

The minimum value of $9^{\sec(x)^2} + 9^{-\tan(x)^2}$

a)0 b)2 c)not defined d)6

SOLUTION :

By A.M.-G.M. relation,

$$\frac{9^{\sec^2 x} + 9^{-\tan^2 x}}{2} \geq \sqrt{9^{\sec^2 x} \cdot 9^{-\tan^2 x}}$$

$$\begin{aligned} 9^{\sec^2 x} + 9^{-\tan^2 x} &\geq 2\sqrt{9^{\sec^2 x - \tan^2 x}} \\ &\geq 2\sqrt{9} \\ &\geq 6 \end{aligned}$$

[FORMULA USED { $\sec^2 x - \tan^2 x = 1$ }]