



Esercitazione 6

• Esercizio 1

Calcola :

$$\begin{array}{llll}
 \text{a)} \frac{2-3j}{4-j} & \text{b)} \frac{3-2j}{1+2j} & \text{c)} \frac{5+5j}{1+2j} + \frac{20}{4+3j} & \text{d)} (1+j)^2 - j \quad \text{e)} 1 + e^{\frac{2j\pi}{3}} + e^{-\frac{2j\pi}{3}} \\
 \text{f)} \frac{j^4 + j^9 + j^{16}}{2-j^5 + j^{10} - j^{15}} & \text{g)} \left\langle \begin{array}{l} 1+j \\ 1-j \end{array} \right. & \text{h)} e^{\frac{j\pi}{2}} & \text{m)} e^{j\pi} \quad \text{n)} e^{-\frac{j\pi}{4}}
 \end{array}$$

Risposte : a) $\frac{11}{17} - \frac{10}{17}j$ b) $-(1+8j)/5$ c) $3-j$ d) j e) 0 f) j g) $\frac{\pi}{2}$ h) j

m) -1 n) $\frac{\sqrt{2}}{2} - j\frac{\sqrt{2}}{2}$

• Esercizio 2

Esprimere in forma esponenziale

$$\begin{array}{llll}
 \text{a)} 2-2j & \text{b)} -1+j\sqrt{3} & \text{c)} 2\sqrt{2} + j2\sqrt{2} & \text{d)} -j \quad \text{e)} -4 \quad \text{f)} -2\sqrt{3} - j2 \quad \text{g)} \sqrt{2} \\
 \text{h)} \frac{\sqrt{3}}{2} - j\frac{3}{2} & & &
 \end{array}$$

Risposte: a) $2\sqrt{2}e^{7j\frac{\pi}{4}}$ b) $2e^{2j\frac{\pi}{3}}$ c) $4e^{j\frac{\pi}{4}}$ d) $e^{-j\frac{\pi}{2}}$ e) $4e^{j\pi}$ f) $4e^{7j\frac{\pi}{6}}$

g) $\sqrt{2}$ h) $\sqrt{3}e^{5j\frac{\pi}{3}}$

• Esercizio 3

Calcolare modulo e fase

$$\begin{array}{llll}
 \text{a)} 1-j & \text{b)} -j & \text{c)} -3 & \text{d)} -1-j \quad \text{e)} -\frac{\sqrt{3}}{2} + \frac{j}{2}
 \end{array}$$

Risposte: a) $\sqrt{2}, -\frac{\pi}{4}$ b) $1, -\frac{\pi}{2}$ c) $3, \pi$ d) $\sqrt{2}, -\frac{3\pi}{4}$ e) $1, \frac{5\pi}{6}$

Esercitazione 6

• **Esercizio 17**

Calcolare la conduttanza e la suscettanza relativa all'impedenza $Z=(50-j100)\Omega$

Risposta : $G=(0.004+j0.008)S$

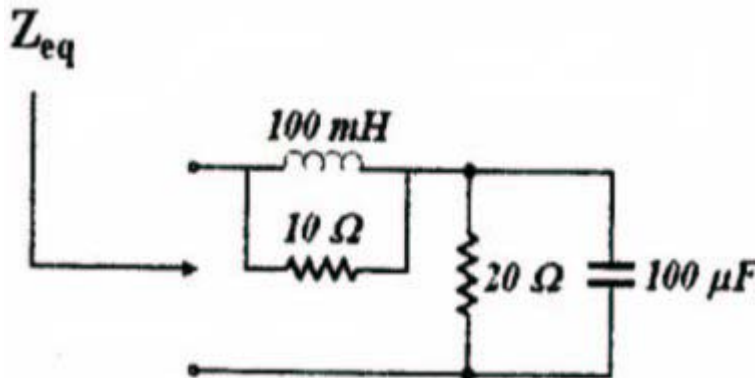
• **Esercizio 18**

Nota l'induttanza $L=100mH$, calcolarne la reattanza, l'impedenza e l'ammettenza Alle frequenze $f_1=50 Hz$ e $f_2=0.5MHz$

Risposta : Per f_1 : $X_1=31.4 \Omega$, $Z_1=j31.4 \Omega$, $Y_1=-j(1/31.4)S$
Per f_2 : $X_2=3.14 M\Omega$, $Z_2=j3.14 M\Omega$

