Chapter 7, Solution 13.

(a) $\tau = \frac{1}{10^3} = 1ms$

= **1 ms**.

$v(t) = i(t)R = 80e^{-1000t}$ V = $R5e^{-1000t}x10^{-3}$ or R = 80,000/5 = **16 kΩ**.

But $\tau = L/R = 1/10^3$ or $L = 16x10^3/10^3$ = **16 H**.

(b) The energy dissipated in the resistor is

$$w = \int_0^{0.0005} p\,dt = \int_0^{0.0005} 0.4\,e^{-2000t}\,dt = \frac{-0.4}{2000}\,e^{-2000t}\Big|_0^{0.0005}$$

$$= 200(1-e^{-1})x10^{-6} = \textbf{126.42 µJ}.$$

(a) **16 kΩ, 16 H, 1 ms** **(b) 126.42 µJ**