ANÁLISE DE CIRCUITOS II Prof. : Alexandre Moreira
Aluno:.....

Lista de Exercícios 5 – Fasores, Reatância Indutiva e Capacitiva, Impedância, Calculo de Corrente e Tensão nos elementos dos circuitos

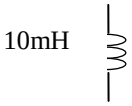
1. Expressar sob a forma de fasores

a) $v_1(t) = 50 \text{ sen } (200t)$ (V)
b) $i_1(t) = 100 \text{ sen}(1000t + 60^o)$ (A)
c) $v_2(t) = 20 \text{ sen}(10t-90^o)$ (V)

2. Expressar sob a forma de impedância

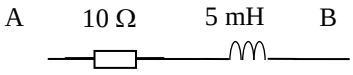
a) f=100 KHz

b) f= 10 MHz

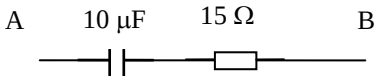


3. Para as associações a seguir, determinar a impedância equivalente vista pelos pontos A e B:

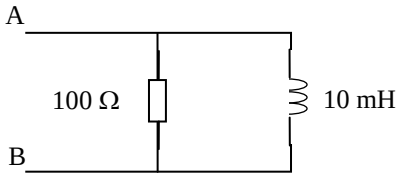
a) f = 1000 Hz



b) f =5000 Hz

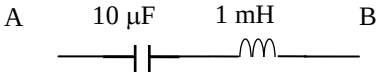


c) w = 1000 rad/s



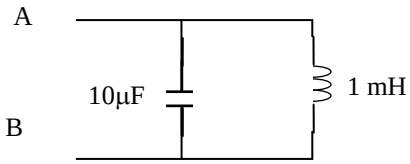
4. Determine a impedância equivalente vista dos pontos A e B considerando as velocidades angulares abaixo:

a)

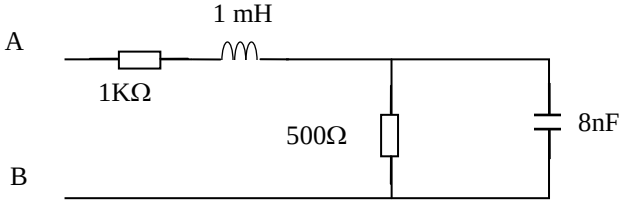


w= 1000 rad/s
w= 10000 rad/s
w = 100000 rad/s

b)

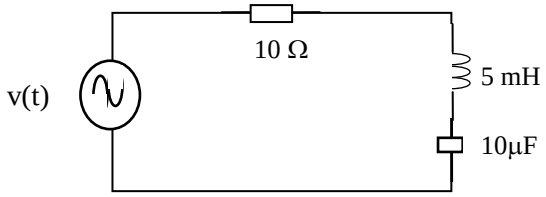


c)



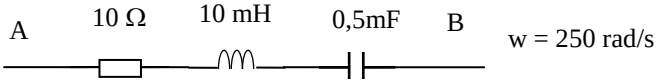
5. Representar o circuito abaixo no domínio frequência, calcule Z e i(t)

v(t) = 5 sen (5000t) (V)

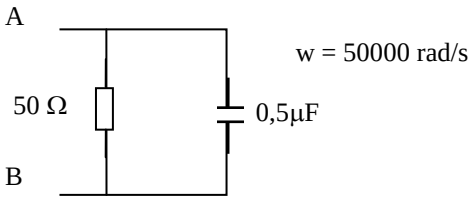


6. Determine a impedância equivalente vista pelos pontos A e B

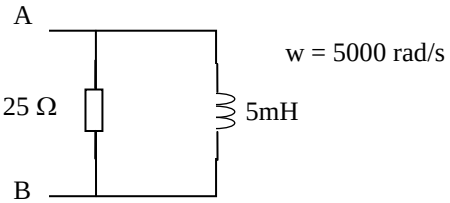
a)



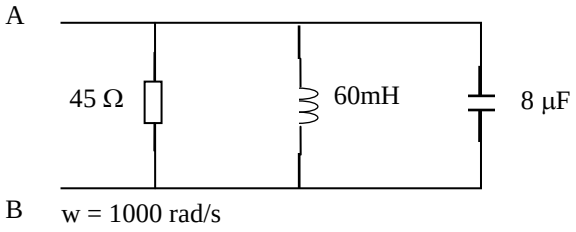
b)