• **Esercizio 19**

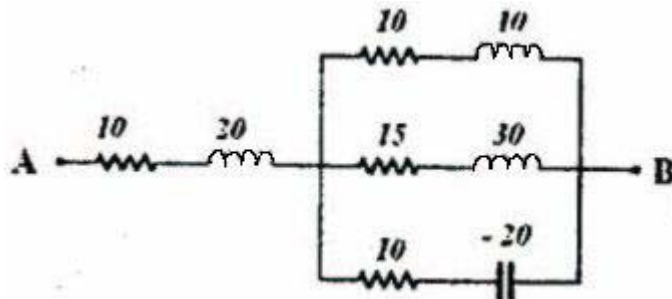
Calcolare l'impedenza Z_{eq} alla pulsazione $\omega=100 rad/s$



Risposta : $Z_{eq} = (315/13+j15/13)\Omega$

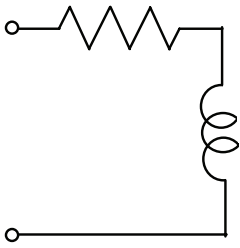
• **Esercizio 20**

Determinare l'ammettenza Y_{ab}



Risposta : $Y_{ab}=(0.02-j0.0245)S$

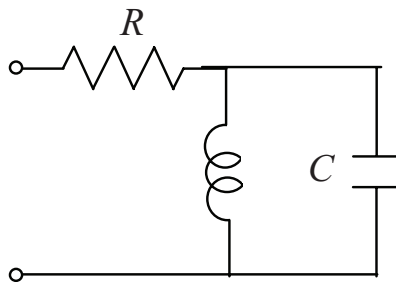
ES. 1.2 Valutare (in coordinate cartesiane e polari) le impedenze viste ai capi dei morsetti:



(a)

$$R = 10 \Omega \quad L = 1 \text{ mH}$$

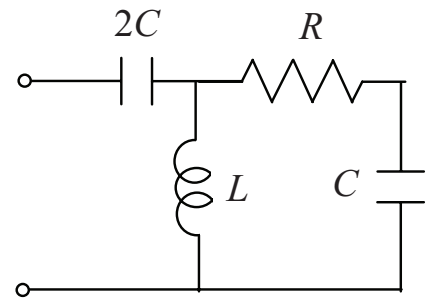
$$\omega = 10^4 \text{ rad/s}$$



(b)

$$R = 8 \Omega, \quad L = 15 \text{ mH}$$

$$C = 0.4 \text{ mF}, \quad f = 50 \text{ Hz}$$



(c)

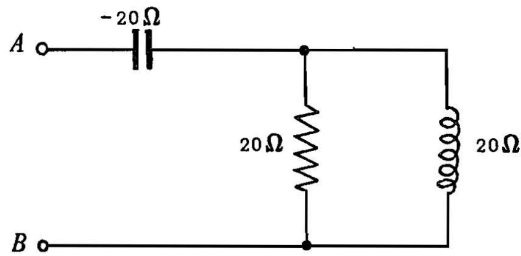
$$R = 200 \Omega, \quad L = 16 \text{ mH}$$

$$C = 10 \mu\text{F}, \quad \omega = 2.5 \cdot 10^3 \text{ rad/s}$$

Risultato: a) $\dot{Z} = 10 + 10j = 10\sqrt{2} \exp(j\pi/4) \Omega$; b) $\dot{Z} = 8 + 11.54j = 14 \exp(j0.965) \Omega$;
c) $\dot{Z} = 8 + 20j = 21.5 \exp(j1.19) \Omega$;

Esercizio: 119.

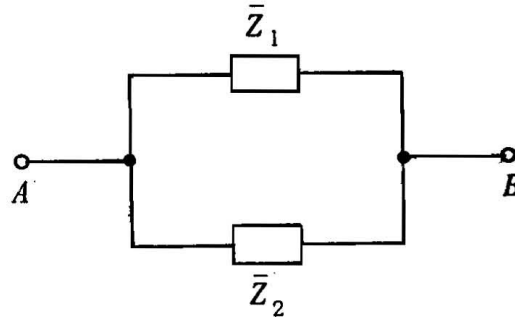
Determinare \bar{Z}_{AB} .



$$(\bar{Z}_{AB} = 10 - j10 \Omega)$$

Esercizio: 120.

