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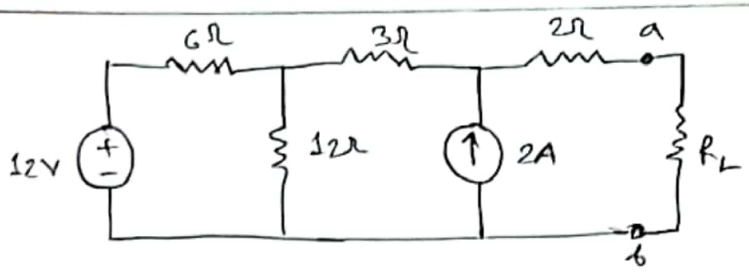
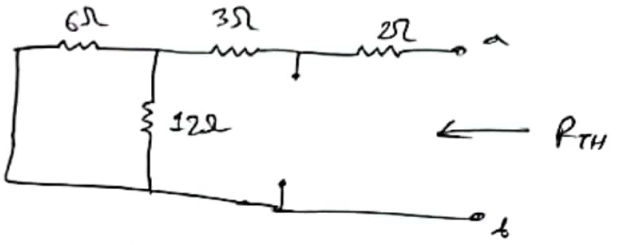


For R_{TH},



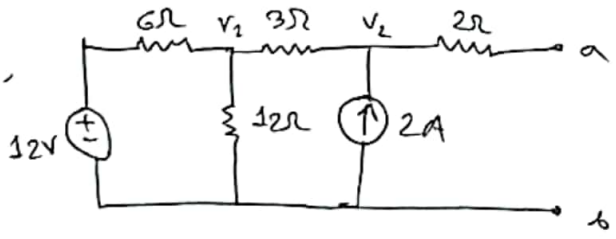
$6\Omega \,||\, 12\Omega = \frac{6 \times 12}{6+12} = 4\Omega$

$\therefore R_{TH} = 4\Omega + 3\Omega + 2\Omega$

$= 9\Omega$

$\therefore$ For maximum power transfer R_L needs to be 9Ω.

For V_{TH},



At KCL At V_1,

$$\frac{V_1 - 12}{6} + \frac{V_1}{12} + \frac{V_1 - V_2}{3} = 0$$

$$\Rightarrow \frac{7V_1}{12} - 2 - \frac{V_2}{3} = 0$$

$$\Rightarrow 7V_1 - 4V_2 = 2 \quad \text{---} \quad (1)$$

KCL at V_2,

$$\frac{V_2 - V_1}{3} - 2 = 0 \Rightarrow V_2 - V_1 = 6$$

$$\therefore V_1 = V_2 - 6 \quad \text{---} \quad (2)$$

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From (1)

$$7(V_2 - 6) - 4V_2 = 2$$

$$\Rightarrow 3V_2 - 42 = 2$$

$$\Rightarrow 3V_2 = 44$$

$$\therefore V_2 = 14.67\ V$$

$$\therefore V_{TH} = V_2 = 14.67\ V$$

$$\therefore P_{max} = \frac{V_{TH}^2}{4R_{TH}} = \frac{14.67^2}{4 \times 3}$$

$$= 5.98\ \text{Watt}.$$