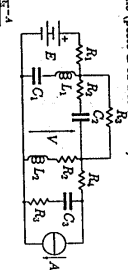
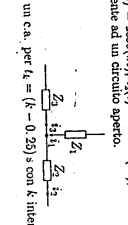
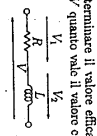
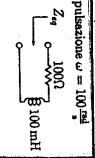
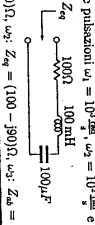
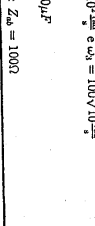
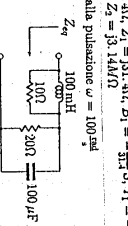
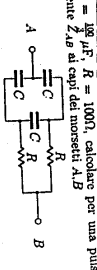
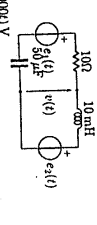
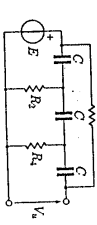
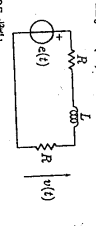
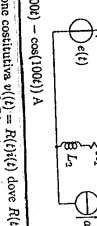
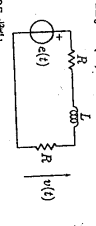
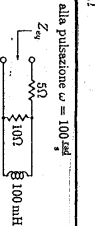
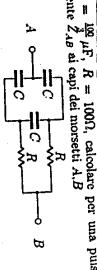
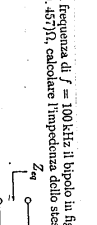
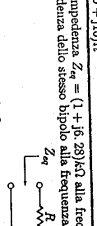
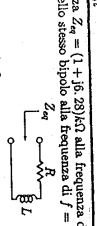
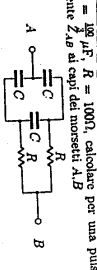
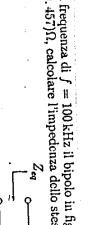
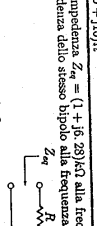
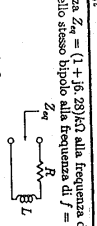
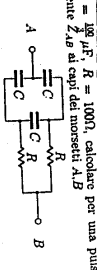
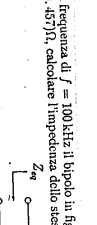
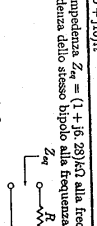
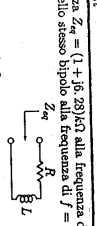
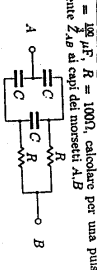
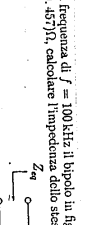
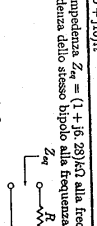
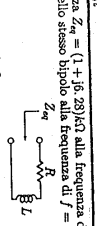
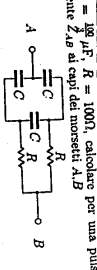
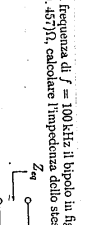
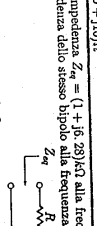
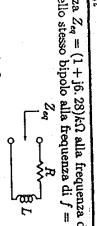
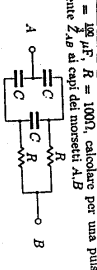
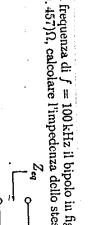
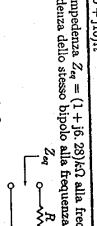
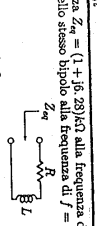
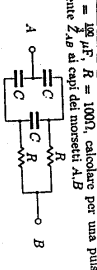
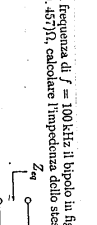
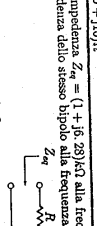
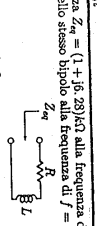
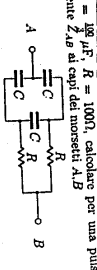
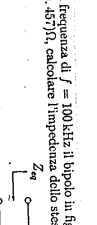
