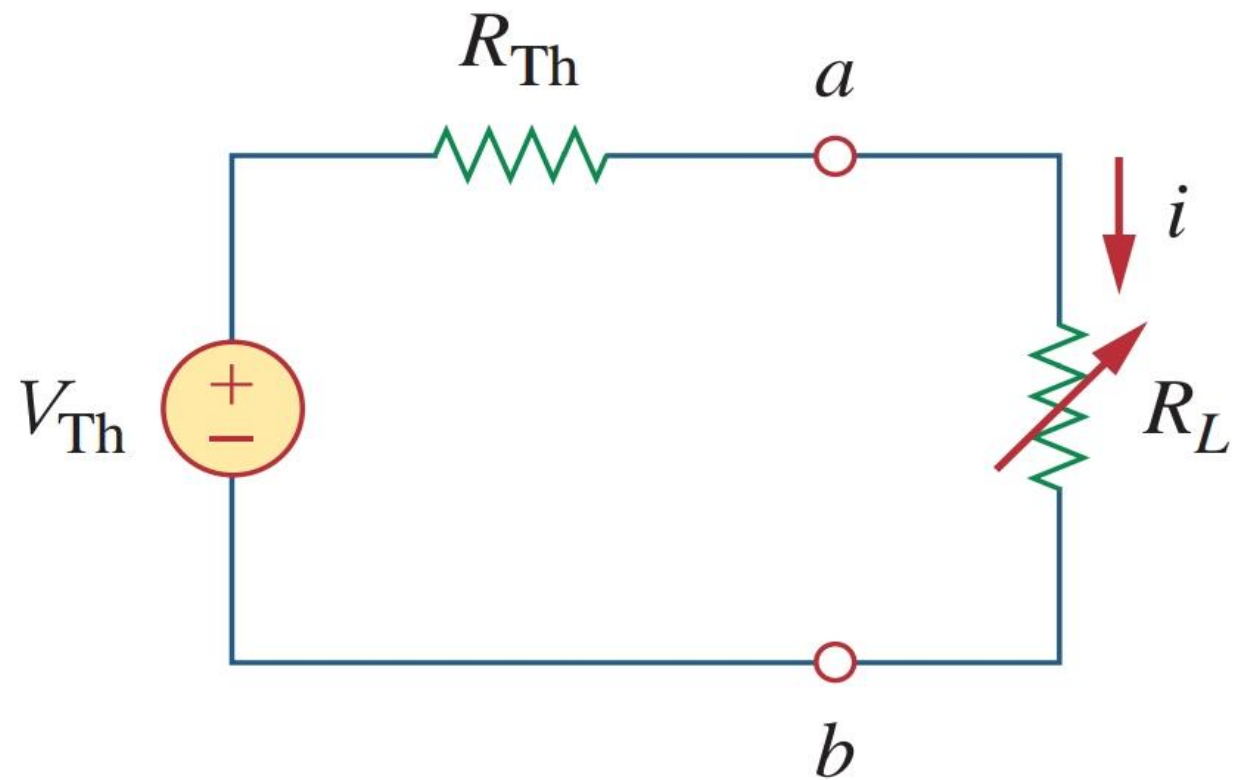


Maximum Power Transfer Theorem

It states that the maximum power can be supplied to a load By adjusting the load And linear circuit is shown as thevenin's equivalent circuit.

The Thevenin equivalent is useful in finding the maximum power a linear circuit can deliver to a load. We assume that we can adjust the load resistance If the entire circuit is replaced by its Thevenin equivalent except for the load.



