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전기전자공학개론 숙제 #4 정답지

1. (6.28)

$$Q = \frac{\omega_0 L}{R} \therefore L = \frac{RQ}{\omega_0} = \frac{32 \cdot 30}{5{,}000} = 19.2\,mH$$

$$C = \frac{1}{\omega_0^2 L} = \frac{1}{(5{,}000)^2 \cdot 1.92 \times 10^{-3}} = 2.083\,\mu F$$

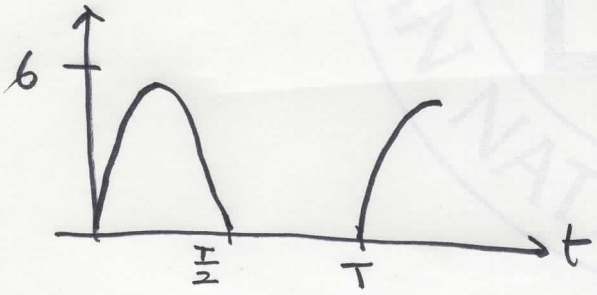
2. (9.9) D_1 & D_2 are forward bias, so they appear as shorts

a) $I_{D_1} = I_{R_1} = \frac{20}{10k} = 2\,mA$

b) $I_{D_2} = I_{R_2} = \frac{20}{20k} = 1\,mA$

c) $I_V = I_{R_1} + I_{R_2} = 3\,mA$

3. (9.11) ideal diode



4. (10.4) Non-inverting Amp.

$$V_o = V_i\left(1 + \frac{R_2}{R_1}\right)$$

$$A_v = 1 + \frac{R_2}{R_1} = 41$$

$$\therefore \frac{R_2}{2K\Omega} = 40$$

$$\therefore R_2 = 80K\Omega$$

5. (10.28) Integrater

$$V_o(t) = \frac{1}{RC}\int_0^t V_i(t)\,dt$$

$$= \begin{cases} \frac{1}{2k \cdot 5\mu} 2\int_0^t dt, & 0<t<1 \\ 10.2\int_0^1 dt + 10.4\int_0^{t-1} dt, & 1<t<3 \end{cases}$$

(20)

$$= \begin{cases} -20t, & 0<t<1 \\ -20 + 40(t-1), & 1<t<3 \end{cases}$$