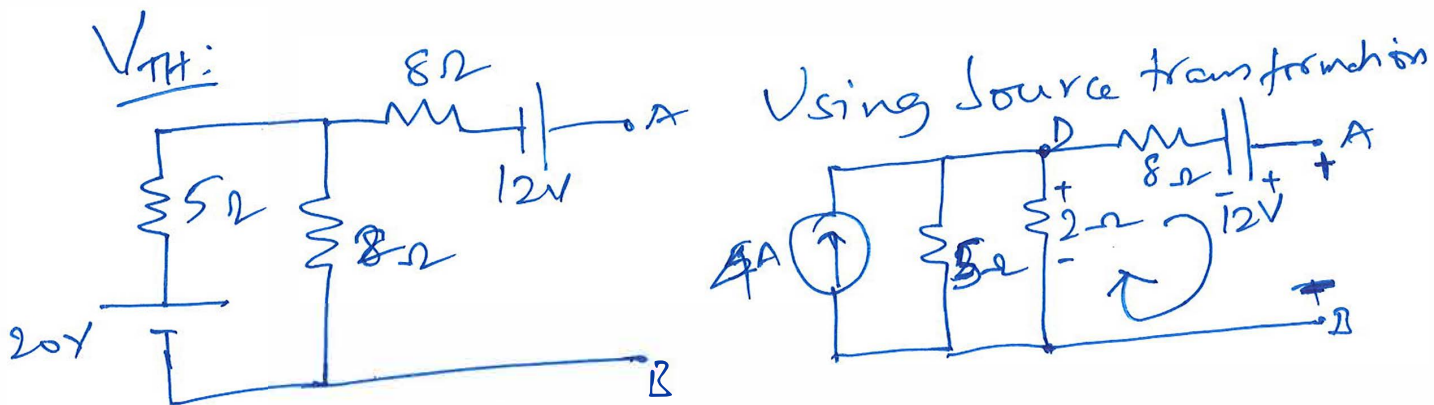
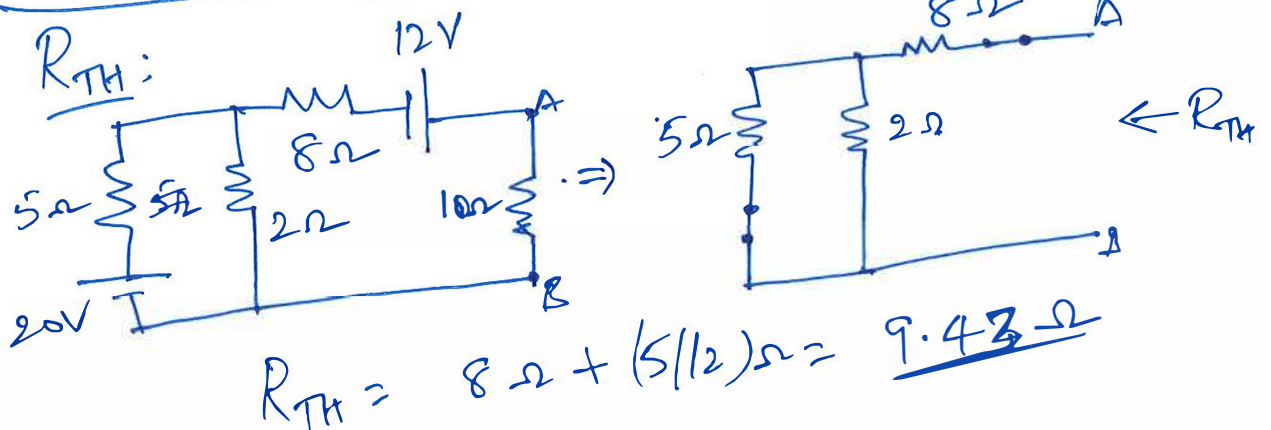


