

Worksheet: Alternating Current

IB · Class 12 · Physics · 9 questions · 27 marks

Name: _____

Date: _____

Score: _____ / 27

Q1. The peak voltage of an ac supply is 400 V. Find the rms voltage, and find the peak current if the rms current is 5.0 A. *[2 marks]*

Q2. An inductor of 0.20 H is connected to a 50 Hz supply. Find its reactance. *[2 marks]*

Q3. A 50 ohm resistor is connected to a 220 V, 50 Hz supply. Find the rms current and the power dissipated. *[2 marks]*

Q4. A 100 microfarad capacitor is connected to a 110 V, 60 Hz supply. Find its reactance and the rms current. *[3 marks]*

Q5. A series circuit has $R = 30 \text{ ohm}$, $X_L = 60 \text{ ohm}$ and $X_C = 20 \text{ ohm}$. Find the impedance and the phase angle, and say whether the current leads or lags. *[3 marks]*

Q6. A series LCR circuit has $L = 2.0 \text{ H}$ and $C = 50 \text{ microfarad}$. Find the resonant angular frequency and the impedance at resonance if $R = 25 \text{ ohm}$. *[3 marks]*

Q7. A circuit draws 4.0 A rms from a 200 V rms supply with a phase angle of 60 degrees . Find the average power, the apparent power, and the wattless current. *[4 marks]*

Q8. A transformer has $200 \text{ primary turns}$ and $3000 \text{ secondary turns}$, with 220 V applied to the primary. If the secondary supplies 0.50 A , find the secondary voltage and the primary current for an ideal transformer. *[4 marks]*

Q9. A series LCR circuit with $R = 20 \text{ ohm}$, $L = 1.5 \text{ H}$ and $C = 35 \text{ microfarad}$ is driven at its resonant frequency by a 200 V supply. Find the power absorbed. *[4 marks]*
