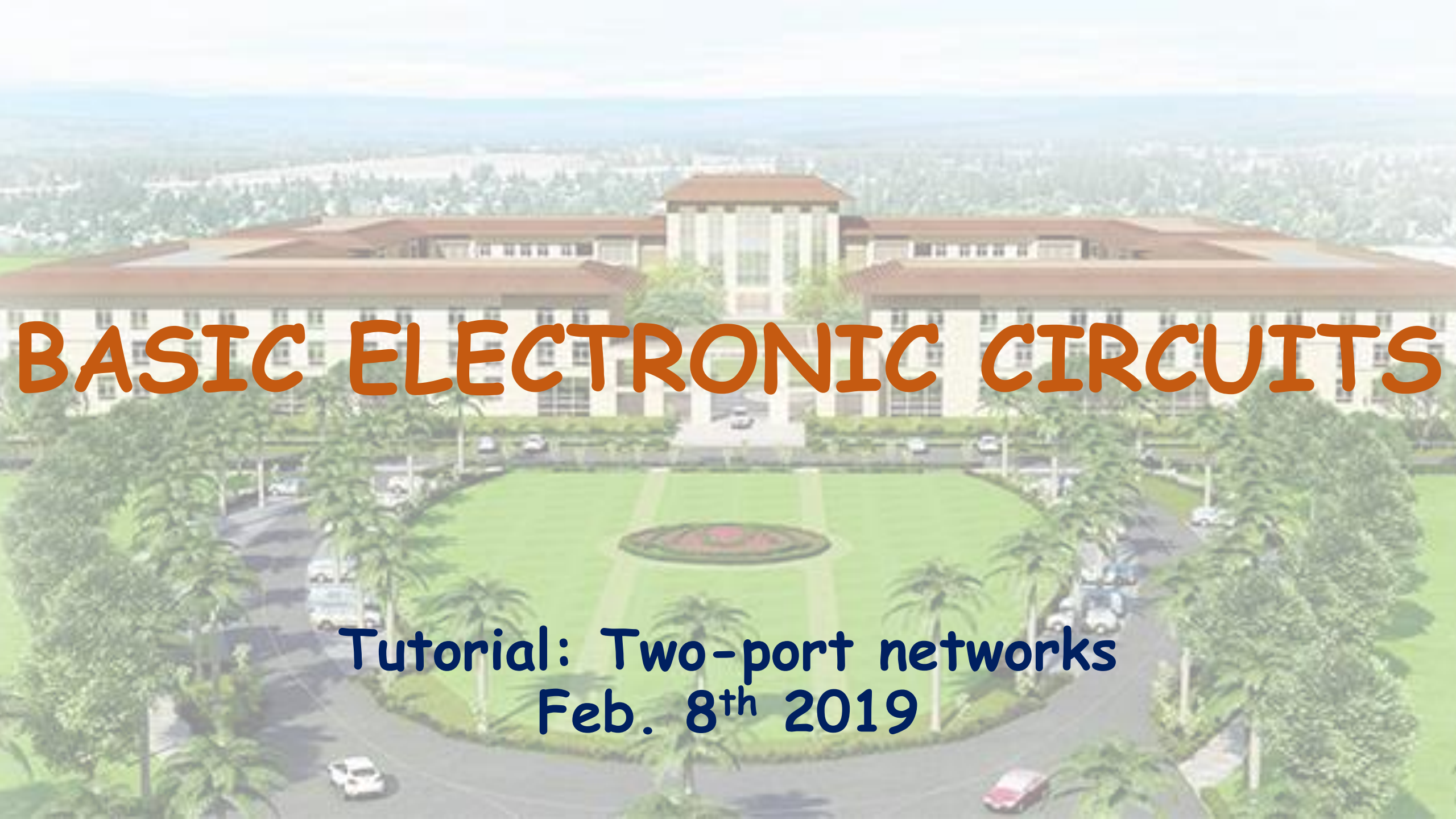
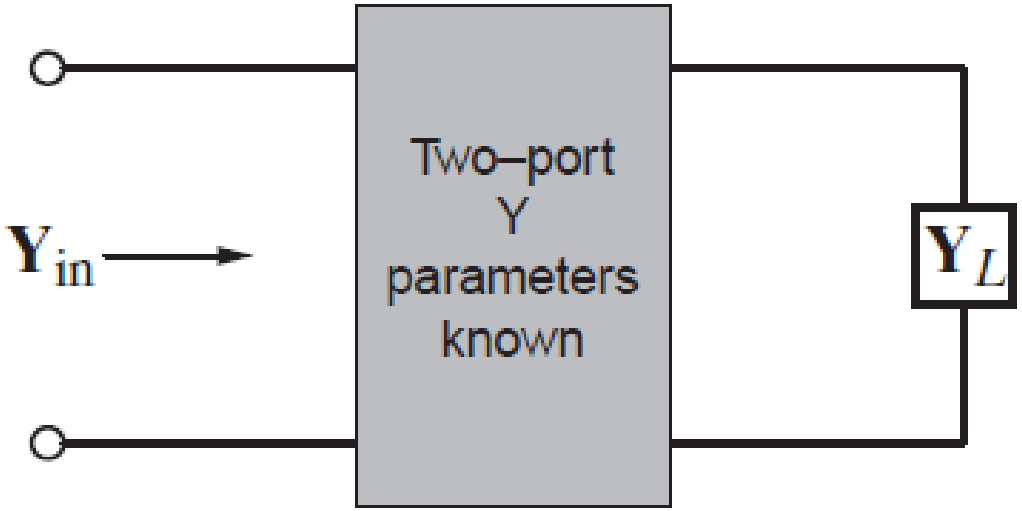


