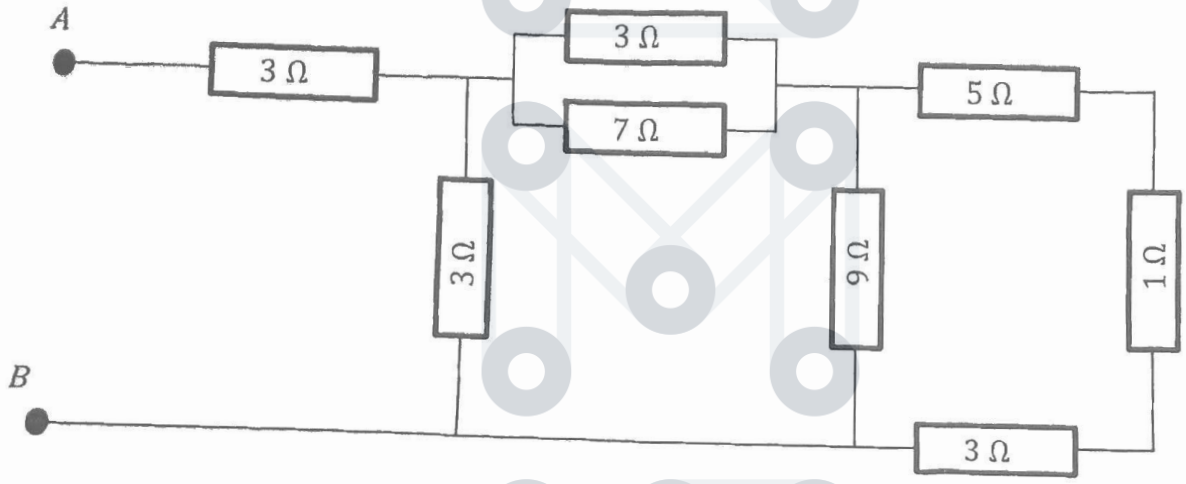
Université Saint-Joseph
Faculté d'ingénierie – ESIB
Département des Classes Préparatoires

