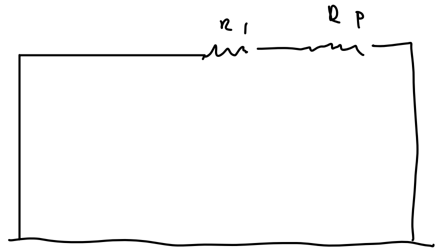
⑪

$$R_p = 1/\left(1/R_2 + 1/R_3\right) = 1/\left(1/40 + 1/120\right) = 30\,\Omega$$



$$V - IR_1 - IR_p = 0$$

$$V_1 = 0.2 \cdot 20\Omega = 4\,V$$

$$10 = I(R_1 + R_p) = I\,50\Omega$$

$$I = 0.2A$$

R_p getting $6\,V$ $\quad V_2 = V_3 = 6\,V$

2

$$V_I - 1.2\,A \cdot 500\,\Omega - I_2 \cdot 50\,\Omega = 0$$

$$V_I - 1.2\,A \cdot 500\,\Omega - I_3 \cdot 100\,\Omega = 0$$

$$I_2 + I_3 = 1.2\,A$$

$$\Rightarrow \quad V_I = 640\,V, \quad I_2 = 0.8\,A, \quad I_3 = 0.4\,A$$

3

a)

C_1 and L_1 are in parallel, R are in series

$$Z = R_1 + \frac{1}{\frac{1}{i\omega C} + \frac{1}{i\omega L}}$$

b)

by similarly token, C_2 are in series, R_2 and L_2 are in parallel

$$Z = \frac{1}{i\omega C} + \frac{1}{\frac{1}{R_2} + \frac{1}{i\omega L}}$$

4

$$V_C = \frac{Z_C}{Z_C + Z_R} V_{in}$$

$$= -\frac{i/\omega C}{R - i/\omega C} V_{in}$$

$$= \frac{1}{i\omega\tau + 1} V_{in}$$

$$\tau = R \cdot C = 10000\,\Omega \cdot 0.01 \times 10^{-6}\,F$$

$$= 10^{-4}\,s$$

$$\left|\frac{V_C}{V_{in}}\right| = \frac{1}{\sqrt{1+(\omega\tau)^2}} = \frac{1}{\sqrt{2}}$$

$$= \frac{1}{\sqrt{1+\omega^2(10^{-4}s)^2}} = \frac{1}{\sqrt{2}}$$

$$\omega = 10000\,s^{-1}$$

no pass because power drop by $\frac{1}{2}$