BASIC ELECTRONIC CIRCUITS

Tutorial: Two-port networks

Feb. 8th 2019

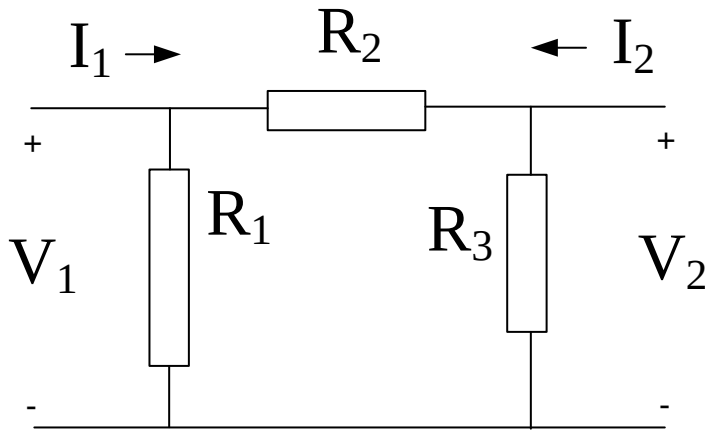
Find the input admittance of a two-port network, in terms of Y parameters and load Y_L.



$$\frac{I_1}{V_1} = \frac{Y_{11}Y_L + Y_{11}Y_{22} - Y_{12}Y_{21}}{Y_L + Y_{22}}$$

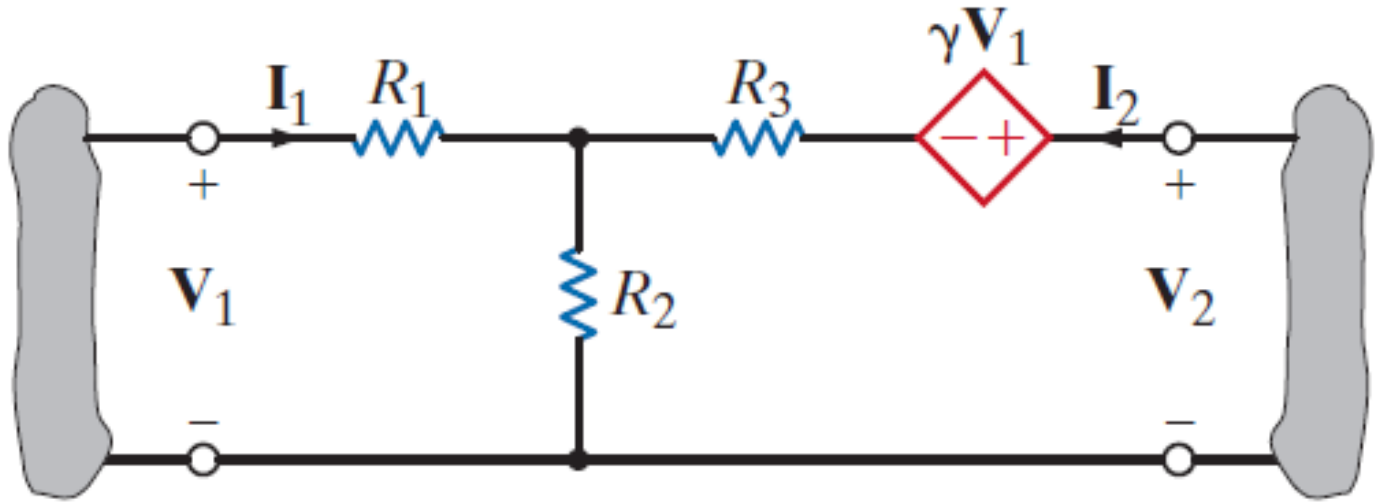
Draw the circuit diagram (with all passive elements in ohms) for the network that has the following Y parameters.