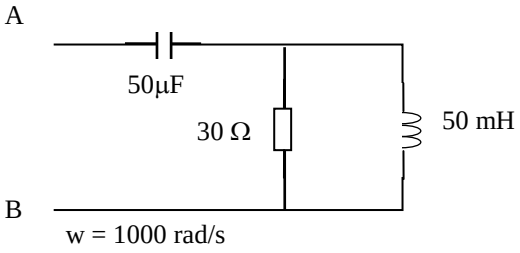
c)



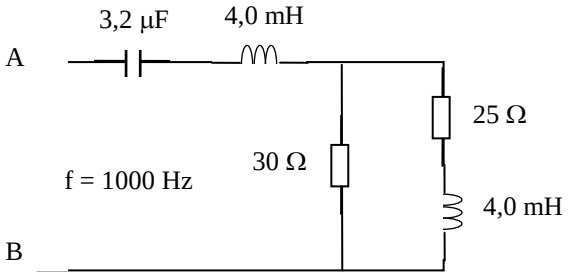
d)



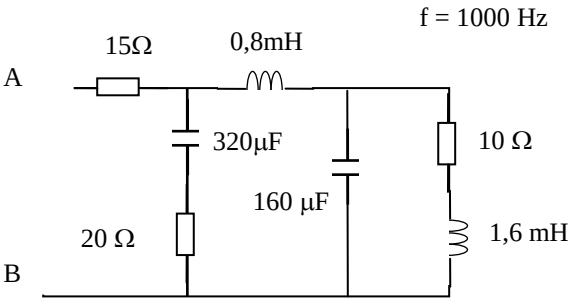
e)



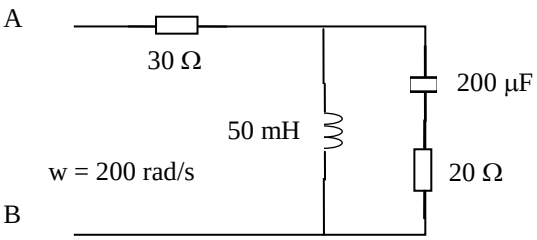
f)



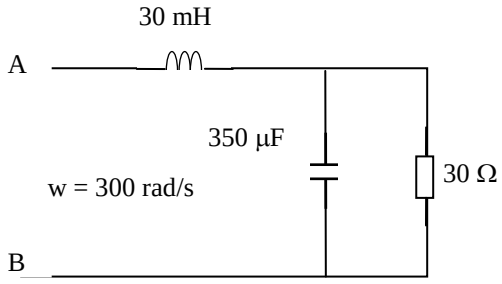
g)



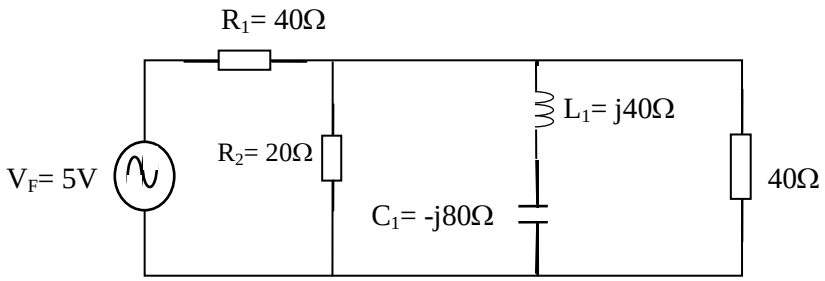
h)



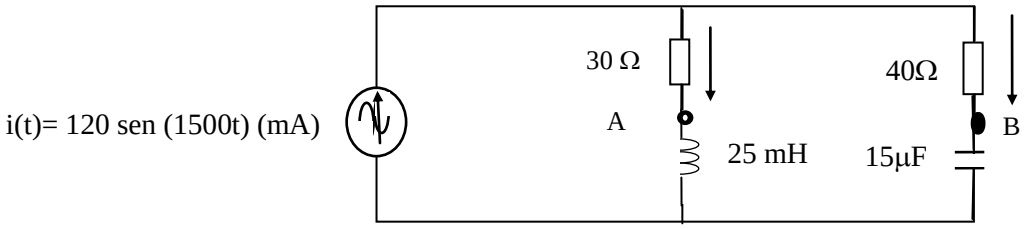
i)



