

# Mathematics

(www.tiwariacademy.in)

## (Chapter 2)(Inverse Trigonometric Functions)

(Class XII)

### (Exemplar Problems)

#### Objective Type Questions

Choose the correct answers from the given four options in the following (MCQ):

#### Question 36:

The number of real solutions of the equation  $\sqrt{1 + \cos 2x} = \sqrt{2} \cos^{-1}(\cos x)$  in  $\left[\frac{\pi}{2}, \pi\right]$  is

- (A) 0                      (B) 1                      (C) 2                      (D) Infinite

#### Answer 36:

- (A) 0

#### Solution:

Given that:  $\sqrt{1 + \cos 2x} = \sqrt{2} \cos^{-1}(\cos x)$  in  $\left[\frac{\pi}{2}, \pi\right]$

Now, we have

$$\sqrt{1 + \cos 2x} = \sqrt{2} \cos^{-1}(\cos x)$$

$$\Rightarrow \sqrt{1 + 2\cos^2 x - 1} = \sqrt{2} x \quad [\because \cos^{-1}(\cos x) = x]$$

$$\Rightarrow \sqrt{2\cos^2 x} = \sqrt{2} x$$

$$\Rightarrow \sqrt{2} \cos x = \sqrt{2} x$$

$$\Rightarrow \cos x = x$$

Which is not true for any real value of  $x$ .

Hence, the option (A) is correct.

