In an $a.c.$ circuit the voltage applied is $E = E_0 \sin \omega t$. The resulting current in the circuit is $I = I_0 \sin\left(\omega t - \frac{\pi}{2}\right)$. The power consumption in the circuit is given by

A $P = \sqrt{2} E_0 I_0$

B $P = \frac{E_0 I_0}{\sqrt{2}}$

C $P = zero$

D $P = \frac{E_0 I_0}{2}$

Given, $E = E_0 \sin(\omega t)$

$$I = I_0 \sin\left(\omega t - \frac{\pi}{2}\right)$$

$\Delta\phi$ between E and I $\Rightarrow |\Delta\phi| = \left|\omega t - \left(\omega t - \frac{\pi}{2}\right)\right|$

$$|\Delta\phi| = \frac{\pi}{2} \Rightarrow \boxed{\cos\phi = 0}$$

Hence, $P_{consumed} = \left(\frac{E_0}{\sqrt{2}}\right)\left(\frac{I_0}{\sqrt{2}}\right)\cos\phi$

$$\boxed{P_{consumed} = 0}$$