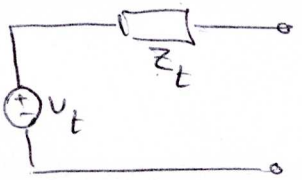
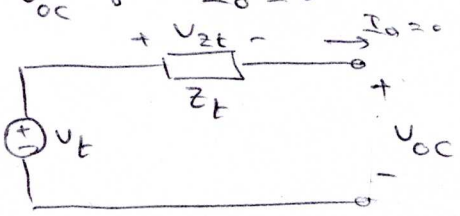
Solutions to Assigned Problems from Appendix C

C.1)



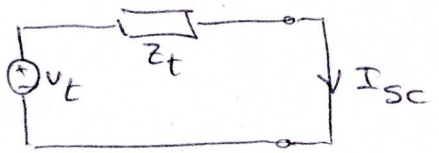
V_{oc} : $I_o = 0$



$V_{oc} = V_t - V_{Zt} = V_t - 0 \times Z_t$

$\Rightarrow \quad V_{oc} = V_t$

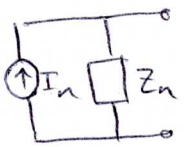
I_{sc} : $V_o = 0$



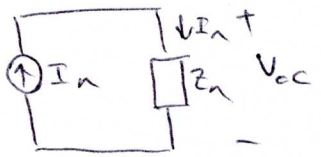
$I_{sc} = \dfrac{V_t}{Z_t}$

$\Rightarrow Z_t = \dfrac{V_{oc}}{I_{sc}}$

C.2)

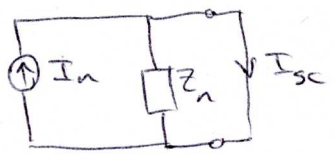


V_{oc} : $I_o = 0$



$V_{oc} = Z_n I_n$

I_{sc} : $V_o = 0$

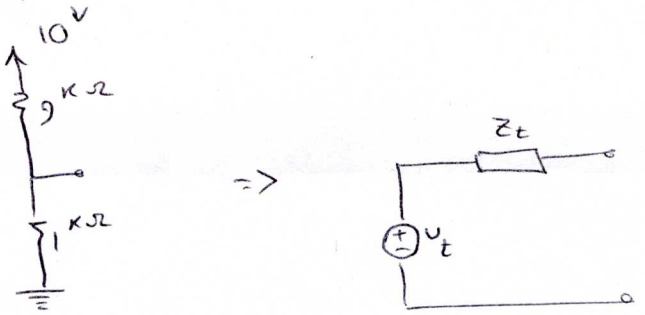


$I_{sc} = \dfrac{Z_n}{Z_n + 0} I_n = I_n$

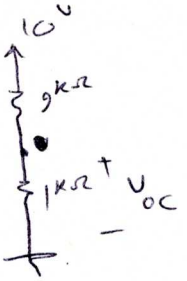
$\Rightarrow Z_n = \dfrac{V_{oc}}{I_{sc}}$

Solutions to Assigned Problems from Appendix C

C.3)

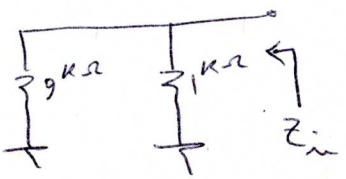


$V_t = V_{oc}$:

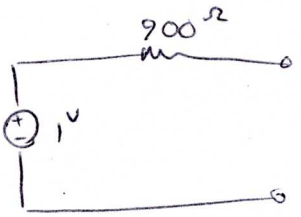


$$V_{oc} = \frac{1\ k\Omega}{1\ k\Omega + 9\ k\Omega} \times 10\ V = 1\ V$$

Z_t : independent sources $\longrightarrow 0$

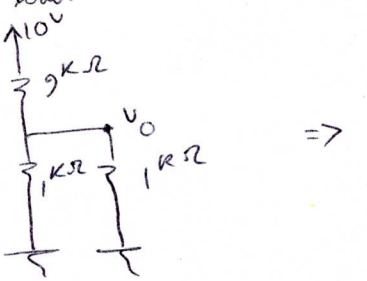


$$Z_{in} = Z_t = 1\ k\Omega \parallel 9\ k\Omega = 0.9\ k\Omega$$



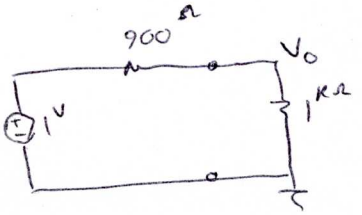
$Z_{load} = 1\ k\Omega$:

(1)



$$V_o = \frac{0.5\ k\Omega}{9\ k\Omega + 0.5\ k\Omega} \times 10\ V = 0.526\ V$$

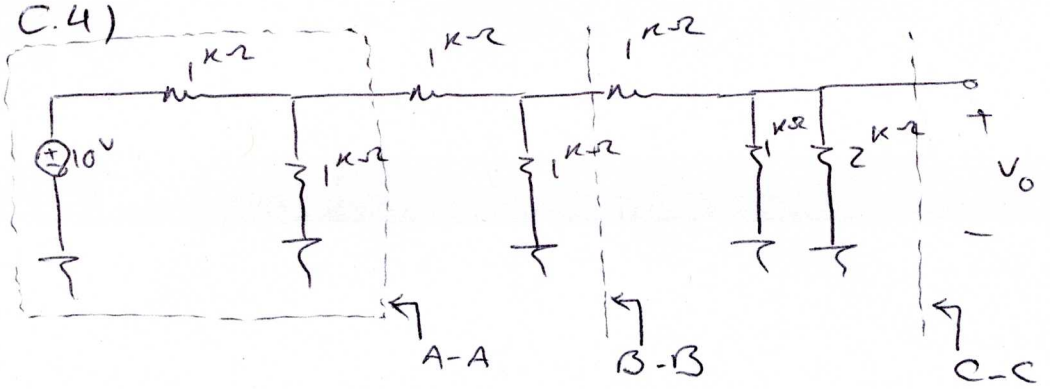
(2)