$$[Y] = \begin{bmatrix} \frac{3}{2} & -\frac{1}{2} \\ -\frac{1}{2} & \frac{5}{6} \end{bmatrix}$$



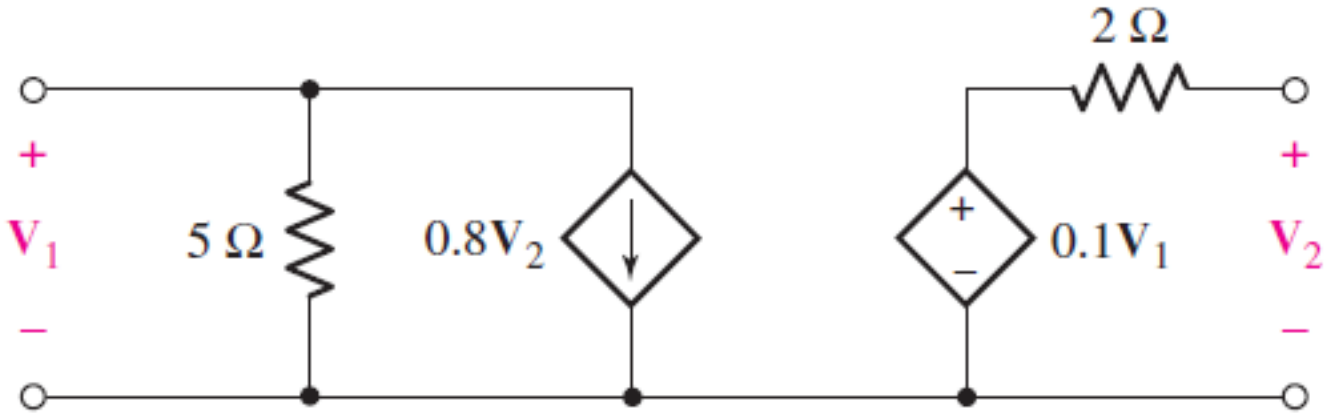
$R_1 = 1\Omega$; $R_2 = 2\Omega$; $R_3 = 3\Omega$.

Find the Z parameters of the following networks.



$$\begin{bmatrix} R_1 + R_2 & R_2 \\ \gamma(R_1 + R_2) + R_2 & R_2(\gamma + 1) + R_3 \end{bmatrix}$$

Obtain the Z parameters of the network shown, and determine I_1 and I_2 for $V_1 = 5$ V and $V_2 = 0$ V.

