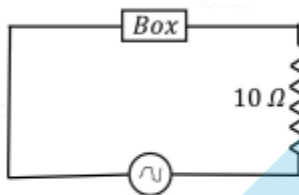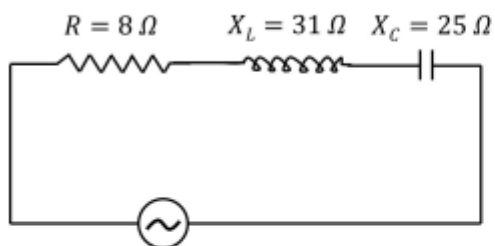1. In an AC circuit, the power factor

    A. is unity when the circuit contains an ideal resistor only.

    B. is zero when the circuit contains an ideal inductor only.

    C. Both options (A) and (B)

    D. None of these

2. In the circuit shown in the figure, the power factor of the box is 0.5 and the power factor of the circuit is $\sqrt{3}/2$. Current leads the voltage. Find the effective resistance of the box.
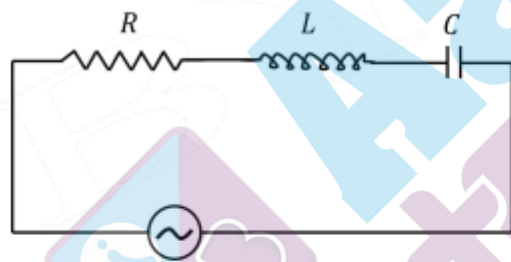

    A. $1\,\Omega$

    B. $3\,\Omega$

    C. $5\,\Omega$

    D. $7\,\Omega$

3. The given AC RLC circuit is connected to an AC source of $110\ \text{V};\ 50\ \text{Hz}$. The power factor of the circuit is -
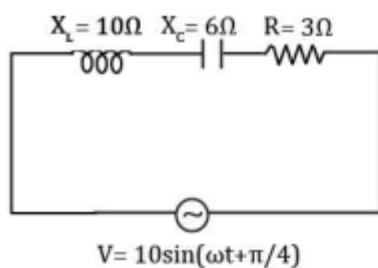
$R = 8\ \Omega$ $X_L = 31\ \Omega$ $X_C = 25\ \Omega$

A. 0.56

B. 0.64

C. 0.80

D. 0.33

4. For the given AC RLC circuit, at a particular frequency (f) of the AC source, the current leads the voltage by $45°$. The relation between R, L and C is -

R L C

A. $C = \dfrac{1}{2\pi f(2\pi fL - R)}$

B. $C = \dfrac{1}{2\pi f(2\pi fL + R)}$

C. $C = \dfrac{1}{\pi f(2\pi fL - R)}$

D. $C = \dfrac{1}{\pi f(2\pi fL + R)}$

5. For the given AC LCR circuit, at a particular frequency of the AC source, the expression for current (i) as a function of time (t) will be -

$X_L = 10\Omega$ $X_C = 6\Omega$ $R = 3\Omega$

V= 10sin(ωt+π/4)

A. $i = 4\sin(\omega t + 8°)$

B. $i = 4\sin(\omega t - 8°)$

C. $i = 2\sin(\omega t - 8°)$

D. $i = 2\sin(\omega t + 8°)$

1. (C)
2. (C)
3. (C)
4. (B)
5. (C)