}$ and $30^{\circ}$ respectively. Find the height of the second tree. $(\sqrt{3}=1.732)$
