

3. (a) All the energy in the circuit resides in the capacitor when it has its maximum charge. The current is then zero. If Q is the maximum charge on the capacitor, then the total energy is

$$U = \frac{Q^2}{2C} = \frac{(2.90 \times 10^{-6} \text{ C})^2}{2(3.60 \times 10^{-6} \text{ F})} = 1.17 \times 10^{-6} \text{ J} .$$

- (b) When the capacitor is fully discharged, the current is a maximum and all the energy resides in the inductor. If I is the maximum current, then $U = LI^2/2$ leads to

$$I = \sqrt{\frac{2U}{L}} = \sqrt{\frac{2(1.168 \times 10^{-6} \text{ J})}{75 \times 10^{-3} \text{ H}}} = 5.58 \times 10^{-3} \text{ A} .$$