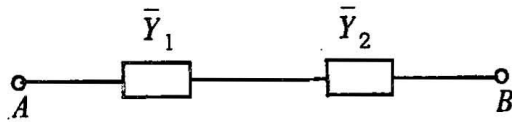
$$\bar{Z}_1 = 8 + j20 \Omega, \bar{Z}_2 = 8 - j20 \Omega$$



Determinare \bar{Z}_{AB} .

$$(\bar{Z}_{AB} = 29 \Omega)$$

Esercizio: 121.



$$\bar{Y}_1 = 10 - j5 \text{ S}$$

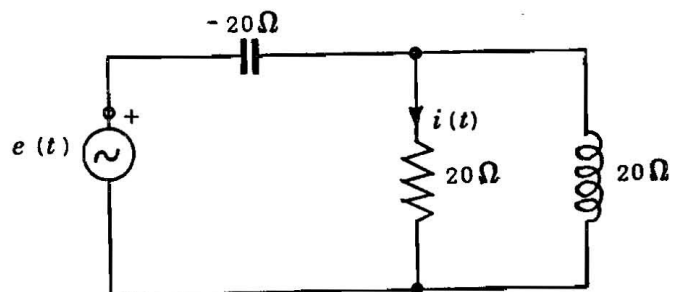
$$\bar{Y}_2 = 4 + j10 \text{ S}$$

Determinare \bar{Y}_{AB} .

$$(\bar{Y}_{AB} \approx 8,1 + j3,27 \text{ S})$$

Esercizio: 122.

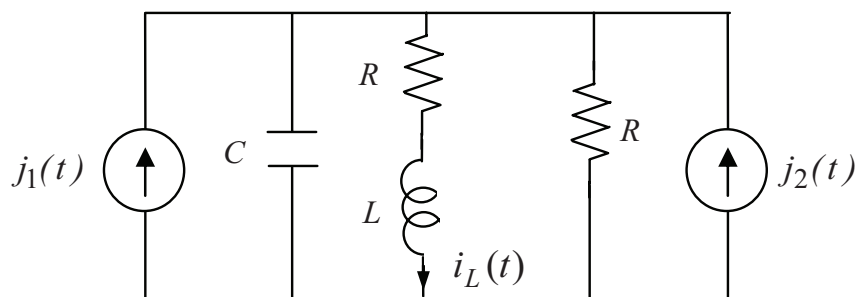
$$e(t) = 100 \sin \omega t \text{ V}$$



Scrivere l'espressione di $i(t)$ in funzione del tempo

$$\left[i(t) = 5 \sin \left(\omega t + \frac{\pi}{2} \right) \text{ V} \right]$$

ES. 2.4 - Con riferimento al seguente circuito valutare la corrente $i_L(t)$.



$$j_1(t) = 10 \cos(1000t) \text{ A}$$

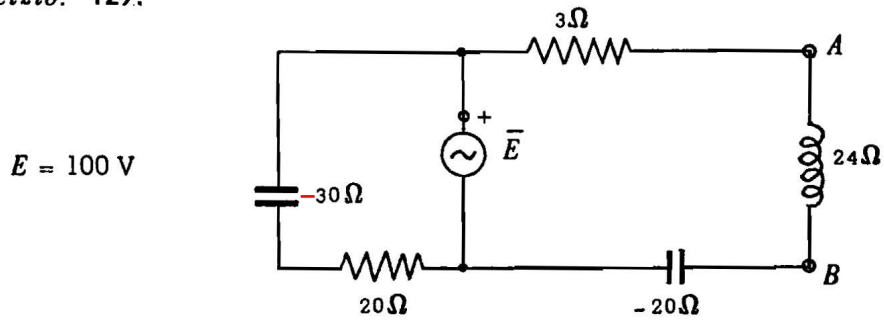
$$j_2(t) = 10 \sin(1000t) \text{ A}$$

$$R = 2 \Omega$$

$$L = 2 \text{ mH}$$

$$C = 1 \text{ mF}$$

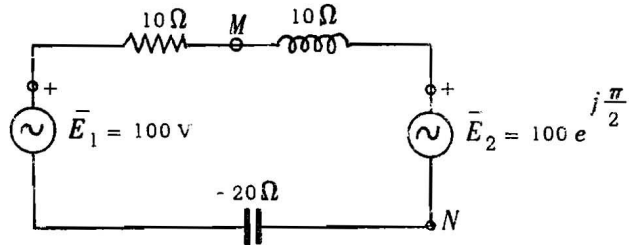
Esercizio: 129.



