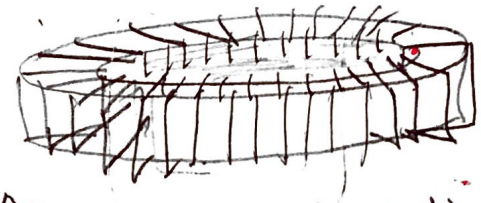
4.47



Rectangular toroid
(Rectangle is cross-section)

$h = 0.10\,m$

$N = 2000$ windings
$L = 0.040\,H$

$U = 2.0e\text{-}6\,J$
$I = ?$

$$U = \frac{1}{2}LI^2$$

$$I = \sqrt{\frac{2U}{L}}$$

$$= \sqrt{\frac{2(2.0e\text{-}6\,J)}{0.040\,H}}$$

$$= \boxed{0.010\,A}$$

14.50 Coil has $L = 3.0\,H$, $R = 100\,\Omega$, & $I = 2.0\,A$

a) Find energy U in coil.

$$U = \frac{1}{2} L I^2$$
$$= \frac{1}{2}(3.0\,H)(2.0\,A)^2$$
$$= \boxed{6.0\,J}$$

b) Find energy/second dissipated by the resistance in the coil.

$$P = I^2 R$$
$$= (2.0\,A)^2(100)$$
$$P = 400\,W = \boxed{400\,\frac{J}{s}}$$