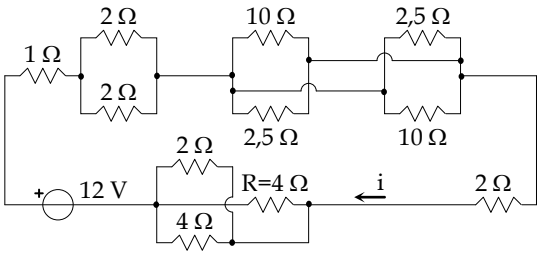
| Cognome | Nome | Matricola | |
|---|---|---|---|
| | | | |

## RECUPERO I prova in itinere

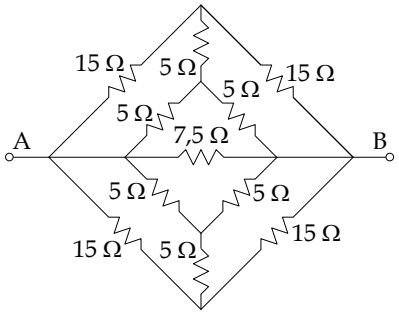
### Esercizio 1

**1** Data la rete in figura, calcolare il valore della corrente i, la potenza dissipata dalla resistenza R e quella erogata dal generatore.



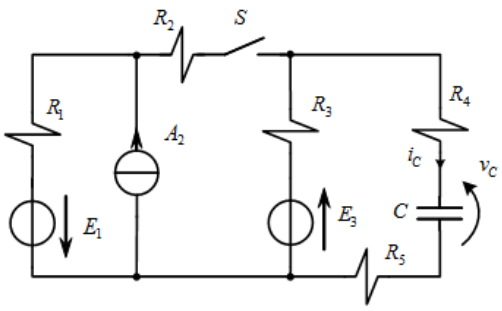

### Esercizio 2

**2** Data la rete in figura, calcolare il valore della resistenza equivalente vista dai morsetti indicati A e B.




### Esercizio 3

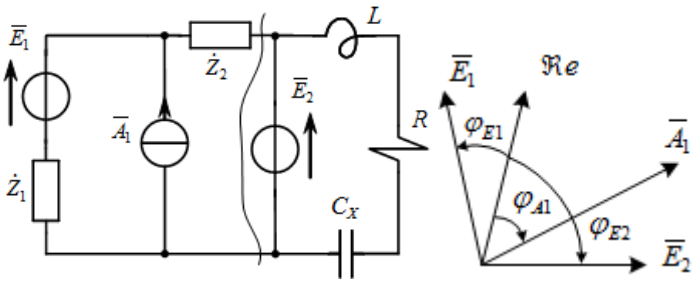
**3** Data la rete in figura, tracciare gli andamenti della tensione $v_C(t)$ e della corrente $i_C(t)$ ai capi del condensatore C conseguenti alla manovra di chiusura dell'interruttore S. Calcolare, inoltre, la variazione di energia accumulata.




| | | |
|---|---|---|
| $E1 = 50V$ | $R_2 = 4\Omega$ | $C=200\ \mu F$ |
| $A_2 = 3\ A$ | $R_3 = 5\ \Omega$ | $E_3 = 75\ V$ |
| $R_1 = 10\ \Omega$ | $R_4 = 9\ \Omega$ | $R_5 = 2\ \Omega$ |