Determinare \bar{V}_{AB} .

$$(\bar{V}_{AB} \approx 384 + j288 \text{ V})$$

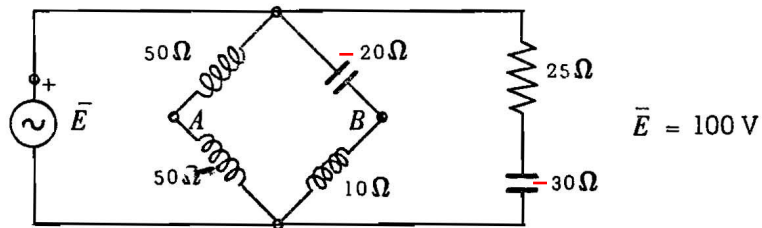
Esercizio: 130.



Determinare \bar{V}_{MN} .

$$(\bar{V}_{MN} = j200 \text{ V})$$

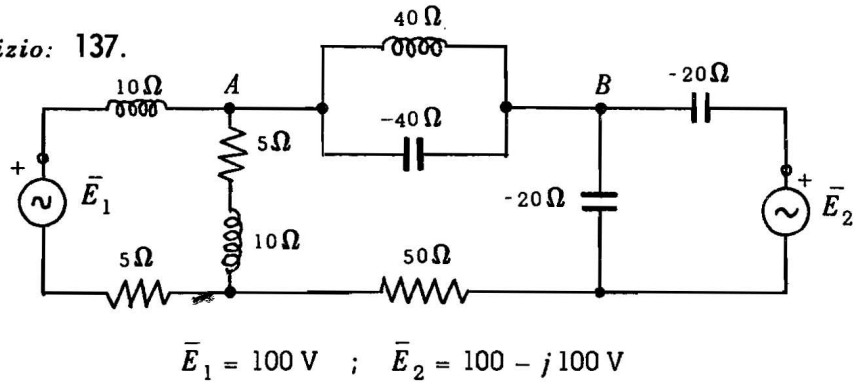
Esercizio: 131.



Determinare \bar{V}_{AB} .

$$(\bar{V}_{AB} = 150 \text{ V})$$

Esercizio: 137.

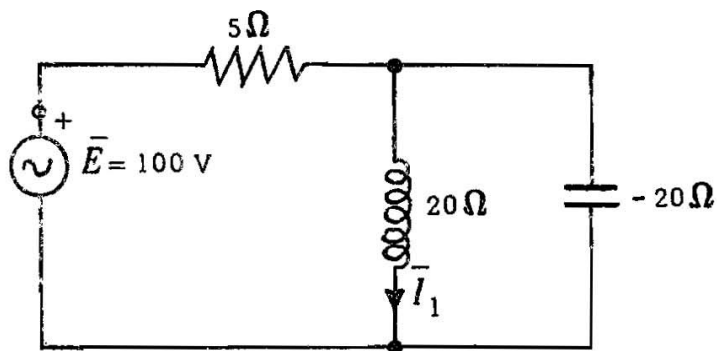


$$\bar{E}_1 = 100 \text{ V} ; \bar{E}_2 = 100 - j100 \text{ V}$$

Determinare \bar{V}_{AB} .

$$(\bar{V}_{AB} = j50 \text{ V})$$

Esercizio: 124.



Determinare \bar{I}_1 .

$$(\bar{I}_1 = -j5)$$

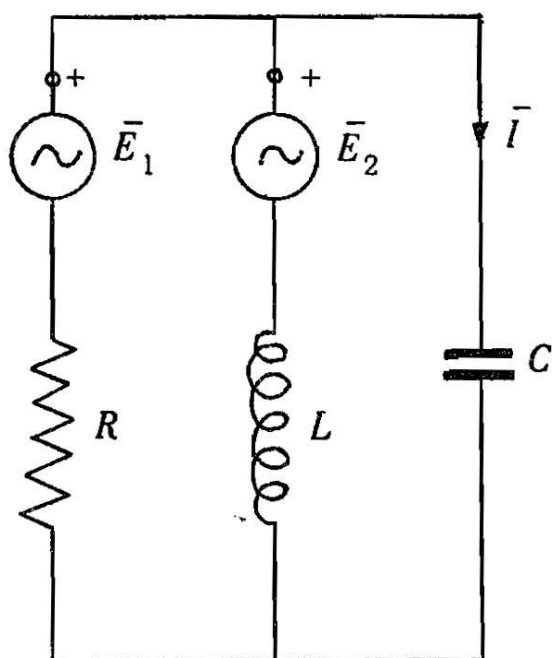
Esercizio: 140.