Mathématiques supérieures – S1
Lundi 16 Octobre 2017

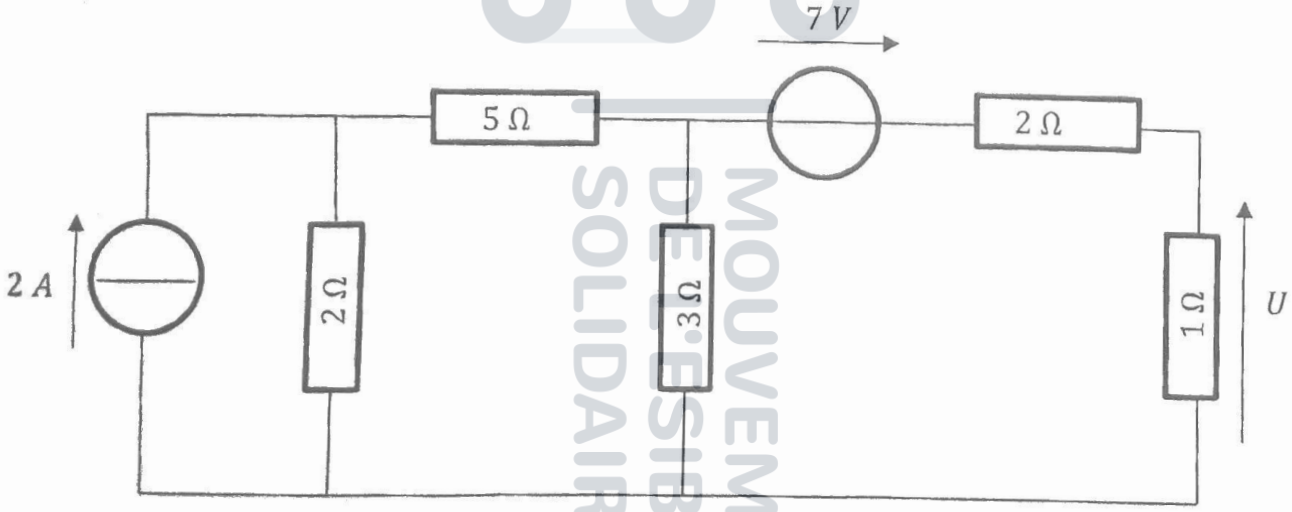
TC 1 : Signaux physiques

Durée : 30 min - Documents interdits - Calculatrices permises - Nb de pages : 1

I. Calculer la valeur de la résistance équivalente entre les deux points A et B.



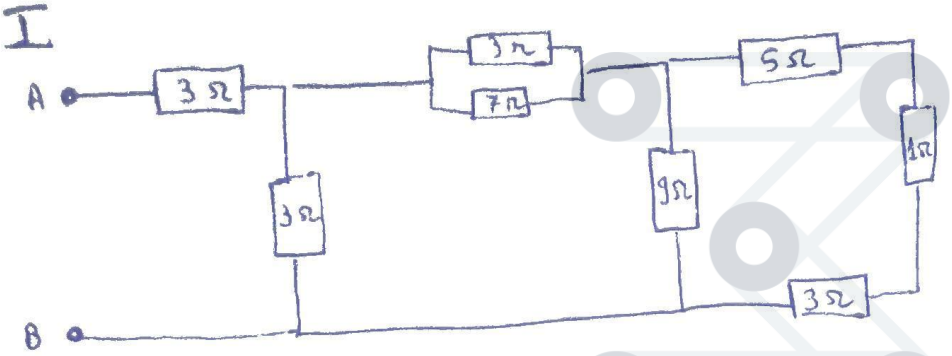
II. En utilisant l'équivalence entre les modèles de Thevenin et de Norton, calculer la valeur de la tension U.