## CSET102 Quiz 3 Solutions

### 1) Thevenin's Equivalent:



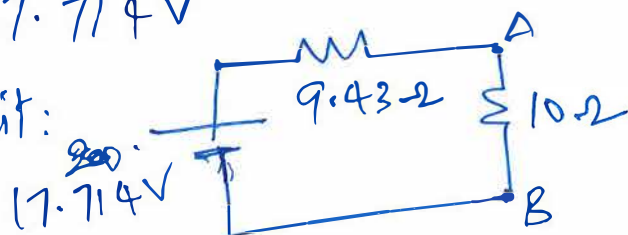
$$I_{2\Omega} = \frac{4 \times 5}{2 + 5} = 2.86A$$

Apply KVL in loop ABDA:  $12 = V_{AB} + 2 \times 2.86 = 0$

$$V_{AB} = +17.714V = V_{TH}$$

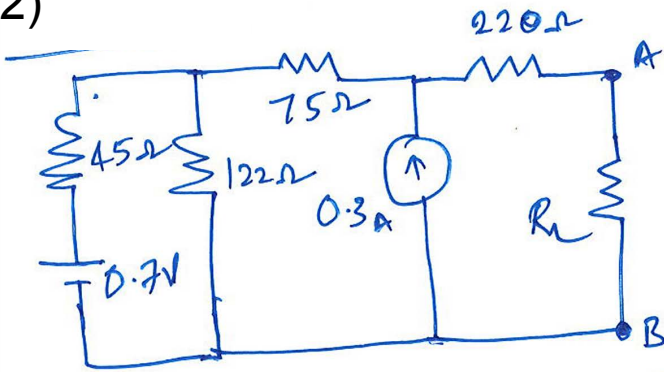
$$V_{TH} = V_{AB} = +17.714V$$

Equivalent circuit:

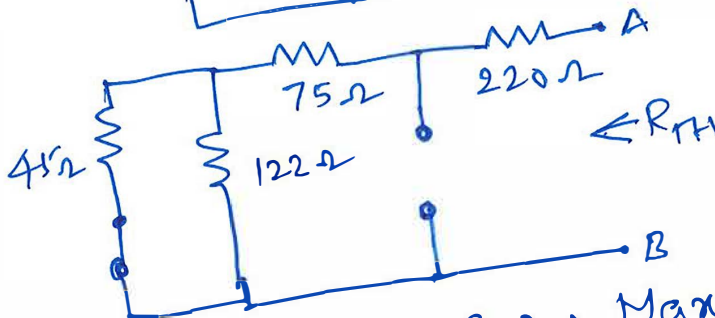
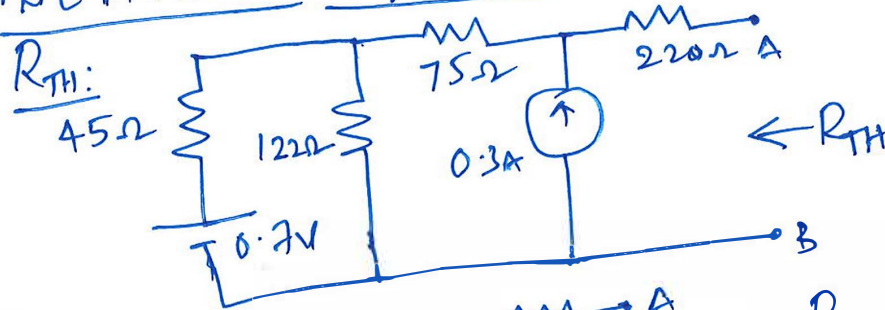


$$V \text{ across } R_L = 17.714 \times 10 / (10 + 9.43) = 9.12V$$

2)