Calcolare la corrente \bar{I} ; $X_L = 1 \Omega$; $X_C = -10 \Omega$

$$R = 2 \Omega$$

$$\bar{E}_1 = 10 \text{ V}$$

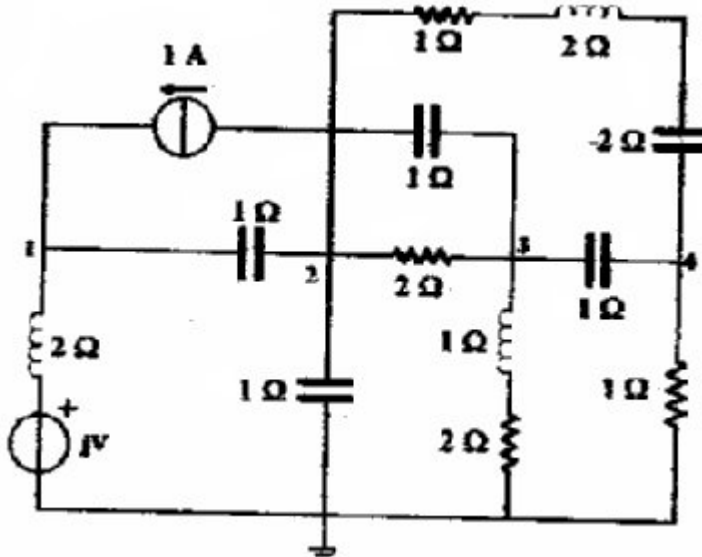
$$\bar{E}_2 = 10 e^{j\frac{\pi}{2}} \text{ V}.$$



Esercitazione 6

• **Esercizio 30**

Nella rete in figura i valori dei bipoli reattivi sono intesi in Ω . Scrivere le equazioni delle tensioni ai nodi 1,2,3 e 4



Risposta : 1) $\left(\frac{2}{5} - j\frac{3}{10}\right)V_1 - \left(\frac{2}{5} - j\frac{1}{5}\right)V_2 = \frac{3}{2}$;

2) $-\left(\frac{2}{5} + j\frac{1}{5}\right)V_1 + \left(\frac{19}{10} + j\frac{11}{5}\right)V_2 - \left(\frac{1}{2} + j\right)V_3 - V_4 = -1$;

3) $-\left(\frac{1}{2} + j\right)V_2 + \left(\frac{9}{10} + j\frac{9}{5}\right)V_3 + jV_4 = 0$;

4) $-V_2 - jV_3 + (2+j)V_4 = 0$

Compiti di esame C.L. Ing. Informatica

(reperibili al seguente link:

<http://www.welfin.diees.unict.it/esg/didattica/elettrotecnica/inf/compiti.html>)

~~compito del 27.03.2017: 2° quesito Light~~

~~compito del 27.03.2017: 2° quesito Standard~~

~~compito del 10.02.2017: 1° quesito Light~~

~~compito del 18.01.2017: 2° quesito Light~~

~~compito del 21.10.2016: 1° quesito Light~~

~~compito del 01.09.2016: 2° quesito Light~~

~~compito del 04.07.2016: 1° quesito Light~~

Compiti di esame C.L. Ing. Elettrica, C.L. Ing. Informatica e C.L. Ing. Industriale

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~~compito del 06.06.2016: 2° quesito~~

~~compito del 30.11.2015: 2° quesito~~

~~compito del 05.10.2015: 2° quesito~~

~~compito del 26.06.2015: 2° quesito~~

~~compito del 15.04.2015: 2° quesito~~

~~compito del 28.11.2014: 2° quesito~~

~~compito del 25.02.2014: 2° quesito~~

~~compito del 28.06.2013: 2° quesito~~

~~compito del 22.02.2013: 2° quesito~~

Teorema del massimo trasferimento di potenza

Compiti di esame C.L. Ing. Informatica

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compito del 26.04.2017: 2° quesito Standard

compito del 26.04.2017: 2° quesito Light

compito del 16.12.2016: 2° quesito Standard

compito del 16.12.2016: 2° quesito Light

compito del 26.07.2016: 2° quesito Standard

compito del 26.07.2016: 2° quesito Light

Compiti di esame C.L. Ing. Informatica e C.L. Ingegneria Industriale

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compito del 27.04.2016: 2° quesito

~~compito del 25.01.2016: 2° quesito~~

~~compito del 10.07.2015: 2° quesito~~

~~compito del 10.07.2014: 2° quesito~~

~~compito del 08.11.2013: 1° quesito~~

~~compito del 12.04.2013: 2° quesito~~

~~compito del 07.09.2012: 2° quesito~~

compito del 09.07.2012: 2° quesito