Ch—07 Alternating Current

Daily Practice Problem 08

Q1. A $1.0\ \mu F$ capacitor is charged by a $40.0\ V$ power supply. The fully charged capacitor is then discharged through a $10.0\ mH$ inductor. Find the maximum current in the resulting oscillations.

Q2. A $10\ \mu F$ capacitor is charged to a potential of $25\ V$. The battery is then disconnected and pure $100\ mH$ coil is connected across the capacitor so that LC-oscillations are set up. Calculate the maximum current in the coil.

Q3. A $1.5\ mH$ inductor in an LC-circuit stores a maximum energy of $30\ \mu J$. What is the maximum current in the circuit?

Q4. In an oscillatory circuit, the self-inductance of the coil used is $10\ mH$. If the oscillatory frequency of the circuit is $1.0\ MHz$, find the capacitance of the capacitor connected in the circuit.

Q5. A wave of wavelength $300\ m$ can be radiated through a transmitter. A capacitor of capacitance $2.4\ \mu F$ is available. What is the inductance of the coil required for the oscillatory circuit?

ANSWERS

1. $40.0\ mA$

2. $0.25\ A$

3. $0.2\ A$

4. $2.53\ \mu F$

5. $1.056 \times 10^{-8} H$