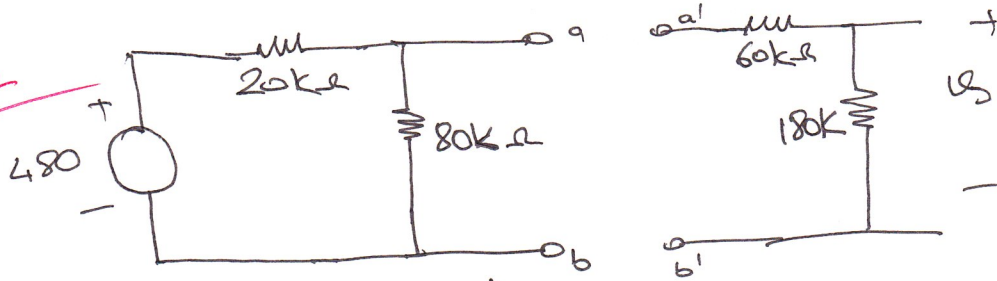
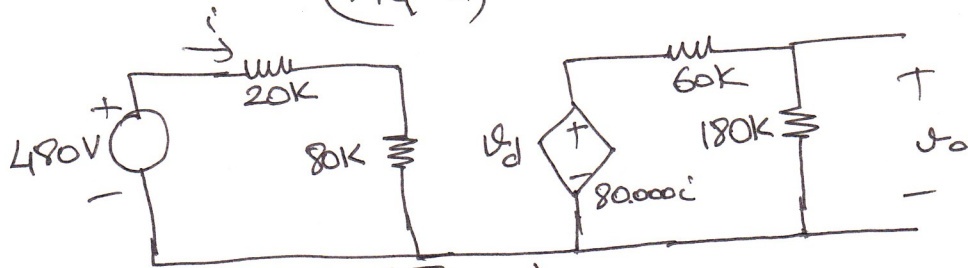


Exc



(Fig a)



(Fig b)

- a) The voltage divider in Fig a is loaded with another voltage divider shown with a' and b' terminals find v_o
- b) Assume that the same configuration is connected by means of a current controlled voltage source as in Fig (b) find v_o
- c) what is the effect of dependent - voltage source?

$$a) R_{a'b'} = 60k\Omega + 180k\Omega = 240k\Omega$$

$$R_{ab} = 80k\Omega \parallel 240k\Omega = 60k\Omega$$

$$V_{ab} = \frac{480}{R_{ab} + 20k\Omega} = 360V$$

$$v_o = \frac{V_{ab}}{240k\Omega} \cdot 180k\Omega = 270V //$$

$$b) i = \frac{480}{20k\Omega + 80k\Omega} = 4.8mA$$

$$v_d = 80,000i = 384V$$

$$v_o = \frac{384V}{240k\Omega} \cdot 180k\Omega = 288V //$$

- c) It removes loading effect of second voltage divider on the first voltage divider.

$$\text{Note that } V_{ab} = \frac{480}{100k\Omega} \cdot 80k\Omega = 384V$$

$$v_d = 384V$$

Therefore there is no loading effect to the first voltage divider. It is an isolation.