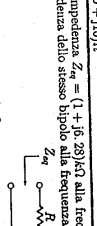
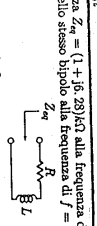
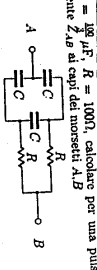
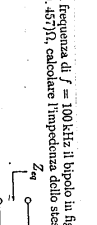
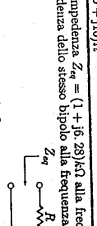
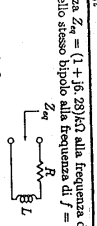
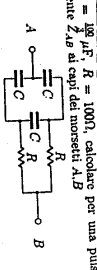
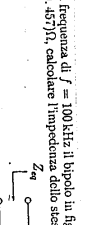
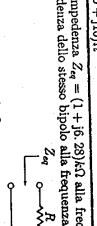
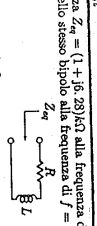
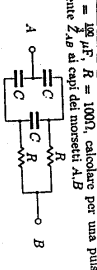
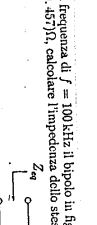
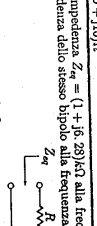
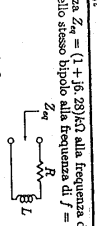
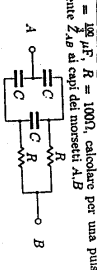
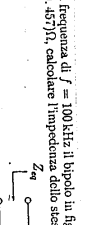
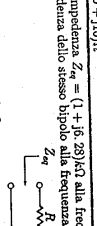
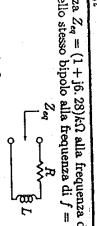
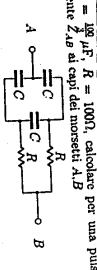
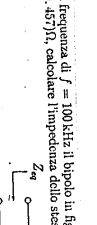
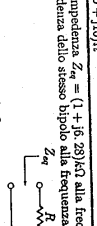
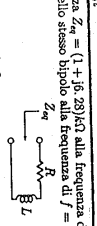
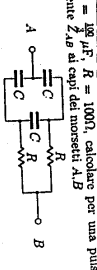
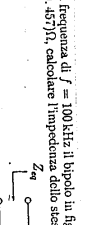
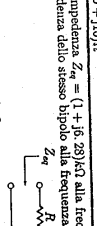
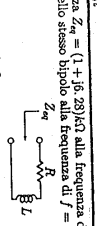
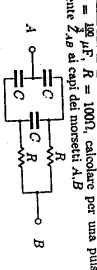
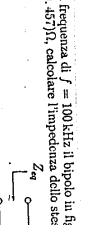
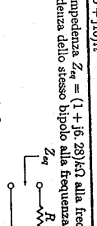
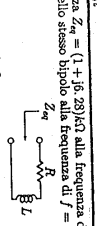
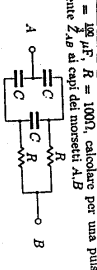
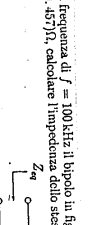
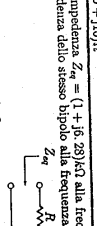
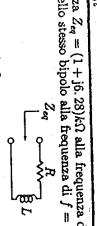
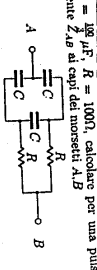
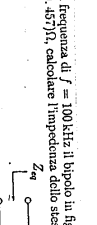
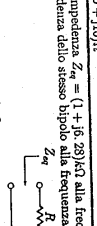
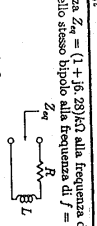
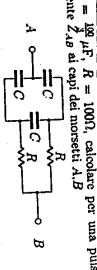
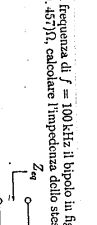
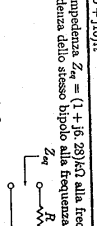
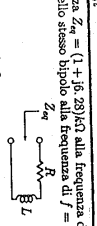
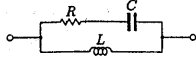


