

(Maths)

## SSC MAINS - TRIGONOMETRY



### Some important Question:

**1. If  $\cos A + \cos^2 A = 1$ , then the value of  $\sin^2 A + \sin^4 A$  is :**

(SSC CGL TIER II -2012)

$$\cos A + \cos^2 A = 1,$$

$$\Rightarrow \cos A = 1 - \cos^2 A \Rightarrow \cos A = \sin^2 A$$

$$\therefore \sin^2 A + \sin^4 A = \sin^2 A + \cos^2 A = 1$$

**2. The value of  $\sin^2 1^\circ + \sin^2 5^\circ + \sin^2 9^\circ + \dots + \sin^2 89^\circ$**

(SSC CGL TIER II -2013)

$$G.E = (\sin^2 1^\circ + \sin^2 89^\circ) + (\sin^2 5^\circ + \sin^2 85^\circ) + (\sin^2 9^\circ + \sin^2 81^\circ) + \dots + \dots + (\sin^2 41^\circ + \sin^2 49^\circ) + \sin^2 45^\circ$$

$$= (\sin^2 1^\circ + \cos^2 1^\circ) + (\sin^2 5^\circ + \cos^2 5^\circ) + \dots + (\sin^2 41^\circ + \cos^2 41^\circ) + \left(\frac{1}{\sqrt{2}}\right)^2$$

$$1 + 1 + 1 + 1 \dots (11 \text{ times}) + \frac{1}{2}$$

$$11\frac{1}{2}$$

**3. If  $\tan 2\theta \tan 3\theta = 1$ , and  $\theta$  is a positive angle then the value of  $\left(2\cos^2 \frac{5\theta}{2} - 1\right)$**

(SSC CGL TIER II -2012)

$$\tan 2\theta \cdot \tan 3\theta = 1 \Rightarrow \tan 2\theta = \frac{1}{\tan 3\theta} = \cot 3\theta = \tan(90^\circ - 3\theta)$$

$$\Rightarrow 2\theta = 90^\circ - 3\theta \Rightarrow 5\theta = 90^\circ$$

$$\therefore \theta = 18^\circ$$