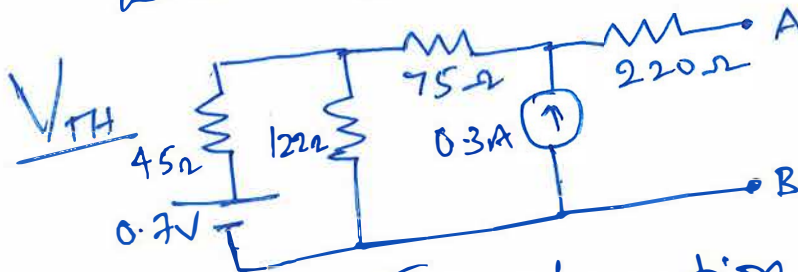


THEVENIN'S EQUIVALENT :

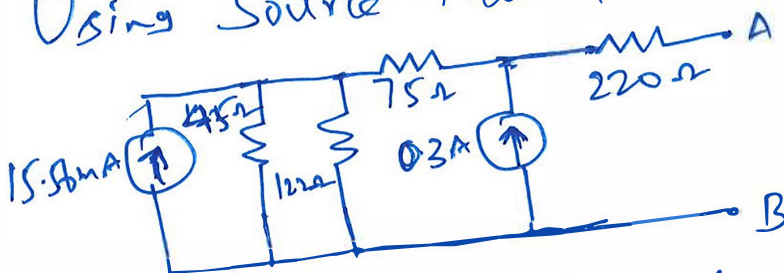


$$R_{AB} = 220 + 75 + (45 \parallel 122) = 323 \Omega$$

$R_{TH} = R_{AB} = 323 \Omega$ . Maximum power is transferred when  $R_L = R_{TH}$ .  $R_L = 323 \Omega$



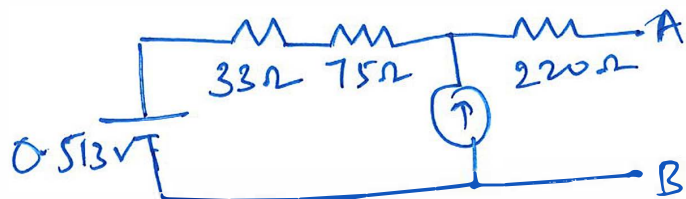
Using Source Transformation  $I_{S1} = \frac{0.7V}{45\Omega} = 15.56mA$



$$45 \parallel 122 = 33 \Omega$$

Using Source transformation,  
 $V_{S1} = 15.56mA \times 33 = \underline{0.513V}$

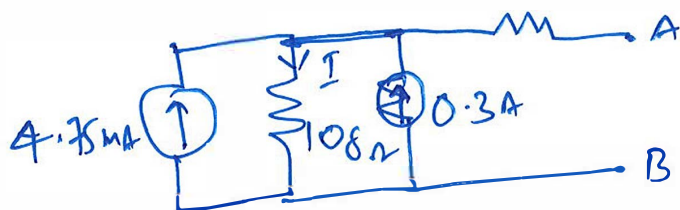
(13)



Using Source transformation,

$$I_s = \frac{0.513}{33 + 75} = 4.75 \text{ mA}$$

$$R_s = 108 \Omega$$

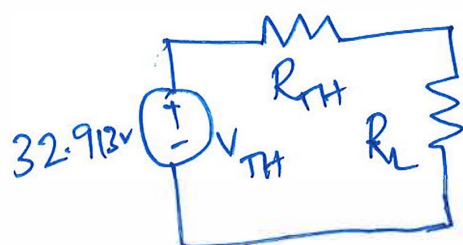


$$I = 0.3 + 4.75 \text{ mA}$$

$$= 304.75 \text{ mA}$$

$$V_{AB} = I \times 108 \Omega = \underline{32.913 \text{ V}}$$

$$V_{TH} = V_{AB} = 32.913 \text{ V}$$



$$R_{TH} = R_L = 323 \Omega$$

$$I_L = \frac{V_{TH}}{R_{TH} + R_L} = 50.95 \text{ mA}$$

$$V_L = I_L \cdot R_L = 16.4565 \text{ V}$$