

Which of the following is the period of $f(x) = \sqrt{\frac{\sin x + \sin 2x}{1 + \cos x + \cos 2x}}$?

- (A) $\frac{\pi}{2}$ (B) π (C) 2π (D) Non-periodic

Solution

$$\text{The given function} = \sqrt{\frac{\sin x + \sin 2x}{1 + \cos x + \cos 2x}} = \sqrt{\frac{\sin x + 2 \sin x \cos x}{2 \cos^2 x + \cos x}}$$

$$\therefore f(x) = \sqrt{\frac{\sin x(1 + 2 \cos x)}{\cos x(2 \cos x + 1)}} = \sqrt{\tan x}$$

Since the period of $\tan x$ is π , period of $f(x) = \pi$.

Hence, (B).