

EE 201 Electric Circuits Quiz 3 Solution (Sample Quiz)

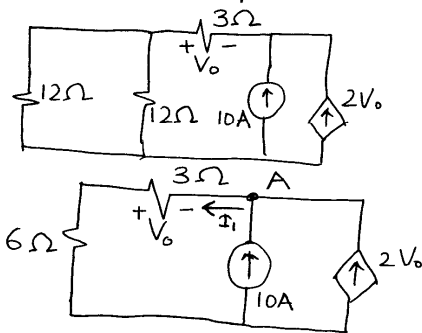
Quiz # 3
EE201-06 (032)

Name KEY
ID# _____

For the following circuit find

- (a) V_o
(b) Power absorbed or delivered by the dependent source.

Soln:- (a)
Combine 6 & 6 in series
and then in parallel with 12Ω .



Apply KCL at node A.

$$10 + 2V_o = I_1 \quad \text{--- (1)}$$

($2V_o$ is the current of VDCS).

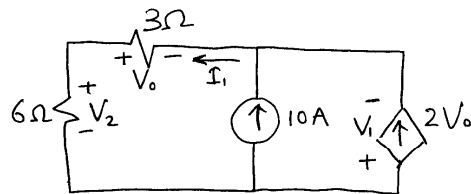
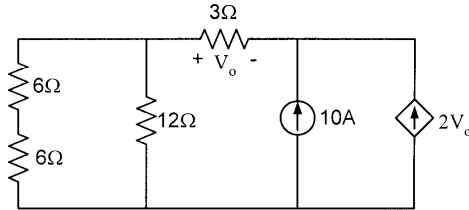
But $I_1 = -\frac{V_o}{3}$ (Ohm's Law)

$$\text{(1)} \Rightarrow 10 + 2V_o = -\frac{V_o}{3}$$

$$\Rightarrow 30 + 6V_o = -V_o$$

$$\Rightarrow V_o = \frac{-30}{7} = -4.28 \text{ Volts.}$$

(b) To find power of the dependent source we need voltage across this source.
Let's suppose the voltage is V_1 with the given polarity.
Apply KVL in the outer loop.



$$-V_2 + V_o - V_1 = 0$$

$$\begin{aligned} \Rightarrow V_1 &= V_o - V_2 \\ &= V_o - (6I_1) \\ &= V_o - (6)\left(-\frac{V_o}{3}\right) \end{aligned}$$

$$\left[I_1 = -\frac{V_o}{3} \text{ from (1)} \right]$$

$$V_1 = V_o + 2V_o = 3V_o$$

$$V_1 = -12.84$$

$$\begin{aligned} P &= +(V_1)(2V_o) \quad [P = +Vi] \\ &= +(-12.84)(2)(-4.28) \\ &= +109.9 \text{ W (absorbed)} \end{aligned}$$