7. Dado o circuito abaixo determinar: **Zeq**

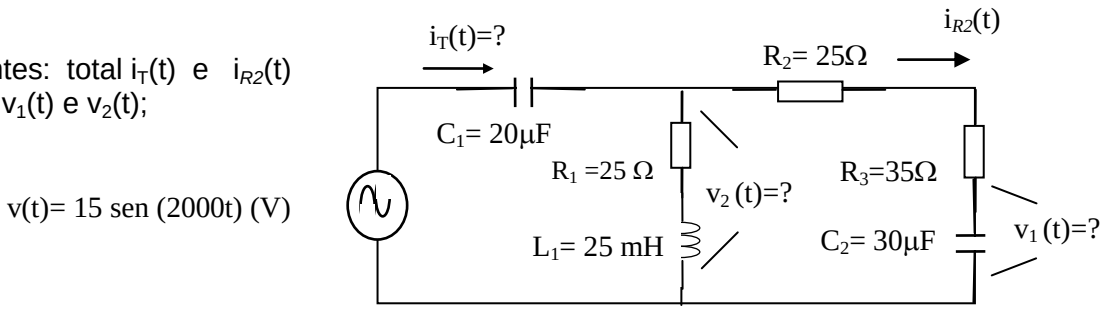


8. Dado o circuito abaixo determinar: **Zeq** . E a tensão entre os pontos A e B



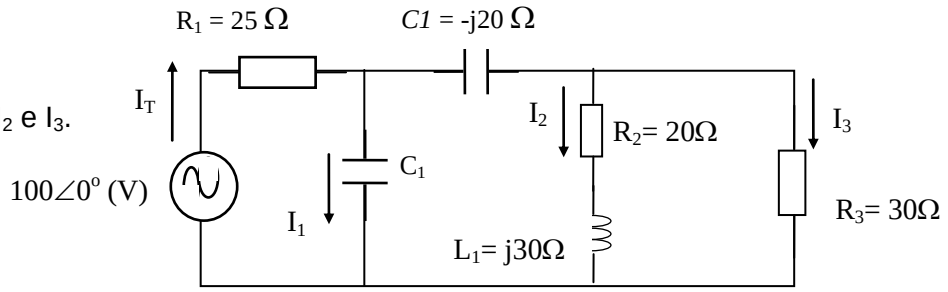
9. Dado o circuito abaixo determinar:

   a) Zeq
   b) As correntes: total $i_T(t)$ e $i_{R2}(t)$
   c) A tensão $v_1(t)$ e $v_2(t)$;



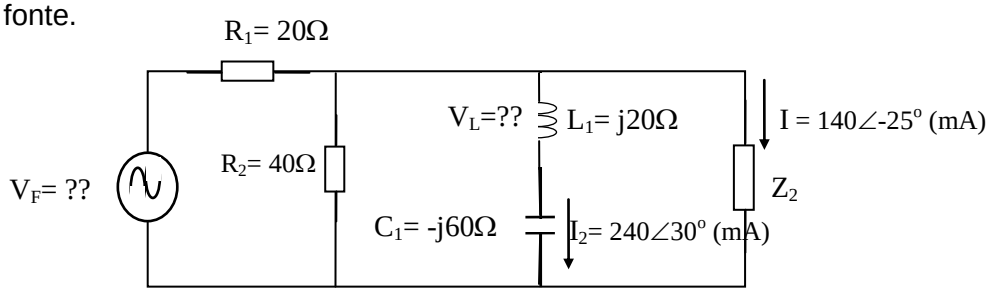
10. Dado o circuito abaixo determinar:

    a) Zeq
    b) A corrente total I_T;
    c) b) As corrente I_1, I_2 e I_3.

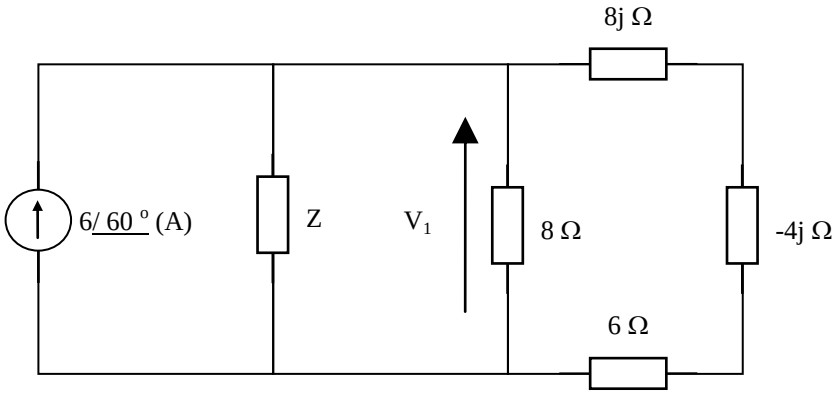


11. Dado o circuito abaixo determinar:

    a) A tensão V_L;
    b) O valor de Z_2; qual(is) o(s) elemento(s) de Z para ω = 3000rad/s
    c) A tensão da fonte.
    d) Zeq

