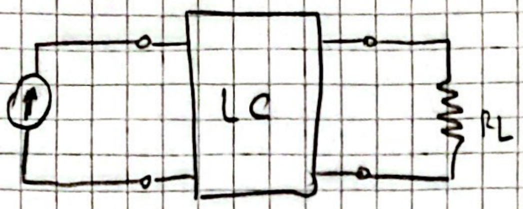
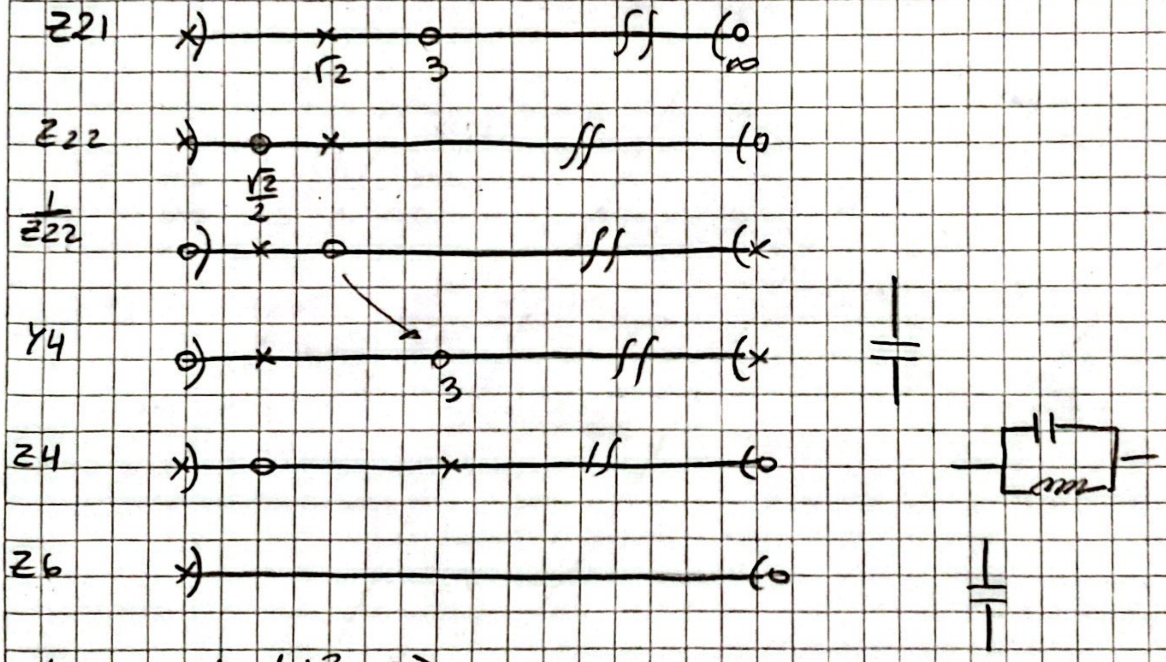
2)



$$T(s) = \frac{V_2}{I_1} = \frac{k\cdot(s^2+9)}{s^3+2s^2+2s+1} = \frac{z_{21}}{1+\frac{z_{22}}{R_L}} \quad R_L \to 1$$

$$z_{21} = \frac{s^2+9}{s^3+2s} \quad \wedge \quad z_{22} = \frac{2s^2+1}{s^3+2s}$$



$$\frac{1}{z_{22}} = \frac{s\,(s^2+2)}{2s^2+1}$$

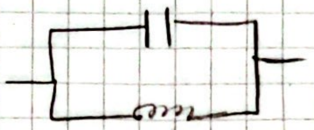
$$Y_4 = \frac{s\,(s^2+2)}{2s^2+1} - k_{c1}\cdot s \qquad k_{c1} = \frac{1}{\cancel{s}}\,\frac{\cancel{s}\,(s^2+2)}{2s^2+1}\Bigg|_{j3}$$

$$\boxed{k_{c1} = \frac{7}{17}}$$

$$Y_4 = \frac{s\,(s^2+2)}{2s^2+1} - \frac{7}{17}\,s$$

$$Y_4 = \frac{s^3+2s - \frac{14}{17}s^3 - \frac{7}{17}s}{2s^2+1} = \frac{\frac{3}{17}s^3 + \frac{27}{17}s}{2s^2+1} = \frac{3}{17}\cdot\frac{s\,(s^2+9)}{2s^2+1}$$

$$2k_1 = \lim_{s^2 \to -9} \frac{\cancel{s^2+9}}{s} \cdot \frac{17}{3} \, \frac{\overbrace{2s^2+1}^{z_4}}{s\,\cancel{(s^2+9)}} = \frac{289}{27}$$



$$\boxed{C_2 = \frac{27}{289}}$$

$$\boxed{L_2 = \frac{289}{243}}$$

$$Z_6 = \frac{17}{3}\,\frac{2s^2+1}{s(s^2+9)} - \frac{\frac{289}{27}\,s}{s^2+9}$$

$$Z_6 = \frac{\frac{34}{3}s^2 + \frac{17}{3} - \frac{289}{27}s}{s(s^2+9)} = \frac{17/27\,s^2 + \frac{17}{3}}{s(s^2+9}$$

$$Z_6 = \frac{17}{27}\,\frac{\cancel{s^2+9}}{s\,\cancel{(s^2+9)}} \qquad \frac{17}{27}\cdot\frac{1}{s} \qquad \boxed{C_3 = \frac{27}{17}}$$

$$k = \frac{1}{9}$$