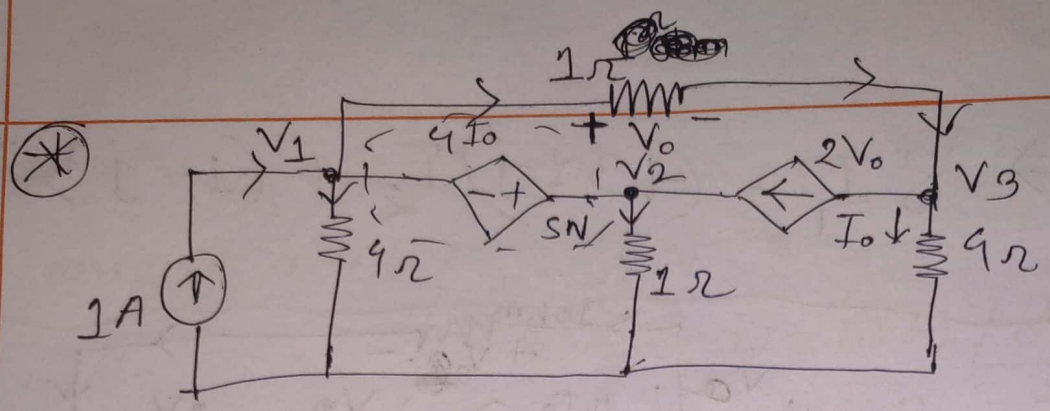


$V_o = V_1 - V_3$;

$I_o = \frac{V_3}{4}$.

Here,

$V_2 - V_1 = 4I_o$

$\Rightarrow V_2 - V_1 = 4 \times \left(\frac{V_3}{4}\right)$

$\Rightarrow V_1 - V_2 + V_3 = 0$ — (1)

Applying KCL at SN,

$$1 + 2V_o = \frac{V_1 - V_3}{1} + \frac{V_1}{4} + \frac{V_2}{1}$$

$$\Rightarrow 1 + 2(V_1 - V_3) = V_1 - V_3 + \frac{V_1}{4} + V_2$$

$$\Rightarrow -\frac{3}{4}V_1 + V_2 + V_3 = 1 \quad \text{— (2)}$$

Applying KCL at node 3,

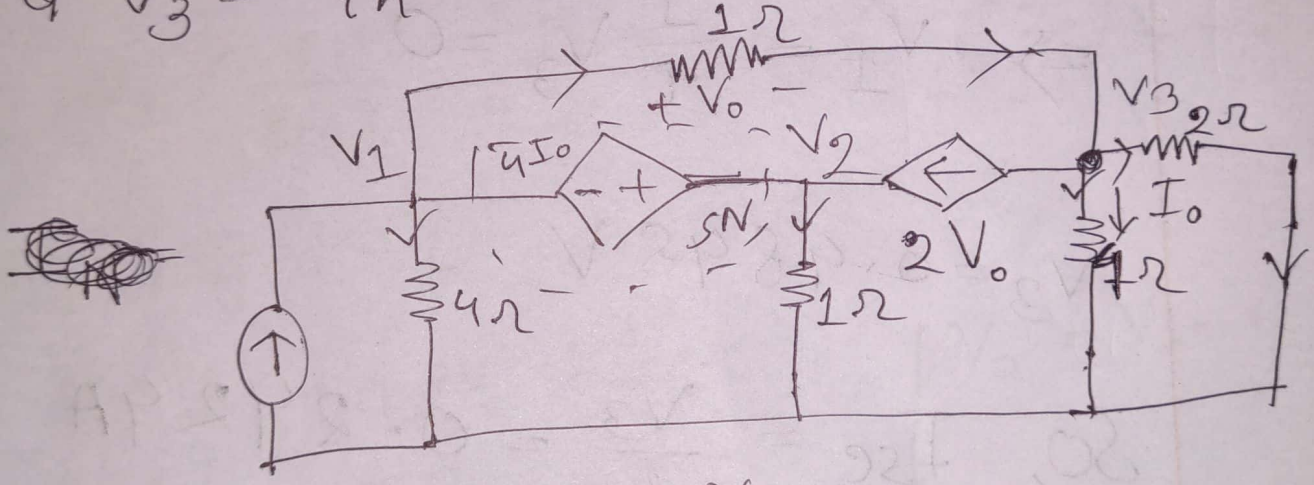
$$\frac{V_1 - V_3}{1} = 2V_o + \frac{V_3}{4}$$

$$\Rightarrow V_1 - V_3 = 2(V_1 - V_3) + \frac{V_3}{4}$$

$$\Rightarrow V_1 - \frac{3}{4}V_3 = 0 \quad \text{—— (3)}$$

solving three equation we get,

$$V_3 = V_{th} = 0.457\ V$$



$$V_o = V_1 - V_3 \quad , \quad I_o = \frac{V_3}{4}$$

Here, $V_2 - V_1 = 4I_o$ —— (i)

$$\Rightarrow V_1 - V_2 + V_3 = 0$$

Applying KCL at SN,

$$1 + 2V_o = \frac{V_1 - V_3}{1} + \frac{V_1}{4} + \frac{V_2}{1}$$

$$\Rightarrow -\frac{3}{4}V_1 + V_2 + V_3 = 1 \quad \text{---(ii)}$$

Applying KCL at node 3,

$$\frac{V_1 - V_3}{1} = 2V_o + \frac{V_3}{4} + \frac{V_3}{2}$$

$$\Rightarrow V_1 - V_3 = 2(V_1 - V_3) + \frac{V_3}{4} + \frac{V_3}{2}$$

$$\Rightarrow V_1 - \frac{1}{4}V_3 = 0$$

$$V_3 = 0.4848\ V$$

$$\text{So, } I_{sc} = \frac{V_3}{2} = 0.2424A$$

$$\therefore R_{th} = \frac{0.457}{0.242} = 1.8852$$

$$P_{max} = \frac{(V_{th})^2}{4 \times R_{th}} = \frac{(0.457)^2}{4 \times 1.886}$$

$$= 0.0277\ W$$