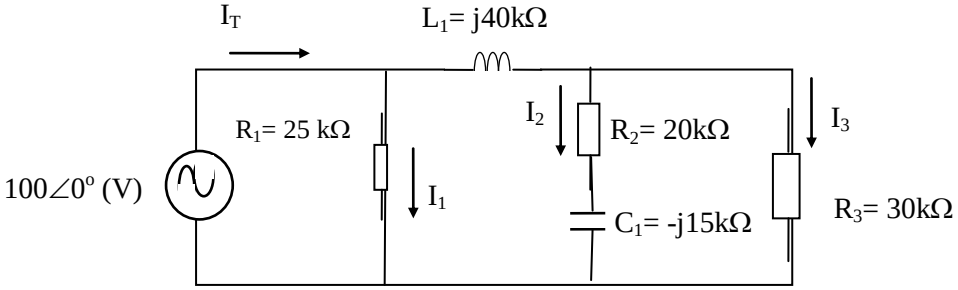


12. Dado o circuito, e sabendo que a tensão V1 é de 6 | 15,95° (V), a frequência é de 200 Hz. Calcule o valor da impedância Z. Determine o tipo de associação que corresponde à impedância Z (RL, RC, L, C ou R). Calcule o **valor numérico** do(s) componente(s) da associação equivalente à impedância Z.



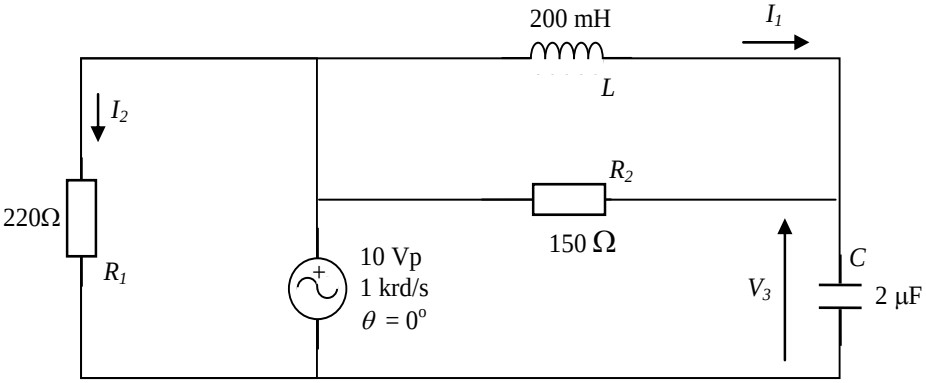
13. Dado o circuito abaixo determinar:

a) Determine Zeq
b) A corrente total I_T;
c) As corrente I_1, I_2 e I_3.



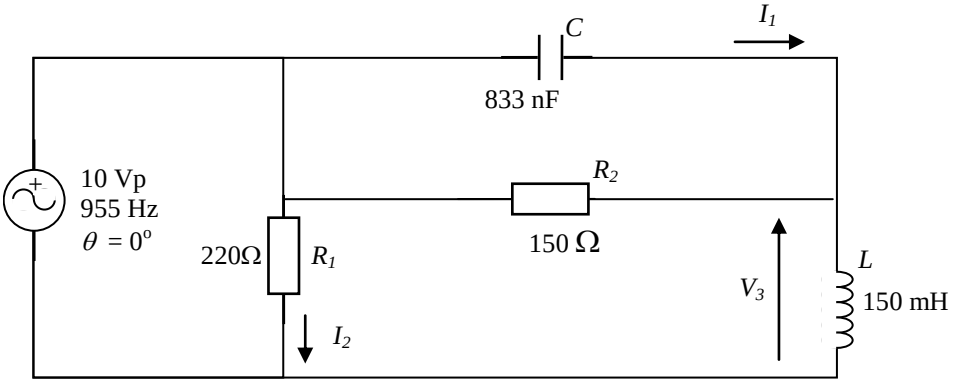
14. Dados os circuitos abaixo determine:

