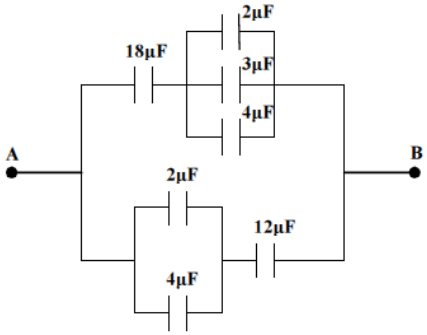
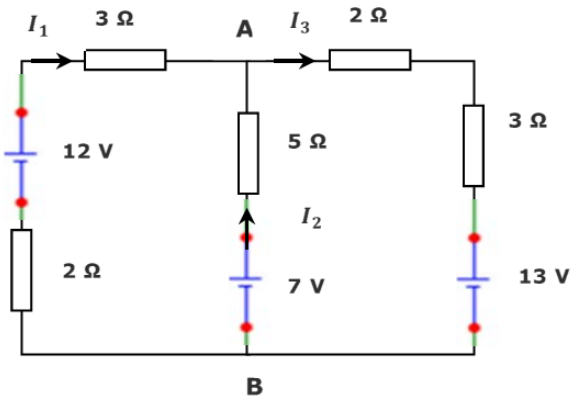
Exercice 1:

Soit le groupement de condensateurs suivant :
Déterminez la capacité équivalente du circuit



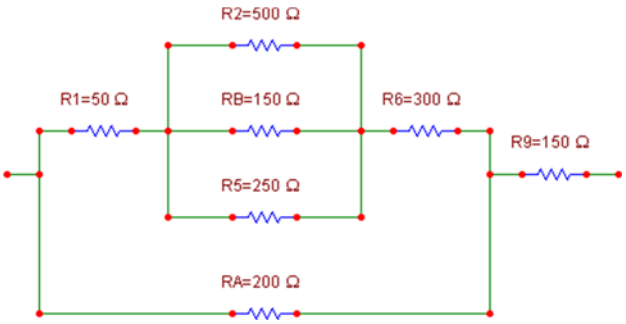
Exercice 2 :

Soit le circuit sur la figure suivante :
1. En appliquant les deux lois de Kirchhoff, écrire les équations correspondant aux nœuds et aux mailles
2. Trouver la valeur des courants I_1, I_2 et I_3.
3. Calculer la différence de potentiel $V_A - V_B$

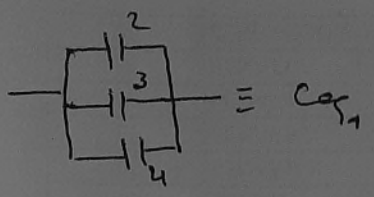


Exercice 3:

Soit le groupement de résistances suivant :
Déterminez la résistance équivalente du circuit

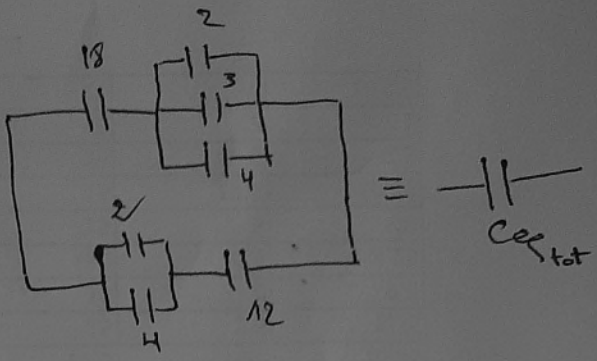


Exo 1 :

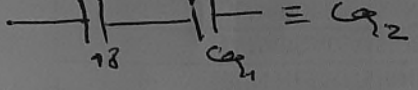


$\equiv C_{eq_1}$

$C_{eq_1} = 2 + 3 + 4 = 9\,\mu F$

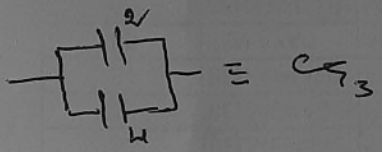


$\equiv C_{eq_{tot}}$



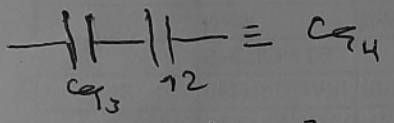
$\equiv C_{eq_2}$

$\frac{1}{C_{eq_2}} = \frac{1}{18} + \frac{1}{C_{eq_1}} = \frac{1}{18} + \frac{1}{9} = \frac{3}{18} = \frac{1}{6} \Rightarrow C_{eq_2} = 6\,\mu F$