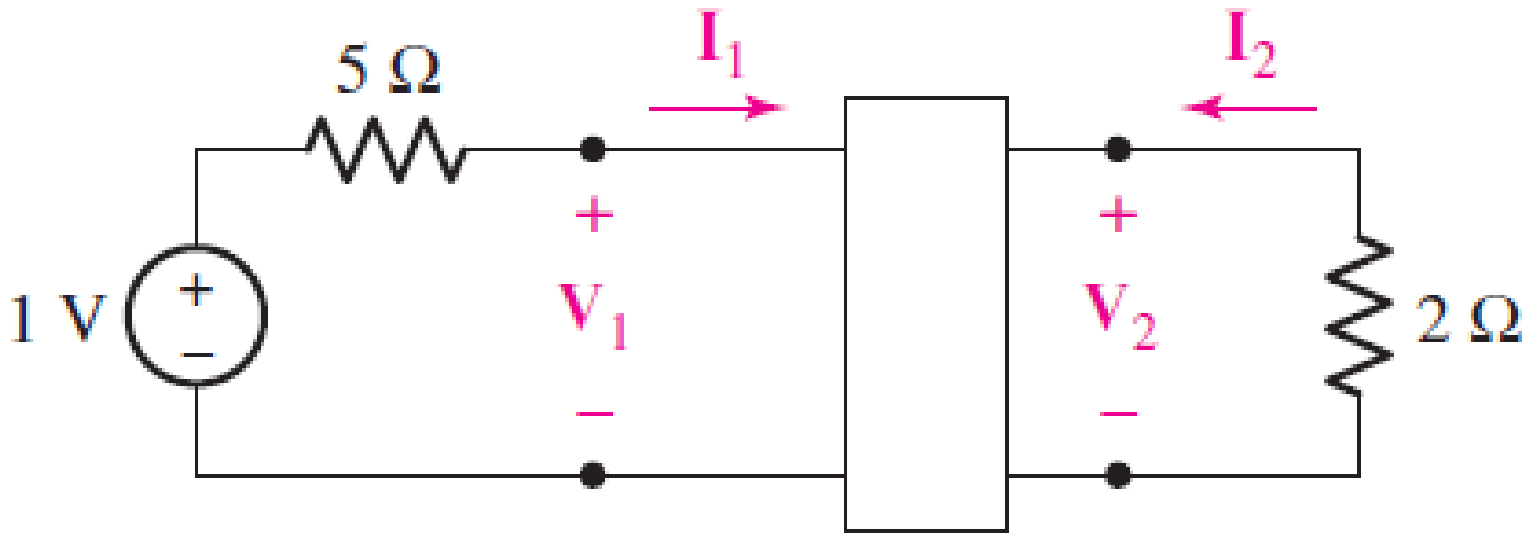


$$\begin{bmatrix} 3.57 & -5.71 \\ 0.357 & 1.43 \end{bmatrix}$$

$I_1 = 1$ A ; $I_2 = -0.25$ A.

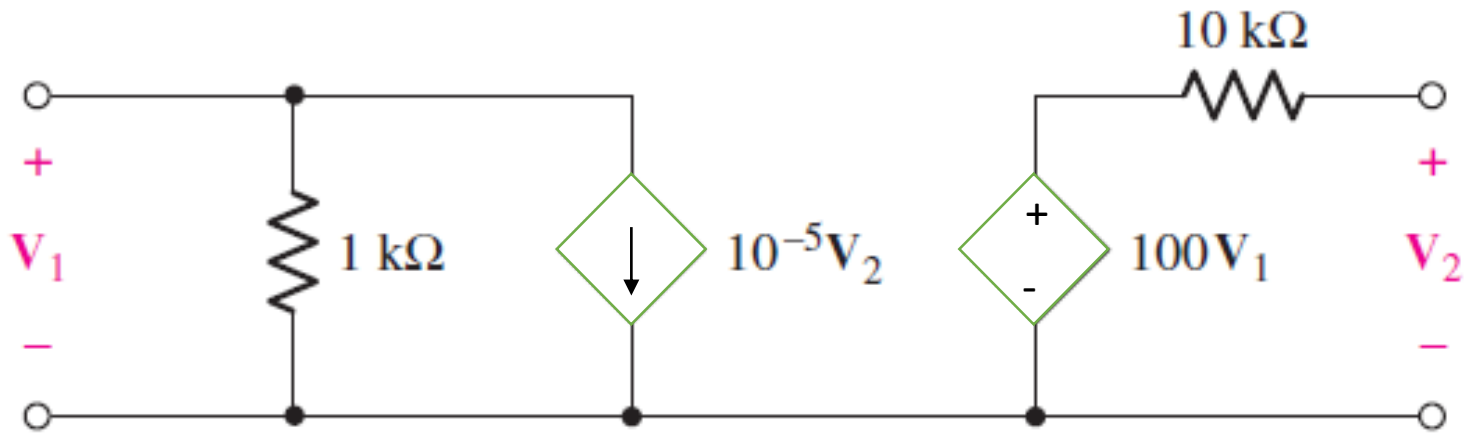
The two-port network has following hybrid parameters, Determine I_1, I_2, V_1 and V_2.

$$h = \begin{bmatrix} 1\ \Omega & -1 \\ 2 & 0.5\ S \end{bmatrix}$$



V_1 = 3/8 v; V_2 = -1/4 v; I_1 = I_2 = 1/8 A.

Obtain the T (ABCD) parameters of the network shown, and determine V_2, I_1 and I_2 when V_1 = 10 V and a load of 10 KΩ is connected across the output terminals.



$$T = \begin{bmatrix} 0.01 & 100 \\ 20\ \mu S & 0.1 \end{bmatrix}$$

V_2 = 500 v; I_1 = 15 mA; I_2 = -0.05 A.