

11. (a) $Q = CV_{\text{max}} = (1.0 \times 10^{-9} \text{ F})(3.0 \text{ V}) = 3.0 \times 10^{-9} \text{ C}.$

(b) From $U = \frac{1}{2}LI^2 = \frac{1}{2}Q^2/C$ we get

$$I = \frac{Q}{\sqrt{LC}} = \frac{3.0 \times 10^{-9} \text{ C}}{\sqrt{(3.0 \times 10^{-3} \text{ H})(1.0 \times 10^{-9} \text{ F})}} = 1.7 \times 10^{-3} \text{ A} .$$

(c) When the current is at a maximum, the magnetic field is at maximum:

$$U_{B,\text{max}} = \frac{1}{2}LI^2 = \frac{1}{2}(3.0 \times 10^{-3} \text{ H})(1.7 \times 10^{-3} \text{ A})^2 = 4.5 \times 10^{-9} \text{ J} .$$