F.M. → 30 marks

15/2/19

Maths Test :—

Q.1) Prove :— $(2\frac{1}{2} + 2\frac{1}{2} = 5)$

(i) $\sqrt{\frac{1+\cos A}{1-\cos A}} = \operatorname{cosec} A + \cot A$.

(ii) $\frac{1+\sec A}{\sec A} = \frac{\sin^2 A}{1-\cos A}$.

Q.2) Prove :— $\frac{\tan A + \sec A - 1}{\tan A - \sec A + 1} = \frac{1+\sin A}{\cos A}$. (4)

Q.3) A vertical pole and a vertical tower are on the same level ground. From the top of the pole, the angle of elevation of the top of the tower is 60° and the angle of depression of the foot of the tower is 30°. Find the height of the tower if the height of the pole is 20m. (4).

Q.4) A line AB joining the points A(−4, 6) and B(8, −3). Find :—

(i) the ratio in which AB is divided by the y-axis.
(ii) the co-ordinates of the point of intersection.
(iii) the length of AB. (4).

Q.5) Equation of a line is $3x + 4y - 7 = 0$. Find

(i) the slope of the line.
(ii) the equation of a line perpendicular to the given line and passing through the intersection of the lines $x - y + 2 = 0$ & $3x + y - 10 = 0$. (3)

a.6.) The shadow of a tower standing on a level ground is found to be 40m longer when the sun's altitude is 30° than when it is 60°. Find the height of the tower. (3)

a.7) Prove that:— (i). $\frac{\sin^3 A + \cos^3 A}{\sin A + \cos A} + \frac{\sin^3 A - \cos^3 A}{\sin A - \cos A} = 2$ (3)

(ii). $\sec^6 A - \tan^6 A = 1 + 3\tan^2 A + 3\tan^4 A$. (4)