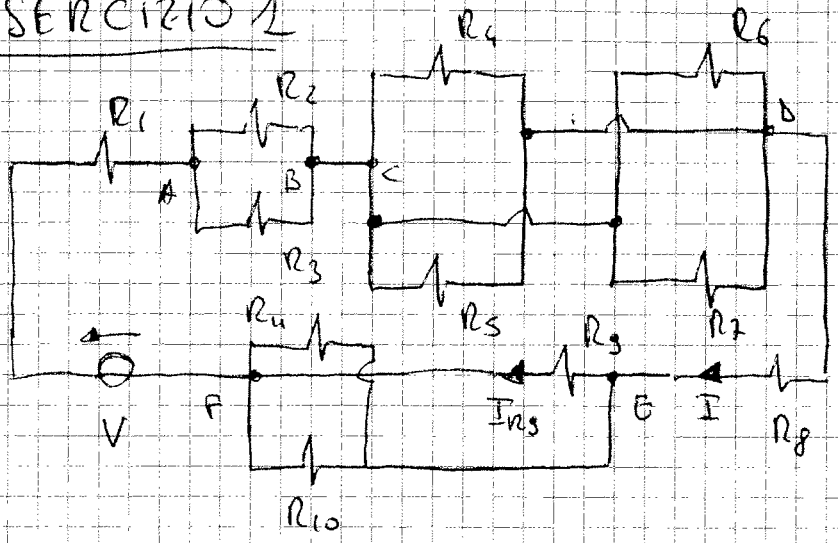
### Esercizio 4

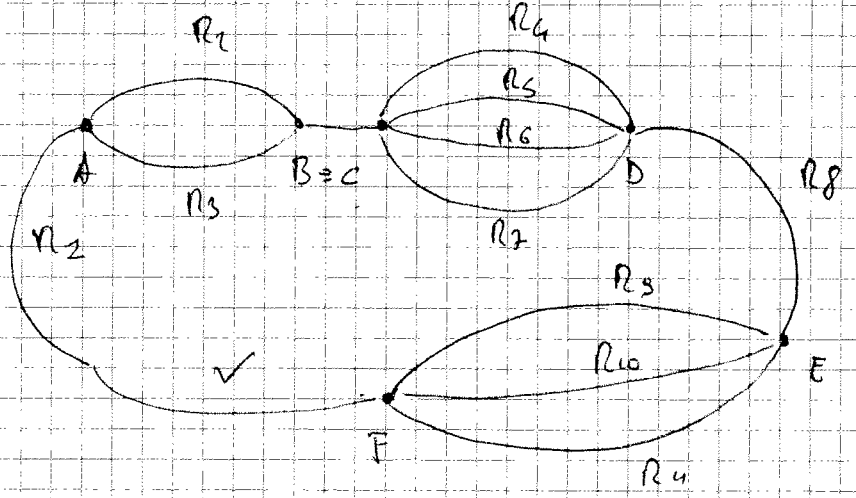
**4** Data la rete in figura, calcolare la potenza apparente complessa elaborata alla sezione indicata. Caratterizzare il comportamento energetico delle due parti di rete(se generatore o carico) indicando i valori di potenza.




| | | | | |
|---|---|---|---|---|
| $E_1=100V$ | $E_2=50V$ | $A_1=2\ A$ | | |
| $Z_1=1+j1\ \Omega$ | $Z_2=7-j3\ \Omega$ | $R=9\ \Omega$ | | |
| $L=150\ mH$ | $C_x= 200\ \mu F$ | $\varphi_{E1}=\pi/6$ | $\varphi_{E2}=\pi/3$ | $\varphi_{A1}=\pi/4$ |

# ESERCIZIO 1




$$R_{EQ} = (R_2 // R_3) + R_1 + (R_4 // R_5 // R_6 // R_7) + R_8 + (R_9 // R_{10} // R_{11}) =$$

$$= R_1 + \left(\frac{1}{R_2} + \frac{1}{R_3}\right)^{-1} + \left(\frac{1}{R_4} + \frac{1}{R_5} + \frac{1}{R_6} + \frac{1}{R_7}\right)^{-1} + R_8 + \left(\frac{1}{R_9} + \frac{1}{R_{10}} + \frac{1}{R_{11}}\right)^{-1} =$$