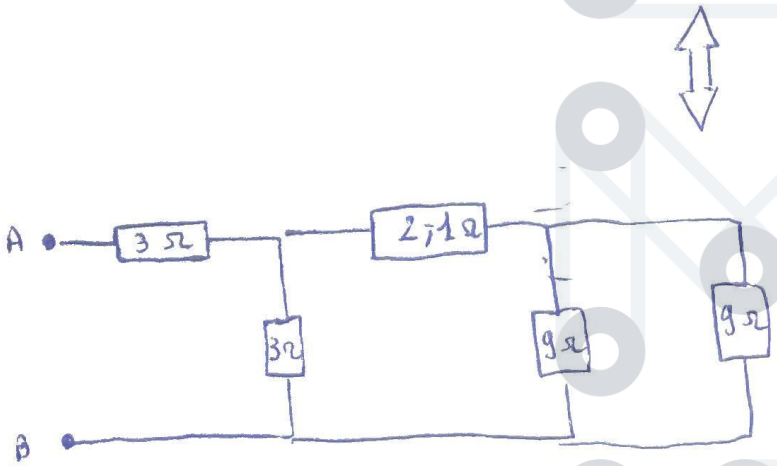


Bon Travail

TC 1 signaux : Correction

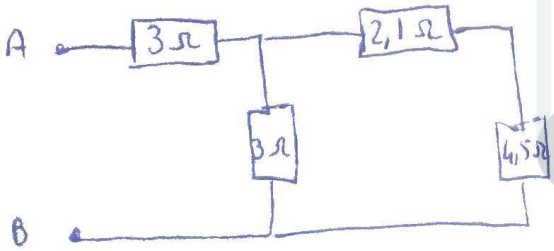
I



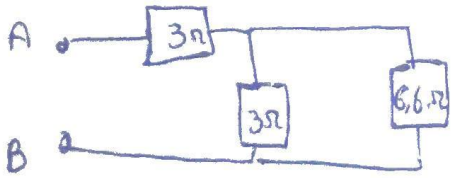


$$R_{eq1} = \frac{3 \times 7}{3+7} = \frac{21}{10} = 2{,}1$$

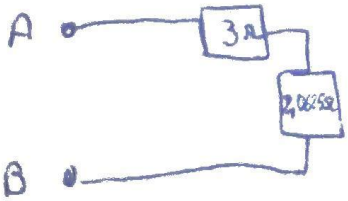
$$R_{eq2} = 3 + 1 + 5 = 9\,\Omega$$



$$R_{eq3} = \frac{9 \times 9}{9+9} = \frac{81}{18} = 4{,}5$$



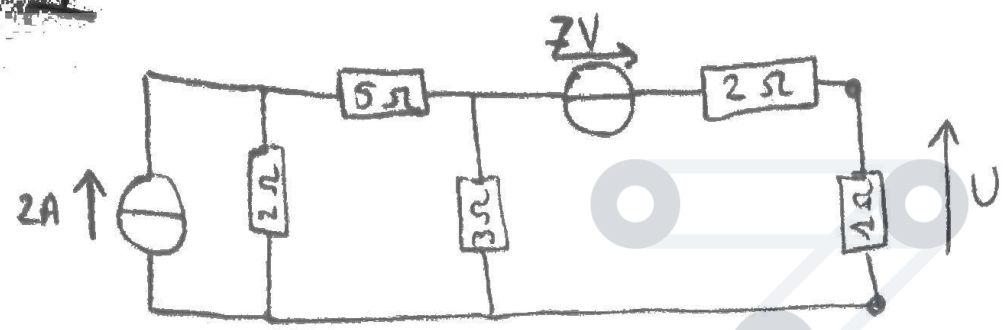
$$R_{eq4} = 2{,}1 + 4{,}5 = 6{,}6$$

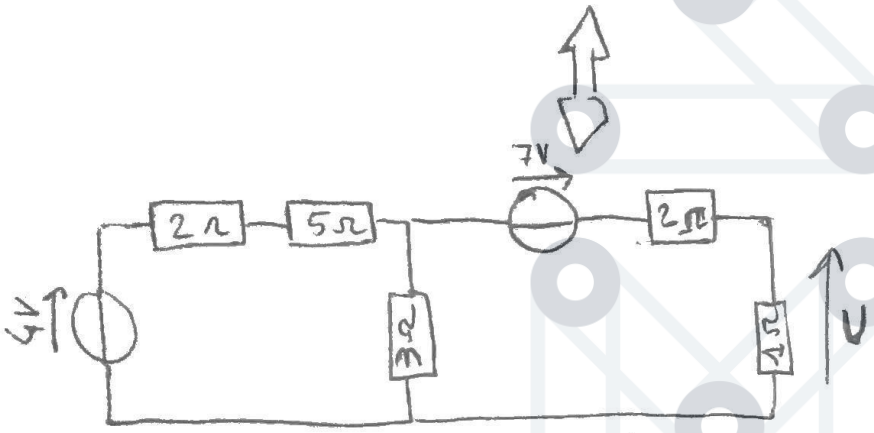


$$R_{eq5} = \frac{3 \times 6{,}6}{9{,}6} = 2{,}0625$$

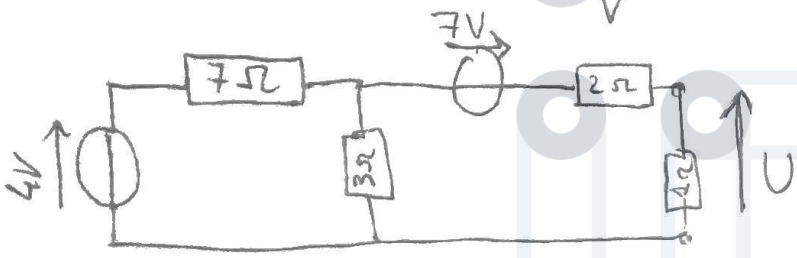
$$\boxed{R_{eq6} = 5{,}0625\,\Omega}$$

II

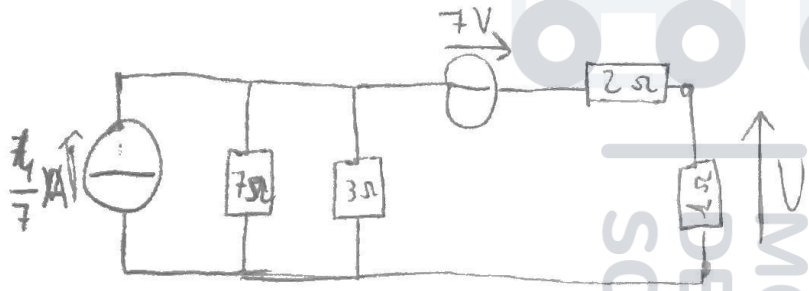




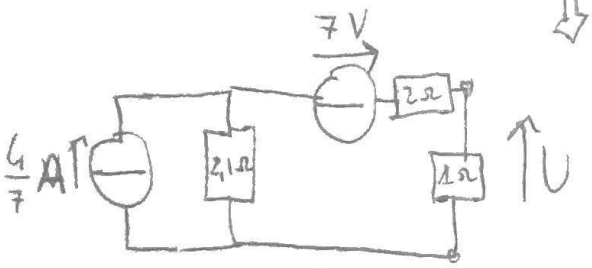
$U = RI = 2 \times 2 = 4\,V$



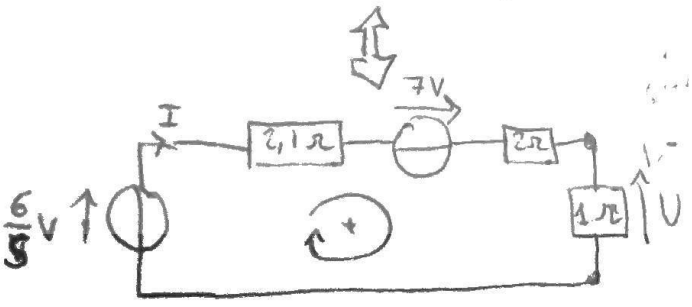
$Req_1 = 2 + 5 = 7\,\Omega$



$I = \frac{U}{R} = \frac{4}{7}\,A$



$Req_2 = \frac{3 \times 7}{3+7} = \frac{21}{10} = 2,1$



$U = R \times I = 2,1 \times \frac{4}{7} = \frac{6}{5}\,V$

Loi des mailles : $\frac{6}{5} - 2,1I + 7 - 2I - I = 0$

$8,2 - 4I = 0$

$4I = 8,2 \Rightarrow I = 2,05\,A$

$U = R \times I = 2,05 \times 1 = 2,05\,V$