

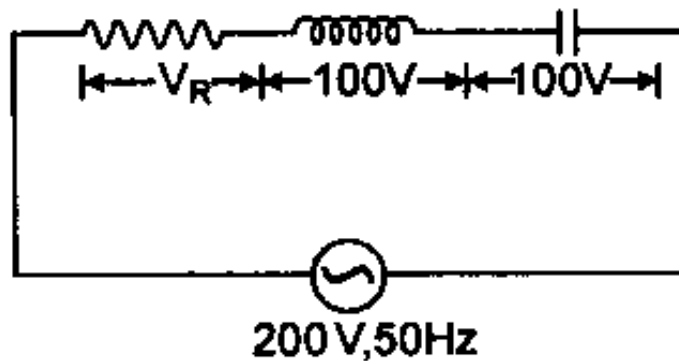
DPP – 2 (Alternating Current)

Video Solution on Website :- <https://physicsaholics.com/home/courseDetails/102>

Video Solution on YouTube:- <https://youtu.be/O3WmlqLxMJg>

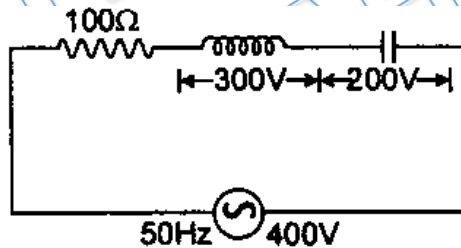
Written Solution on Website:- <https://physicsaholics.com/note/notesDetailis/60>

Q 1. In the circuit shown in figure current in the circuit is:



- (a) 1.27A (b) 2.23 A (c) 4.26 A (d) 3.87 A

Q 2. 110 V (rms) is applied across a series circuit having resistance 11Ω and impedance 22Ω . The power consumed is:



- (a) 275 W (b) 366 W (c) 550 W (d) 1100 W

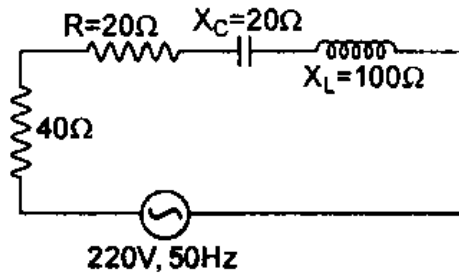
Q 3. At a frequency ω_0 the reactance of a certain capacitor equals that of a certain inductor. If the frequency is changed to $2\omega_0$, what is the ratio of the reactance of the inductor to that of the capacitor?

- (a) 4 : 1 (b) $\sqrt{2} : 1$ (c) 1 : $2\sqrt{2}$ (d) 1 : 2

Q 4. An alternating voltage given by $V = 300\sqrt{2} \sin(50t)$ (in volts) is connected across a $1\mu\text{F}$ capacitor through an AC ammeter. The reading of the ammeter will be:

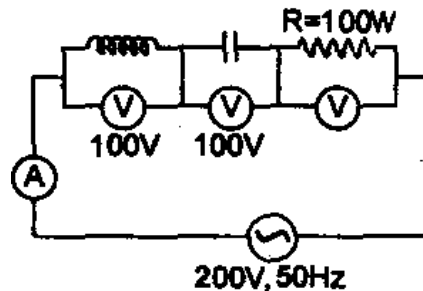
- (a) 10 mA (b) 40 mA (c) 100 mA (d) 15 mA

Q 5. The power factor of the circuit shown in the figure is:



- (a) 0.4 (b) 0.2 (c) 0.8 (d) 0.6

Q 6. What will be the reading of the voltmeter across the resistance and ammeter in the circuit shown in the figure?



- (a) 300 V, 2 A (b) 800 V, 2 A (c) 100 V, 2 A (d) 200 V, 2 A

Q 7. When 100 V. DC is applied across a solenoid a current of 1 A flows in it. When 100 V, AC is applied across the same coil, the current drops to 0.5 A. The frequency of the AC is 50 Hz. The impedance and inductance of the solenoid are:

- (a) 100 Ω, 0.75 H (b) 1000 Ω, 0.60 H
(c) 2000 Ω, 0.55 H (d) 2000 Ω, 0.75 H

Q 8. In a series LCR the voltage across resistance, capacitance and inductance is 10 V each. If the capacitance is short circuited, the voltage across the inductance will be:

- (a) $\frac{10}{\sqrt{2}}$ V (b) 10 V (c) $10\sqrt{2}$ V (d) 20 V

Q 9. Choose the wrong statement:

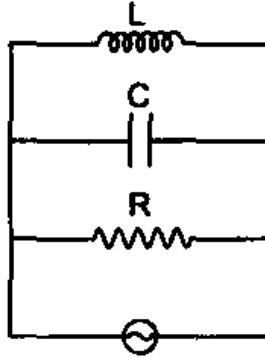
- (a) The peak voltage across the inductor can be greater than the peak voltage of the source in an LCR circuit.
(b) In a circuit containing a capacitor and an AC source the current is zero at the instant the source voltage is maximum.
(c) An AC source is connected to a capacitor. The rms current in the circuit gets increased if a dielectric slab is inserted into the capacitor.
(d) None of the above

Q 10. An AC source producing emf $V = V_0 [\sin \omega t + \sin 2\omega t]$ is connected in series with a capacitor and a resistor. The current found in the circuit is $i = i_1 \sin (\omega t + \phi_1) + i_2 \sin (2\omega t + \phi_2)$. Then :

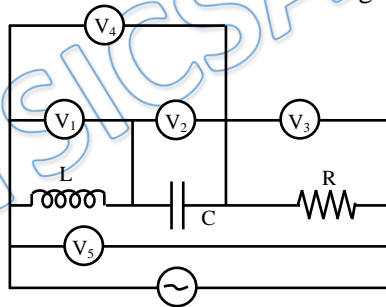
- (a) $i_1 = i_2$
(b) $i_1 < i_2$
(c) $i_1 > i_2$
(d) i_1 may be less than, equal to or greater than i_2



- Q 11. Figure shows a parallel LCR circuit connected to a 200 V, AC source. $L = 5H$, $C = 80 \mu F$ and $R = 40 \Omega$ at resonance let i_1 and i_2 be the rms current through L, C and R. Then:



- (a) $i_1 = i_2$ and $i_1 > i_2$ (b) $i_1 = 0 = i_2$
 (c) $i_1 = i_2$ and $i_1 < i_3$ (d) $i_1 = i_2$ and $i_3 > 0$
- Q 12. A 120 V, 60 W lamp is run from a 240V, 50 Hz mains supply using a capacitor connected in series with the lamp and supply. What is theoretical value of the capacitor required to operate the lamp at its normal rating?
 (a) $3.8 \mu F$ (b) $6.6 \mu F$ (c) $7.7 \mu F$ (d) $13.3 \mu F$
- Q 13. A series circuit has an impedance of 50.0Ω and a power factor of 0.63 at 60 Hz. The voltage lags the current. To raise the power factor of the circuit:
 (a) an inductor should be placed in series
 (b) a capacitor should be placed in series
 (c) a resistance should be placed in series
 (d) an inductor or a resistance should be placed in series
- Q 14. In the adjoining A.C. circuit the voltmeter whose reading will be zero at resonance is-



- (a) V_1 (b) V_2
 (c) V_3 (d) V_4



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Answer Key

Q.1 d	Q.2 a	Q.3 a	Q.4 d	Q.5 d
Q.6 d	Q.7 c	Q.8 a	Q.9 d	Q.10 b
Q.11 c	Q.12 c	Q.13 d	Q.14 d	