$$= 6\ \Omega$$

$$I = \frac{V}{R_{EQ}} = 2\ A$$

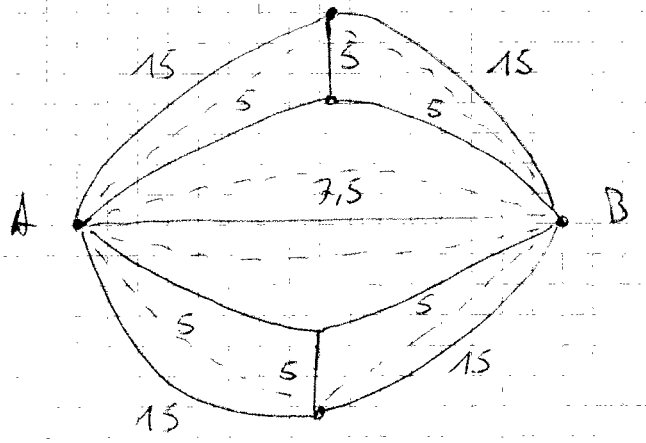
$$P_v = V \cdot I = 24\ W$$

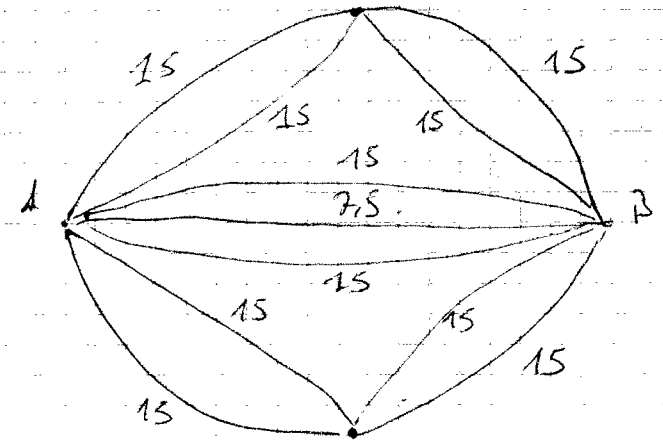
$$I_{R9} = \frac{\frac{1}{R_9}}{\frac{1}{R_9} + \frac{1}{R_{10}} + \frac{1}{R_{11}}} \cdot I = 0{,}5\ A$$

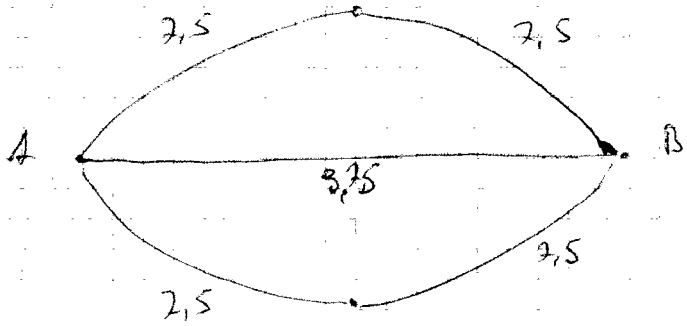
$$P_{R9} = R_9 \cdot I_{R9}^2 = 1\ W$$

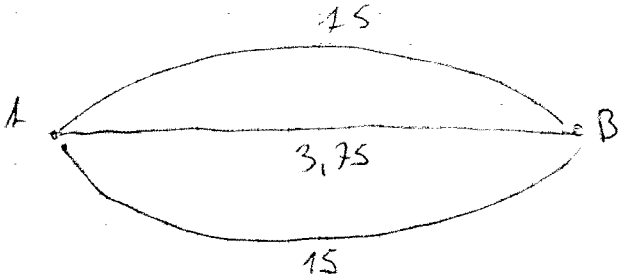
# ESERCIZIO 2

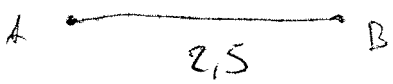
$$R_D = R_A \cdot R_B \left( \frac{1}{R_A} + \frac{1}{R_B} + \frac{1}{R_C} \right)$$



