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12 December 2020

BASICS OF ELECTRICAL CIRCUITS

Homework -IV

1. (a) The 3-terminal circuit element in Figure 1 ($v_b = \beta v_2$) is given with the terminal graph shown in Figure 2. For this terminal graph, obtain terminal equations in the following form

$$\begin{bmatrix} v_1 \\ i_2 \end{bmatrix} = \begin{bmatrix} . & . \\ . & . \end{bmatrix} \begin{bmatrix} i_1 \\ v_2 \end{bmatrix}$$

   (b) Using the result in (a), obtain terminal equations for the terminal graph given in Figure 3 in the following form

$$\begin{bmatrix} \hat{v}_1 \\ i_3 \end{bmatrix} = \begin{bmatrix} . & . \\ . & . \end{bmatrix} \begin{bmatrix} i_1 \\ \hat{v}_3 \end{bmatrix}$$

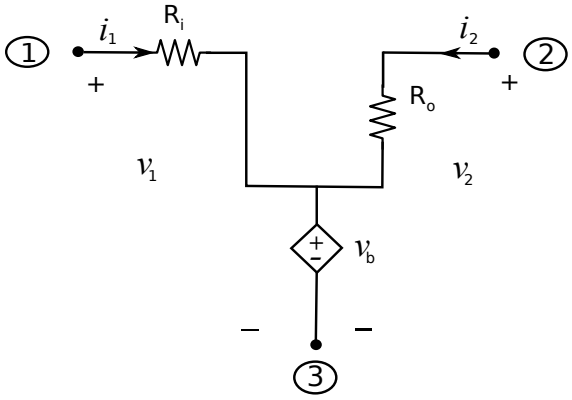

Figure 1

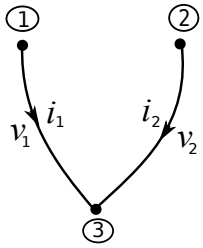

Figure 2

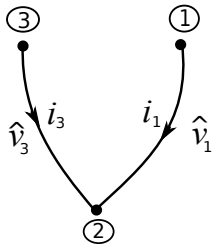

Figure 3