$$V_o = \frac{1\ k\Omega}{1\ k\Omega + 0.9\ k\Omega} \times 1\ V = 0.526\ V$$

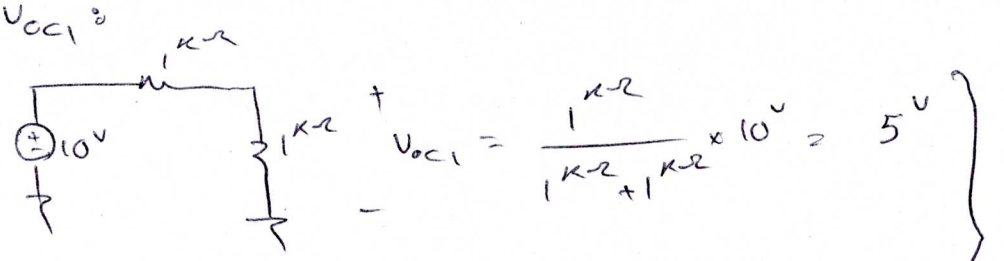
Solutions to Assigned Problems from Appendix C

C.4)



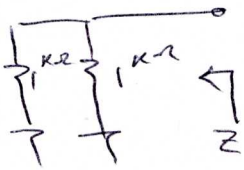
A-A :

1- V_{oc_1} :



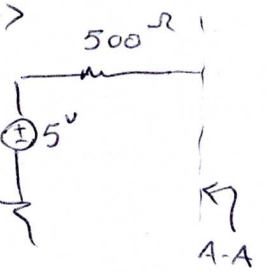
$$V_{oc_1} = \frac{1\ k\Omega}{1\ k\Omega + 1\ k\Omega} \times 10\ V = 5\ V$$

z_{t_1} :

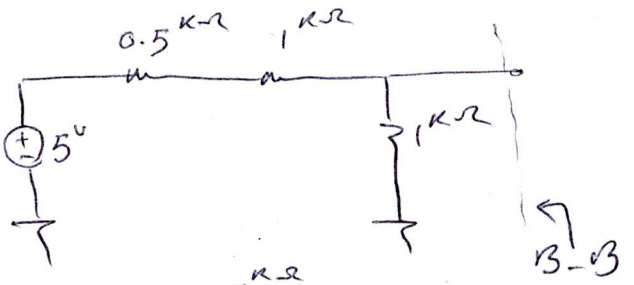


$$z_{t_1} = 1\ k\Omega \,||\, 1\ k\Omega = 0.5\ k\Omega$$

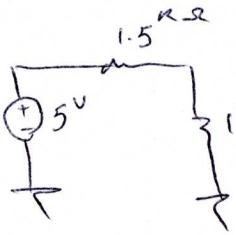
=>



B-B :

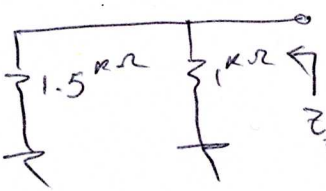


V_{oc_2} :

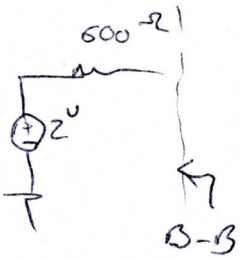


$$V_{oc_2} = \frac{1\ k\Omega}{1\ k\Omega + 1.5\ k\Omega} \times 5\ V = 2\ V$$

z_{t_2} :

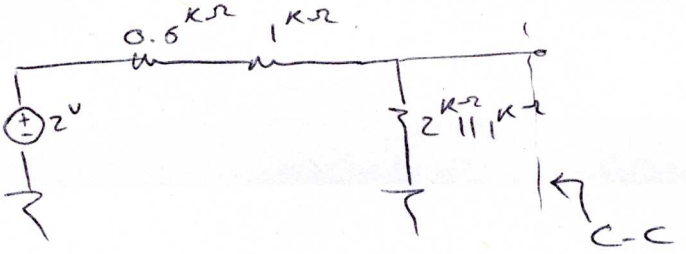


$$z_{t_2} = 1\ k\Omega \,||\, 1.5\ k\Omega = 0.6\ k\Omega$$

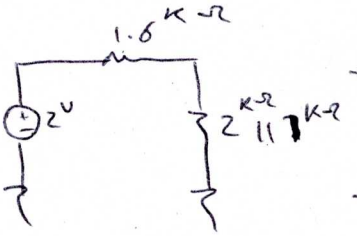


Solutions to Assigned Problems from Appendix C

C-C :

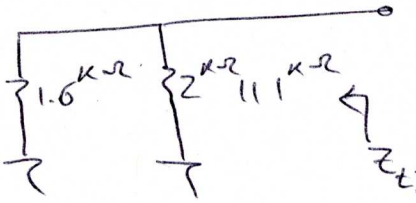


V_{oc3} :



$$V_{oc3} = \frac{2\ \text{k}\Omega \parallel 1\ \text{k}\Omega}{2\ \text{k}\Omega \parallel 1\ \text{k}\Omega + 1.6\ \text{k}\Omega} \times 2\ \text{V} = 0.588\ \text{V}$$

Z_{t3} :



$$Z_{t3} = 2\ \text{k}\Omega \parallel 1\ \text{k}\Omega \parallel 1.6\ \text{k}\Omega = 470.6\ \Omega$$