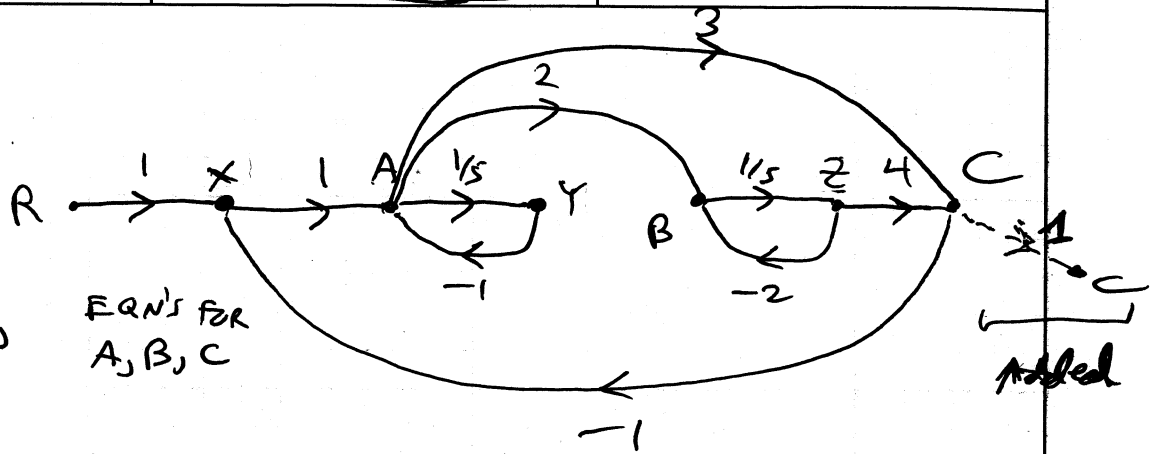


2.14.)



FIND:  $\frac{C}{R}$ , EQN'S FOR A, B, C

FORWARD PATHS

$$\left. \begin{aligned} M_1 &= 1 \cdot 1 \cdot 3 = 3 \quad (R \times A \times C) \\ M_2 &= 1 \cdot 1 \cdot 2 \cdot \frac{1}{5} \cdot 4 = \frac{8}{5} \quad (R \times A \times B \times Z \times C) \end{aligned} \right\} P=2$$

LOOPS

$$\left. \begin{aligned} L_1 &= \frac{1}{5}(-1) = -\frac{1}{5} \quad (AY) \\ L_2 &= \frac{1}{5}(-2) = -\frac{2}{5} \quad (BZ) \\ L_3 &= 1 \cdot 2 \cdot \frac{1}{5} \cdot 4(-1) = -\frac{8}{5} \quad (XABZC) \\ L_4 &= 1 \cdot 3 \cdot (-1) = -3 \quad (XAC) \end{aligned} \right\} L=4$$

NON TOUCHING LOOPS:  $L_1 + L_2$ ,  $L_2 + L_4$

$$\begin{aligned} \Delta &= 1 - (L_1 + L_2 + L_3 + L_4) + (L_1 L_2 + L_2 L_4) \\ &= 1 - \left(-\frac{1}{5} - 3\right) + \left(\frac{2}{5^2} + \frac{6}{5}\right) = 4 + \frac{17}{5} + \frac{2}{5^2} \end{aligned}$$

$\Delta_1$  (RXAC REMOVED)



$$\begin{aligned} L_1 &= -\frac{2}{5} \quad L=1 \\ \Delta_1 &= 1 - L_1 = 1 + \frac{2}{5} \end{aligned}$$

$\Delta_2$  (R X A B Z C, REMOVED)

$\rightarrow y \quad z=0 \Rightarrow \Delta_2 = 1$

$$T = \frac{C}{R} = \frac{m_1 \Delta_1 + m_2 \Delta_2}{\Delta} = \frac{3(1 + \frac{2}{s}) + \frac{6}{s}}{4 + \frac{17}{s} + \frac{2}{s^2}}$$
$$= \boxed{\frac{3s^2 + 14s}{4s^2 + 17s + 2}}$$

EQUATIONS FOR A, B, C :

$$A = 1 \cdot X + (-1) \cdot Y = 1(R - C) - A(\frac{1}{s})$$
$$\Rightarrow \boxed{A = \frac{R - C}{1 + \frac{1}{s}}} \quad C = T \cdot R$$

$$B = 2A - 2z = 2A - 2(\frac{1}{s}B)$$
$$\Rightarrow \boxed{B = \frac{2A}{(1 + \frac{2}{s})}}$$

$$C = 3A + 4z = 3A + 4(\frac{1}{s}B)$$
$$\Rightarrow \boxed{C = 3A + \frac{4}{s}B}$$