ESERCITAZIONE 6

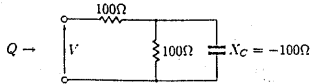
<p>Calcolare:</p> <p>a) $\frac{1-j}{1+j}$ b) $\frac{1-j}{1+j} + \frac{1-j}{1+j}$ c) $\frac{1-j}{1+j} + \frac{1-j}{1+j}$ d) $1 + j^2 + e^{-j}$ f) $\frac{1-j}{1+j} + \frac{1-j}{1+j}$ g) $\frac{1-j}{1+j}$ h) $\frac{1-j}{1+j}$ m) $\frac{1-j}{1+j}$ n) $\frac{1-j}{1+j}$ o) $\frac{1-j}{1+j}$</p> <p>Risposte:</p> <p>a) $\frac{1-j}{1+j}$ b) $\frac{1-j}{1+j}$ c) $\frac{1-j}{1+j}$ d) $1 + j^2 + e^{-j}$ f) $\frac{1-j}{1+j}$ g) $\frac{1-j}{1+j}$ h) $\frac{1-j}{1+j}$ m) $\frac{1-j}{1+j}$ n) $\frac{1-j}{1+j}$ o) $\frac{1-j}{1+j}$</p>	<p>Esprimere in forma esponenziale:</p> <p>a) $2 - 3j$ b) $-1 + \sqrt{3}j$ c) $2\sqrt{2} + 2\sqrt{3}j$ d) $-j$ e) $-1 - 2\sqrt{3} - 2j$ f) $\sqrt{2}$ g) $\sqrt{2}$ h) $\frac{\sqrt{2}}{2} - \frac{j}{2}$ i) $\frac{\sqrt{2}}{2}$</p> <p>Risposte:</p> <p>a) $2\sqrt{2}e^{j\pi/4}$ b) $2e^{j\pi/4}$ c) $4e^{j\pi/4}$ d) $e^{-j\pi/4}$ e) $4e^{j\pi/4}$ f) $4e^{j\pi/4}$ g) $\sqrt{2}e^{j\pi/4}$ h) $\sqrt{2}e^{j\pi/4}$ i) $\sqrt{2}e^{j\pi/4}$</p>	<p>Calcolare modulo e fase:</p> <p>a) $1 - j$ b) $-j$ c) $-j$ d) $-1 - j$ e) $-j + j$ f) $2 + j$ g) $\frac{1}{2}$ h) j m) -1 n) $\frac{1}{2}$ o) $\frac{1}{2}$</p> <p>Risposte:</p> <p>a) $\sqrt{2} - \frac{\pi}{4}$ b) $1 - \frac{\pi}{2}$ c) $3, \pi$ d) $\sqrt{2}, -\frac{\pi}{4}$ e) $1, \frac{\pi}{4}$ f) $2 + j$ g) $\frac{1}{2}$ h) j m) -1 n) $\frac{1}{2}$ o) $\frac{1}{2}$</p>	<p>Calcolare modulo e fase:</p> <p>a) $1 - j$ b) $-j$ c) $-j$ d) $-1 - j$ e) $-j + j$ f) $2 + j$ g) $\frac{1}{2}$ h) j m) -1 n) $\frac{1}{2}$ o) $\frac{1}{2}$</p> <p>Risposte:</p> <p>a) $\sqrt{2} - \frac{\pi}{4}$ b) $1 - \frac{\pi}{2}$ c) $3, \pi$ d) $\sqrt{2}, -\frac{\pi}{4}$ e) $1, \frac{\pi}{4}$ f) $2 + j$ g) $\frac{1}{2}$ h) j m) -1 n) $\frac{1}{2}$ o) $\frac{1}{2}$</p>
<p>Riproporzionare e riformulare i fasori relativi alle seguenti funzioni sinusoidali</p> <p>Risposte:</p> <p>$f(t) = 3\sin(\omega t) - 2\cos(\omega t)$ $f(t) = -4\sin(\omega t + \frac{\pi}{3})$</p>	<p>Calcolare V a regime (posto E ed A costanti):</p>  <p>Risposte: $V = \frac{\pi R_1 R_2}{R_1 R_2 + R_3 R_4}$</p>	<p>Nota: le correnti $i_1(t)$ e $i_2(t) = 2\cos(\omega t)$ determinate per quale istante t il bipolo Z_2 è equivalente ad un circuito aperto.</p>  <p>Risposte: $t = 1V, V = \sqrt{2}V$</p>	<p>Nota: $V_1 = 1V, V_2 = 1V$ determinare il valore efficace di V. Se i valori efficaci di $V_1 = \frac{1}{2}$ sono $V_2 = 1V, V_3 = 1V$ quanto vale il valore efficace di V?</p>  <p>Risposte: $f_1 = \cos(\omega t) - \sin(\omega t)$ $f_2 = \frac{2}{\sqrt{2}} \sin(\omega t - 2t + \frac{\pi}{4})$</p>