$$p = i^2 R_L = \left(\frac{V_{Th}}{R_{Th} + R_L} \right)^2 R_L$$

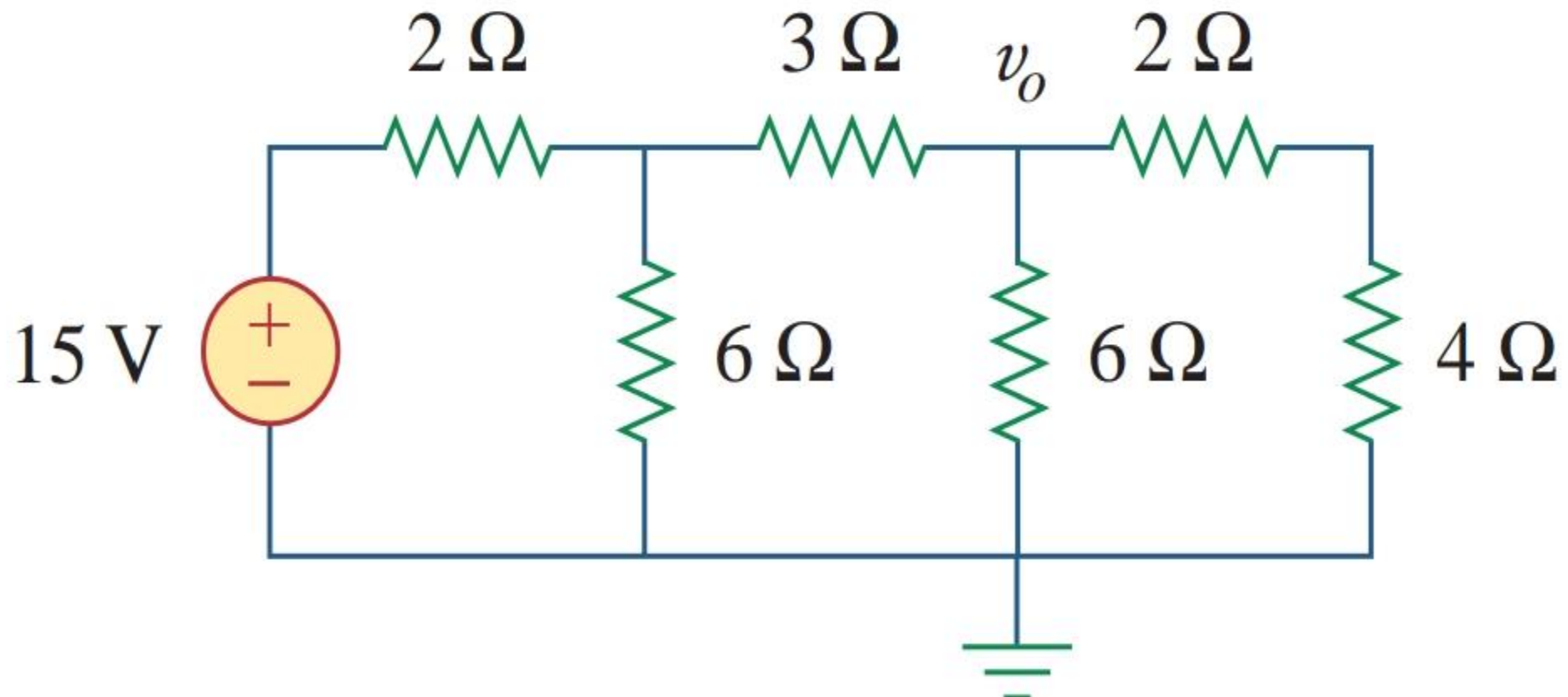
For maximum power transfer , we differentiate with respect to load resistance R_L

$$\begin{aligned}\frac{dp}{dR_L} &= V_{Th}^2 \left[\frac{(R_{Th} + R_L)^2 - 2R_L(R_{Th} + R_L)}{(R_{Th} + R_L)^4} \right] \\ &= V_{Th}^2 \left[\frac{(R_{Th} + R_L - 2R_L)}{(R_{Th} + R_L)^3} \right] = 0\end{aligned}$$

$$0 = (R_{\text{Th}} + R_L - 2R_L) = (R_{\text{Th}} - R_L)$$

$$R_L = R_{\text{Th}}$$

Ques1- find Max. Power Transferred to 6 ohm.



Ques 2