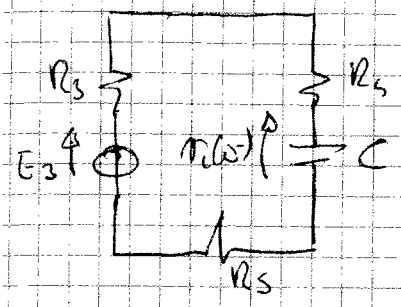



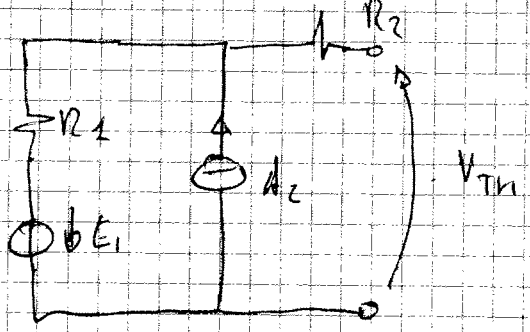
# ESERCIZIO 3

$t = 0^-$



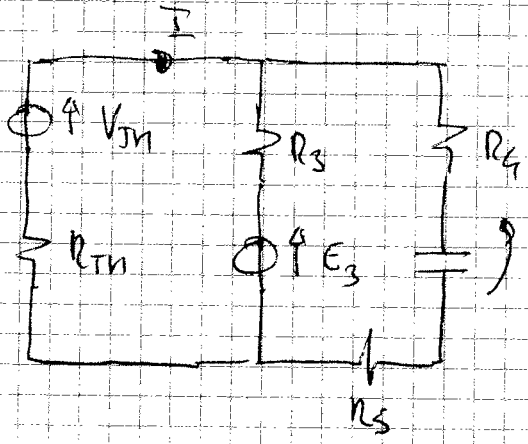

$v_c(0^-) = E_3 = 75\ V$

$t = \infty$




$V_{TH} = -E_1 + R_1 \cdot I_d = -20\ V$

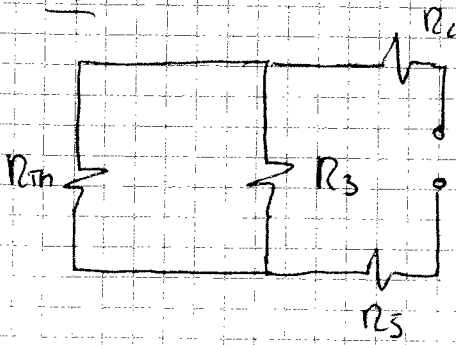
$R_{TH} = R_1 + R_2 = 16\ \Omega$




$I = \dfrac{V_{TH} - E_3}{R_{TH} + R_3} = -5\ A$

$v_c(\infty)\ v_c(\infty) = E_3 + R_3 \cdot I = 50\ V$

$\tau$

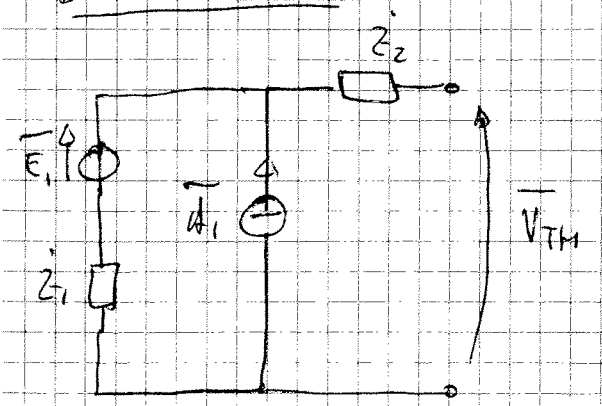



$R_{EE} = R_4 + R_5 + \left(\dfrac{1}{R_{TH}} + \dfrac{1}{R_3}\right)^{-1} = 16,684\ \Omega$

$\tau = R_{EE} \cdot C = 2,932\ ms$

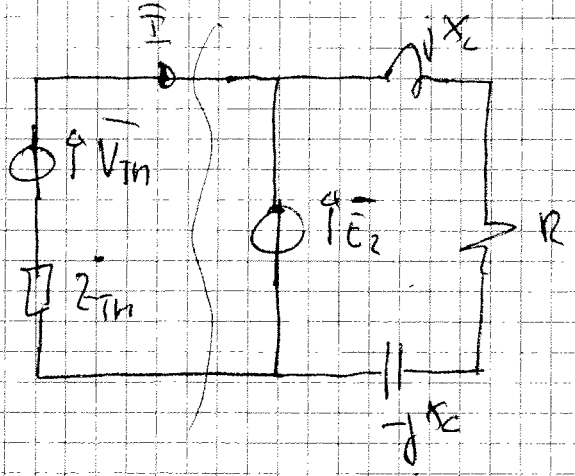
$\Delta W = \dfrac{1}{2} C \left( v_c^2(\infty) - v^2(0^-) \right) = -0,313\ J$

# ESERCIZIO 4




$$\bar{V}_{TH} = \bar{E}_1 + \dot{Z}_1 \bar{A}_1 = 89,631 + j50 \text{ V}$$

$$\dot{Z}_{TH} = \dot{Z}_1 + \dot{Z}_2 = 8 - j2 \ \Omega$$




$$\bar{I} = \frac{\bar{V}_{TH} - \bar{E}_2}{\dot{Z}_{TH}} = 4,836 + j12,872 \text{ A}$$

$$\bar{A} = \bar{E}_2 \cdot \underline{I} = -0,636 - j0,531 \text{ V·A}$$