<p>Calcolare l'impedenza Z_{eq} alla pulsazione $\omega = 100 \text{ rad/s}$</p>  <p>Risposte: $Z_{eq} = (100 + j100)\Omega$</p>	<p>Calcolare l'impedenza Z_{eq} alle pulsazioni $\omega_1 = 10^3 \text{ rad/s}, \omega_2 = 10^2 \text{ rad/s}$ e $\omega_3 = 100\sqrt{10} \text{ rad/s}$</p>  <p>Risposte: $\omega_1: Z_{eq} = (100 + j90)\Omega, \omega_2: Z_{eq} = (100 - j90)\Omega, \omega_3: Z_{eq} = 100\Omega$</p>	<p>Nota: la frequenza di $f = 100 \text{ kHz}$ il bipolo in figura mostra un'impedenza $Z_{eq} = (716 - j975 - j150) \Omega$, calcolare l'impedenza dello stesso bipolo alla frequenza di $f = 1 \text{ MHz}$.</p>  <p>Risposte: $Z_{eq} = (10 + j10)\Omega$</p>	<p>Nota: l'induttanza $L = 100 \text{ mH}$, calcolare la reattanza, l'impedenza, e l'ammortenuamento a frequenza $f_1 = 50 \text{ Hz}, f_2 = 0, 5 \text{ MHz}$</p> <p>Risposte: $f_1: X_L = 31,4\Omega, Z_L = j31,4\Omega, P = -\frac{1}{2} \text{ W}, Y = -\frac{1}{2} \text{ S}$ $f_2: X_L = 31437\Omega, Z_L = j31,437\Omega$</p> <p>Calcolare l'impedenza Z_{eq} alla pulsazione $\omega = 100 \text{ rad/s}$</p>  <p>Risposte: $Z_{eq} = (10 + j10)\Omega$</p>
<p>Nota: i parametri $C = \frac{10}{100} \mu\text{F}, R = 100\Omega$, calcolare per una pulsazione $\omega = 100 \text{ rad/s}$ l'impedenza equivalente Z_{eq} ai capi dei morsetti A,B</p>  <p>Risposte: $Z_{eq} = (100 + j100)\Omega$</p>	<p>Nota: gli ingressi $e_1(t) = 100\cos(1000t)V, e_2(t) = -100\sin(1000t)V$ calcolare la tensione $v(t)$ a regime.</p>  <p>Risposte: $v(t) = -200\sin(1000t)V$</p>	<p>Nota: $f = 1 \text{ kHz}, R = 125\Omega, C = 159 \mu\text{F}$, determinare R_1, R_2 tali che $V_0 = 0$</p>  <p>Risposte: $R_1 = 100\Omega, R_2 = 100\Omega$</p>	<p>Calcolare $v(t)$ noto $e(t) = 2E_0 \cos^2(\omega t)$</p>  <p>Risposte: $v(t) = \frac{E_0}{2} + R_1 \frac{E_0 \cos(2\omega t)}{2R_2}$</p>
<p>Calcolare la conduttanza e la suscettanza relative all'impedenza $Z = (50 - j100)\Omega$</p> <p>Risposte: $G = 0,004 + j0,008 \text{ S}$</p>	<p>Calcolare $v(t)$ e $i(t)$ a regime noti $e(t) = 20\cos(100t)V$ e $i(t) = -3\sin(100t)A$</p>  <p>Risposte: $i(t) = 5\sin(100t) - \cos(100t)A$</p>	<p>Calcolare $v(t)$ noto $e(t) = 2E_0 \cos^2(\omega t)$</p>  <p>Risposte: $v(t) = \frac{E_0}{2} + R_1 \frac{E_0 \cos(2\omega t)}{2R_2}$</p>	<p>Calcolare l'impedenza Z_{eq} alla pulsazione $\omega = 100 \text{ rad/s}$</p>  <p>Risposte: $Z_{eq} = (1 + j0,633)\Omega$</p>
<p>Calcolare l'impedenza Z_{eq} alla pulsazione $\omega = 100 \text{ rad/s}$</p>  <p>Risposte: $Z_{eq} = (100 + j100)\Omega$</p>	<p>Calcolare l'impedenza Z_{eq} alla pulsazione $\omega = 100 \text{ rad/s}$</p>  <p>Risposte: $Z_{eq} = (100 + j100)\Omega$</p>	<p>Calcolare l'impedenza Z_{eq} alla pulsazione $\omega = 100 \text{ rad/s}$</p>  <p>Risposte: $Z_{eq} = (100 + j100)\Omega$</p>	<p>Calcolare l'impedenza Z_{eq} alla pulsazione $\omega = 100 \text{ rad/s}$</p>  <p>Risposte: $Z_{eq} = (100 + j100)\Omega$</p>
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<p>Calcolare l'impedenza Z_{eq} alla pulsazione $\omega = 100 \text{ rad/s}$</p>			

