(250)

$X_L = X_C$

$\omega L = \frac{1}{\omega C} \Rightarrow \omega = \frac{1}{\sqrt{LC}} = 2\pi f_o$

$f_o = \frac{1}{2\pi} \cdot \frac{1}{\sqrt{LC}} = \frac{1}{2\pi} \sqrt{\frac{1}{10 \times 10 \times 10^{-8}}}$

$= 159\,Hz$

$X_L = \omega L = 2 \cdot \pi \cdot 100 \cdot 1 \times 10^{-5}$

$= 6.3 \times 10^{-3}\,\Omega$

$X_C = \frac{1}{\omega C} = 159\,\Omega$

$Z = \sqrt{R^2 + (X_L - X_C)^2} = 187.8\,\Omega$

$$\frac{\mathcal{E}_P}{\mathcal{E}_S} = \frac{N_P}{N_S} \Rightarrow \frac{\mathcal{E}_P}{\mathcal{E}_S} = \frac{100}{50} = 2$$

$$\mathcal{E}_S = \frac{\mathcal{E}_P}{2} = 5V_{AC,RMS}$$

$$\mathcal{E}_S = 0V$$

$\oint \vec{B} \cdot d\vec{s} = \mu_0 I_C$

$n = \frac{N}{h}$

$BW = \mu_0 I (n \cdot w)$

$\mu_0 = 4\pi \times 10^{-7}$

$B = \mu_0 n I$

$n = 1000\ /m$

$B = 0.025T$

$I = 20\ A$

N

$A = .01\ m^2 \Rightarrow \Phi_M = 1\ Tm^2$

$\Phi_{M,1} = B \cdot A \Rightarrow \Phi_M = NBA$

$\Phi_m = (n \cdot A) BA$

$= nB(AR)$

$= \mu_0 n^2 I (AR)$

$u_E = \frac{B^2}{2\mu_0}$ $\quad U = u_E (AR)$

$= \frac{B^2}{2\mu_0}(AR)$

$L = \frac{\Phi_M}{I} = \mu_0 n^2 (AR)$

$I = 1A$

$\Phi_M = .1\ TM^2 (10) = 1\ TM^2$

$L = .1\ H$ $\quad U = \frac{1}{2} L I^2$

$= \frac{1}{2}(.1)(2)^2 J$

$\oint \vec{B} \cdot d\vec{s} = \mu_0 I_C$

$B(2\pi w) = \mu_0 I_1$

$\vec{B} = \frac{\mu_0 I_1}{2\pi w}$ ⊗

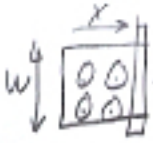
$\vec{F} = I_2 \vec{L}_2 \times \vec{B}$

$F = \frac{\mu_0 I_1 I_2 L_2}{2\pi w}$

$+\hat{x}$

$B = \frac{4\pi \times 10^{-7} \times 5}{2 \cdot \pi \cdot 1} = 6 \times 10^{-7} T$

$F = 9 \times 6 \times^{-7} N = 36 \times 10^{-7} N$



$x = x_0 + pt^5$

(A)

$$\phi_M = BWx = BW(x_0 + pt^5)$$

$$\varepsilon = -\frac{d\phi_M}{dt} = -5BWpt^4$$

@ $t = 2s$

$$\phi_M = 1 \cdot 1 \cdot (100 + 2 \cdot 2^5)\ Tm^2$$

$$\varepsilon = 5 \cdot 1 \cdot 1 \cdot 2 \cdot 2^4\ V$$