a) I_1
b) I_2
c) V_3
d) Zeq



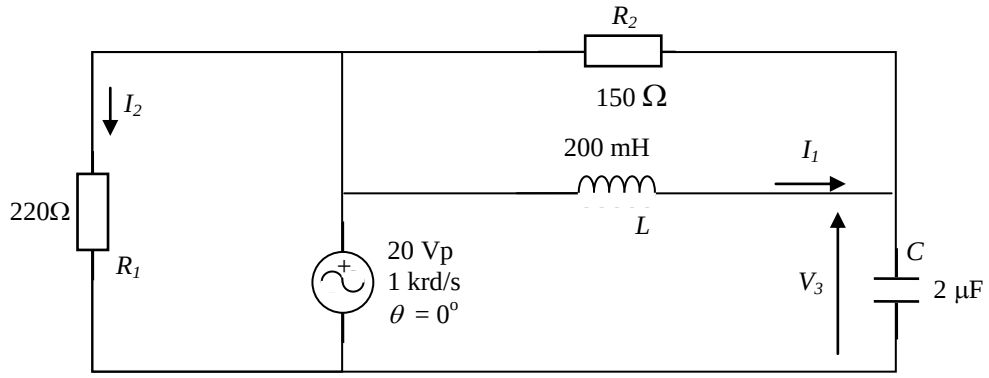
15. Dados os circuitos abaixo:

a) I_1
b) I_2
c) V_3
d) Zeq

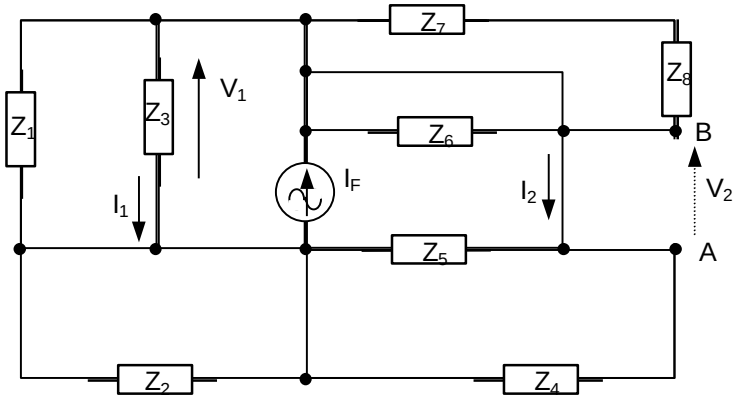


16. Dados os circuitos abaixo:

a) I_1
b) I_2
c) V_3
d) Zeq

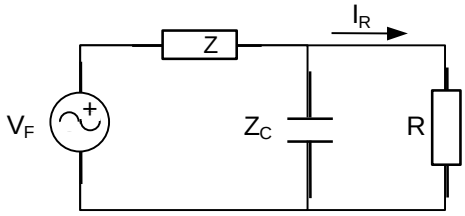


17. Dado o circuito abaixo determine as ***correntes*** e as ***tensões*** indicadas no esquema.

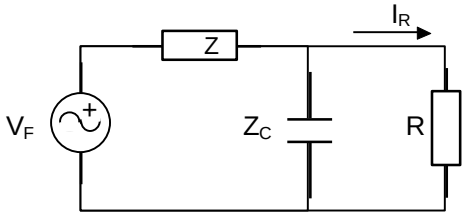


$I_F = 10 \angle 60^o$ A
$Z_1 = -2j\Omega$
$Z_2 = 4\ \Omega$
$Z_3 = 100kj\ \Omega$
$Z_4 = 22j\Omega$
$Z_5 = -22{,}5j\Omega$
$Z_6 = 3j\Omega$
$Z_7 = 2kj\Omega$
$Z_8 = 2\ \Omega$

18. Para os circuitos abaixo, determine o valor da **impedância Z** que irá produzir as tensões e correntes indicadas no circuito.
    a) Determine o *tipo de associação* (RC, RL, R, C ou L)
    b) Calcule o *valor dos componentes* (R ou L ou C) que a compõe.



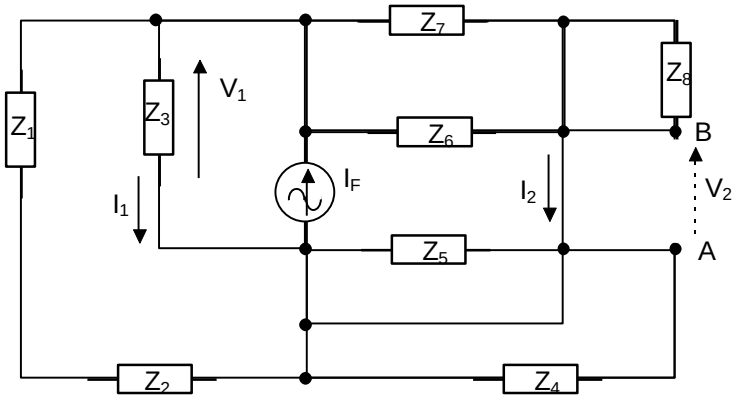
$I_R = 2 \angle 115^o$ A
$Z_C = -10kj\ \Omega$
$R = 5\Omega$
$V_F = 30 \angle 115^o$ V
w = 10 krd/s



