

## Comprehensive Test Series-02 Trigonometric Function

TIME: 1 hr.

MM: 30

### General Instructions:

- All Questions are compulsory.
  - Marks are given alongwith the questions individually.
  - Use of calculator is not permitted.
- 

Prove the following

$$\text{Q.1} \quad \cot^2 \frac{\pi}{6} + \operatorname{cosec} \frac{5\pi}{6} + 3 \tan^2 \frac{\pi}{6} = 6 \quad (3)$$

$$\text{Q.2} \quad 2 \sin^2 \frac{3\pi}{4} + 2 \cos^2 \frac{\pi}{4} + 2 \sec^2 \frac{\pi}{3} = 10 \quad (3)$$

$$\text{Q.3} \quad \frac{\tan\left(\frac{\pi}{4} + x\right)}{\tan\left(\frac{\pi}{4} - x\right)} = \left(\frac{1 + \tan x}{1 - \tan x}\right)^2 \quad (3)$$

$$\text{Q.4} \quad \frac{\cos(\pi + x)\cos(-x)}{\sin(\pi - x)\cos\left(\frac{\pi}{2} + x\right)} = \cot^2 x \quad (3)$$

$$\text{Q.5} \quad \cos\left(\frac{3\pi}{2} + x\right)\cos(2\pi + x)\left[\cot\left(\frac{3\pi}{2} - x\right) + \cot(2\pi + x)\right] = 1 \quad (3)$$

$$\text{Q.6} \quad \sin 2x + \sin 4x + \sin 6x = 4\cos^2 x \sin 4x \quad (3)$$

$$\text{Q.7} \quad \cot 4x (\sin 5x + \sin 3x) = \cot x (\sin 5x - \sin 3x) \quad (3)$$

$$\text{Q.8} \quad \frac{\sin x - \sin 3x}{\sin^2 x - \cos^2 x} = 2 \sin x \quad (3)$$

$$\text{Q.9} \quad \tan 4x = \frac{4 \tan x(1 - \tan^2 x)}{1 - 6 \tan^2 x + \tan^4 x} \quad (3)$$

$$\text{Q.10} \quad \cos 6x = 32 \cos^6 x - 48 \cos^4 x + 18 \cos^2 x - 1 \quad (3)$$