Valutare il ω alla quale il bipolo ha un comportamento puramente resistivo. Si determini in particolare per $R = 5\Omega$, $L = 0.1\text{H}$, $C = 100\mu\text{F}$



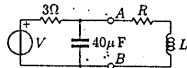
Riposta: $\omega = \sqrt{\frac{1}{LC} - \frac{R^2}{4L^2}}$

Valutare $|V|$ sapendo che il bipolo assorbe una potenza reattiva $Q = 5\text{VAR}$



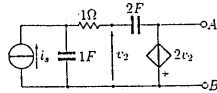
Riposta: $|V| = \frac{100}{\sqrt{2}}\text{V}$

Nel circuito operante alla $f = 1\text{kHz}$: valutare R , L in modo che il generatore di morsetti A-B eroghi P_d , e per quale $|V|$ la sua $P_d = 2\text{W}$



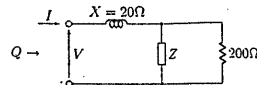
Riposta: $R \approx 1.91\Omega$, $L \approx 0.23\text{mH}$, $|V| \approx 3.5\text{V}$

Calcolare il circuito equivalente di Norton ai morsetti A-B noto $i_s(t) = 10\sin(\omega t + \frac{\pi}{6})$



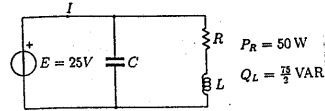
Riposta: Impossibile

Valutare l'impedenza del bipolo, che in regime sinusoidale assorbe una potenza reattiva $Q = 800\text{VAR}$ e che $|I| = 5\text{A}$ e $|V| = 400\text{V}$



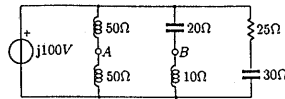
Riposta: $Z = \frac{200}{318}(67 + j110)\Omega$

Valutare C in modo che $\langle E - \langle I = \phi > > 0 \cos\phi = 0.9$ per una pulsazione $\omega = 50\text{rad/s}$



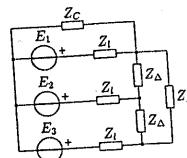
Riposta: $C \approx 850\mu\text{F}$

Calcolare il circuito equivalente Thevenin ai morsetti A-B



Riposta: $V_c = j150\text{V}$, $Z_{eq} = j45\Omega$

Determinare I_c



$E_1 = 220\text{V}$
 $E_2 = 220e^{-j\frac{\pi}{3}}\text{V}$
 $E_3 = 220e^{+j\frac{\pi}{3}}\text{V}$
 $Z_1 = 16(1 + j)\Omega$
 $Z_2 = 10(1 + j)\Omega$
 $Z_3 = 5\Omega$

Riposta: $I_c \approx (-2.3 + j1.4)\text{A}$