

**CHOITHRAM SCHOOL MANIKBAGH INDORE****CLASS X Session : 2017-18**

SUBJECT: MATHS ASSIGNMENT No: 3

Allotment Date: 1/12/17

Submission Date:5/12/17

Q.no	Question	Marks	Levels
1.	If $\operatorname{cosec}^2\alpha(1+\cos\alpha)(1-\cos\alpha)=x$ , then find the value of x.	1	Knowledge
2.	In a triangle ABC, $\angle C=90^\circ$ , prove that $\operatorname{cosec}^2A - \tan^2B = 1$	1	Knowledge
3	If $\sqrt{3} \tan \beta = 3 \sin \beta$ , then find the value of $\sin^2 \beta - \cos^2 \beta$ .	1	Knowledge
<b>SHORT ANSWERS</b>			
4	If $\sec A = 2x$ and $\tan A = \frac{2}{x}$ , find the value of $2(x^2 - \frac{1}{x^2})$	2	Logic
5	Evaluate $\frac{\cot(90-\theta)\sin(90-\theta)}{\sin\theta} + \frac{\cot 40}{\tan 50} - (\cos^2 20 + \cos^2 70)$	2	Multi conceptual
6	At a point, the angle of elevation of a tower is such that its tangent is $\frac{5}{12}$ . On walking 240m nearer to the tower, the tangent of the elevation becomes $\frac{3}{4}$ . Find the height of the tower.	2	Knowledge
7	Prove the following identity $(\sin\theta - \sec\theta)^2 + (\cos\theta - \operatorname{cosec}\theta)^2 = (1 - \sec\theta \operatorname{cosec}\theta)^2$	2	Hots
8	The angle of elevation of the top Q of a vertical tower PQ from a point X on the ground is $60^\circ$ . From a point Y, 40m vertically above X, the angle of elevation of the top Q of tower is $45^\circ$ . Find the height of the tower PQ and the distance PX. (use $\sqrt{3} = 1.73$ )	3	Understanding
9	A fire at the building B is reported by a telephone to two fire stations $F_1$ and $F_2$ observe that the fire is at an angle of $60^\circ$ and $45^\circ$ respectively to the roads, which station should send its team and how much will it have to travel? They reached on time and saved many lives, comment on their act.	3	Value base
10	A boy standing on a horizontal plane finds a bird flying at a distance of 100m from him at an elevation of $30^\circ$ . A girl standing on the roof of 20 m high building, finds the angle of elevation of the same bird to be $45^\circ$ . Both the boy and the girl are on opposite side of the bird. Find the distance of bird from the girl.	3	Understanding
<b>LONG ANSWERS</b>			
11	Prove that $\frac{(1 + \cot\theta + \tan\theta)(\sin\theta - \cos\theta)}{\sec^3\theta - \operatorname{cosec}^3\theta} = \sin^2\theta \cos^2\theta$	5	Logic
12	A ladder rests against a vertical wall at an inclination $\alpha$ 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 the ladder makes an angle $\beta$ to the horizontal. Show that $\frac{P}{Q} = \frac{\cos\beta - \cos\alpha}{\sin\alpha - \sin\beta}$	5	Multi Conceptual