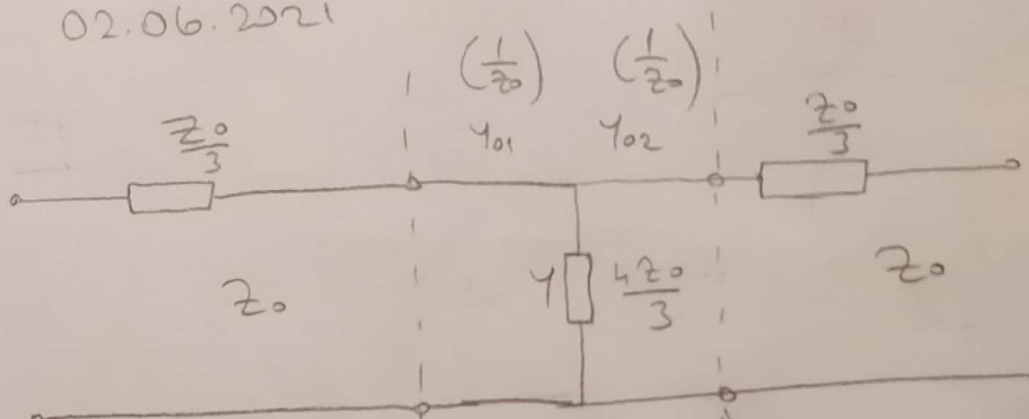
EHB 362
Kısa Sınav 2
02.06.2021

Ahmet Hamdi Celik
040180081

$Y_0 = \frac{1}{Z_0}$

$Y = \frac{4Z_0}{3}$

$Y = \frac{3}{4} Y_0$



en solda bulduğum gibi iki kaskat yapı daha ayırıp

$$S = \begin{bmatrix} 1/7 & 6/7 \\ 6/7 & 1/7 \end{bmatrix}$$

$$S_{11} = \frac{\left(\frac{Z_0}{3} + Z_0\right) - Z_0}{\left(\frac{Z_0}{3} + Z_0\right) + Z_0} = \frac{Z_0/3}{7\,Z_0/3}$$

$$S_{11} = \frac{1}{7}$$

$$S_{22} = \frac{\left(\frac{Z_0}{3} + Z_0\right) - Z_0}{\left(\frac{Z_0}{3} + Z_0\right) + Z_0} = \frac{1}{7}$$

simetriden dolayı;

$$S_{12} = S_{21} = \sqrt{\frac{Z_0}{Z_0}}\left(1 - S_{11}\right) = \frac{6}{7}$$

$$S = \begin{bmatrix} 1/7 & 6/7 \\ 6/7 & 1/7 \end{bmatrix}$$

$$S_{11} = \frac{Y_{01} - (Y + Y_{02})}{Y_{01} + (Y + Y_{02})}$$

$$= \frac{Y_0 - \left(\frac{3}{4}Y_0 + Y_0\right)}{Y_0 + \left(\frac{3}{4}Y_0 + Y_0\right)} = \frac{-3/4\,Y_0}{11/4\,Y_0} = \frac{-3}{11}$$

$$S_{22} = \frac{Y_{02} - (Y + Y_{01})}{Y_{02} + (Y + Y_{01})} = \frac{-3}{11}$$

$$S_{21} = \sqrt{\frac{Y_{02}}{Y_{01}}}\left(1 + S_{11}\right) = \frac{8}{11}$$

$$S_{12} = \sqrt{\frac{Y_{01}}{Y_{02}}}\left(1 + S_{22}\right) = \frac{8}{11}$$

$$S = \begin{bmatrix} -3/11 & 8/11 \\ 8/11 & -3/11 \end{bmatrix}$$

★ Daire içine alınmış kısmın kaskat yapı olarak s-parametrelerini bulugorum.

$$S^B = \begin{bmatrix} -3/11 & 8/11 \\ 8/11 & -3/11 \end{bmatrix} \qquad S^C = \begin{bmatrix} 1/7 & 6/7 \\ 6/7 & 1/7 \end{bmatrix}$$

$$S_{11} = S_{11}^B + \frac{S_{11}^C S_{12}^B S_{21}^B}{1 - S_{11}^C S_{22}^B} = \left(-\frac{3}{11}\right) + \frac{\left(\frac{1}{7}\right)\left(\frac{8}{11}\right)\left(\frac{8}{11}\right)}{1 - \left(\frac{1}{7}\right)\left(-\frac{3}{11}\right)} = -0,2$$

$$S_{22} = S_{22}^C + \frac{S_{12}^C S_{21}^C S_{22}^B}{1 - S_{11}^C S_{22}^B} = \left(\frac{1}{7}\right) + \frac{\left(\frac{6}{7}\right)\left(\frac{6}{7}\right)\left(\frac{-3}{11}\right)}{1 - \left(\frac{1}{7}\right)\left(-\frac{3}{11}\right)} = -0,05$$

$$S_{12} = \frac{S_{12}^B S_{12}^C}{1 - S_{11}^C S_{22}^B} = \frac{\left(\frac{8}{11}\right)\left(\frac{6}{7}\right)}{1 - \left(\frac{1}{7}\right)\left(-\frac{3}{11}\right)} = 0,6$$

$$S_{21} = \frac{S_{21}^B S_{21}^C}{1 - S_{11}^C S_{22}^B} = \frac{\left(\frac{8}{11}\right)\left(\frac{6}{7}\right)}{1 - \left(\frac{1}{7}\right)\left(-\frac{3}{11}\right)} = 0,6$$

$$S = \begin{bmatrix} -0,2 & 0,6 \\ 0,6 & -0,05 \end{bmatrix}$$

★ Baştaki kısmla kaskat yaparak son matrisi bulugorum.

$$S^A = \begin{bmatrix} 1/7 & 6/7 \\ 6/7 & 1/7 \end{bmatrix} \qquad S^K = \begin{bmatrix} -0,2 & 0,6 \\ 0,6 & -0,05 \end{bmatrix}$$

$$s_{11} = \frac{1}{7} + \frac{(-0,2)\left(\frac{6}{7}\right)\left(\frac{6}{7}\right)}{1-(-0,2)\left(\frac{1}{7}\right)} = 0$$

$$s_{22} = (-0,05) + \frac{(0,6)(0,6)\left(\frac{1}{7}\right)}{1-(-0,2)\left(\frac{1}{7}\right)} = 0$$

$$s_{12} = \frac{\left(\frac{6}{7}\right)(0,6)}{1-(-0,02)\left(\frac{1}{7}\right)} = 0,5$$

$$s_{21} = \frac{\left(\frac{6}{7}\right)(0,6)}{1-(-0,02)\left(\frac{1}{7}\right)} = 0,5$$

$$S = \begin{bmatrix} 0 & 0,5 \\ 0,5 & 0 \end{bmatrix}$$