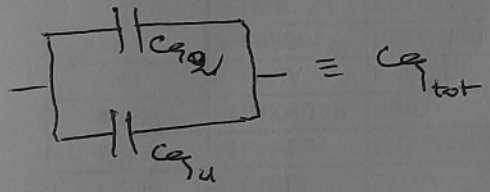
$\equiv C_{eq_3}$

$C_{eq_3} = 2 + 4 = 6\,\mu F$



$\equiv C_{eq_4}$

$\frac{1}{C_{eq_4}} = \frac{1}{6} + \frac{1}{12} = \frac{3}{12} = \frac{1}{4} \Rightarrow C_{eq_4} = 4\,\mu F$



$\equiv C_{eq_{tot}}$

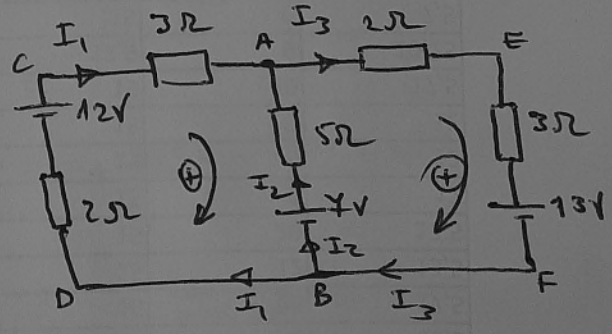
$C_{eq_{tot}} = 4 + 6 = 10\,\mu F$

Exo 2 : maille (ABDC)

$+12 - 3I_1 + 5I_2 - 7 - 2I_1 = 0$ -- (1)

maille (AEFB)

$+7 - 5I_2 - 2I_3 - 3I_3 - 13 = 0$ -- (2)



noeud A :

$I_1 + I_2 = I_3$ -- (3)

noeud B :

$I_3 = I_2 + I_1$

Suite Exo2

$$\begin{cases} -5I_1 + 5I_2 + 5 = 0 \quad -- \quad (1) \\ -6 - 5I_2 - 5I_3 = 0 \quad -- \quad (2) \\ I_3 = I_1 + I_2 \quad -- \quad -- \quad (3) \end{cases}$$

de (1) $\quad I_2 = I_1 - 5$

de (2) $\quad -6 - 5I_2 = 5I_3$

de (3) $\quad I_3 = I_1 + I_2$

on remplace (3) et (1) dans (2)

$$-6 - 5(I_2 - 5) = 5(I_1 + I_1 - 5)$$

$$-6 - 5I_1 + 25 = 10I_1 - 25$$

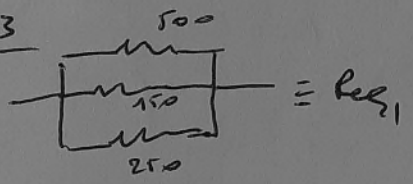
$$5I_1 = 44 \Rightarrow I_1 = \frac{44}{5} = 8,8\ A$$

$I_2 = 3,8\ A$ et $I_3 = 12,6\ A$

3) la différence de potentiel $V_A - V_B$

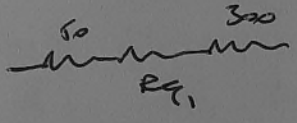
$$+5I_2 - 7 = V_A - V_B = 5(3,8) - 7 = 12\ Volt$$

Exo3



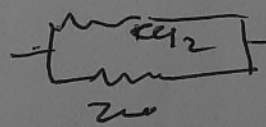
$\equiv Req_1$

$$\frac{1}{Req_1} = \frac{1}{500} + \frac{1}{150} + \frac{1}{250} \Rightarrow Req_1 = 78,94\ \Omega$$



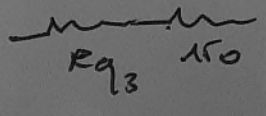
$\equiv Req_2$

$$Req_2 = 50 + 78,94 + 300 = 428,94\ \Omega$$



$\equiv Req_3$

$$\frac{1}{Req_3} = \frac{1}{200} + \frac{1}{428,94} \Rightarrow Req_3 = 176,53\ \Omega$$



$\equiv Req_{tot}$

$$Req_{tot} = 176,53 + 150 = 326,54\ \Omega$$