$I_R = 1 \angle 25^o$ mA
$Z_C = -5j\ \Omega$
$R = 10k\Omega$
$V_F = 15 \angle 37^o$ V
w = 1 krd/s

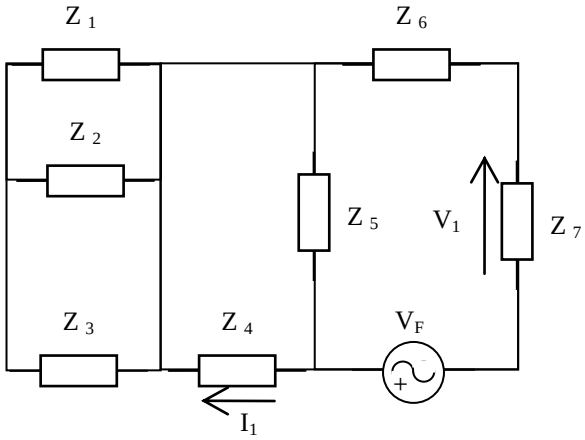
19. Para cada impedância dada abaixo calcule o *valor dos componentes* (R ou L ou C) que a compõe.
    a) $7{,}5 \angle -27^o\ \Omega$ — w = 7,5 krd/s
    b) $(-65j + 150)\ \Omega$ — f = 20 kHz
    c) $25 \angle 90^o\ \Omega$ — w = 1,0 krd/s
    d) $(150 - 65j)\ \Omega$ — f = 20 kHz
    e) $25 \angle 0^o\ \Omega$ — w = 1,0 krd/s
    f) $7{,}5 \angle +69^o\ \Omega$ — w = 7,5 krd/s

20. Dado o circuito abaixo determine as ***correntes*** e as ***tensões*** indicadas no esquema.



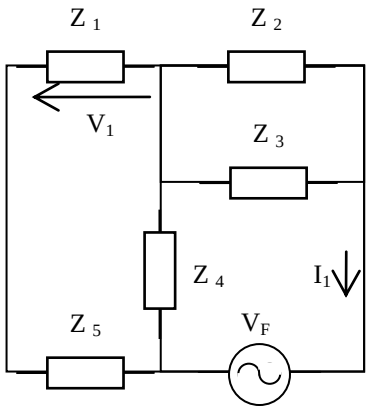
$I_F = 4 \angle +23{,}13^o$ A
$Z_1 = -3j\Omega$
$Z_2 = 4\ \Omega$
$Z_3 = 100kj\ \Omega$
$Z_4 = 22j\Omega$
$Z_5 = -22j\Omega$
$Z_6 = 3j\Omega$
$Z_7 = 20kj\Omega$
$Z_8 = 2\ \Omega$

21. No circuito abaixo, determine o valor da *Corrente I_1* e da *Tensão V_1*. Depois calcule o *valor numérico do fasor tensão V_1 e da tensão $v_1(t)$.* A frequência da fonte é de 100 rd/s.



Dados:
$Z_1 = 5\ \Omega$
$Z_2 = -10j\ \Omega$
$Z_3 = 5j\ \Omega$
$Z_4 = 2j\ \Omega$
$Z_5 = 2\ \Omega$
$Z_6 = 4\ \Omega$
$Z_7 = -j\ \Omega$
$V_F = 5\underline{/\ 10^o}$ [V]

22. No circuito abaixo, determine o valor da *Corrente I_1* e da *Tensão V_1* .



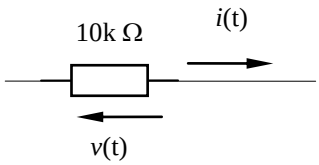
Dados:

$Z_1 = Z_5 = 50\ \Omega$
$Z_2 = Z_3 = -6j\ \Omega$
$Z_4 = 1j\ \Omega$
$V_F = 4\ \underline{/\ 30^o}$ [V]

ANÁLISE DE CIRCUITOS II Prof. : Alexandre Moreira
Aluno:.....

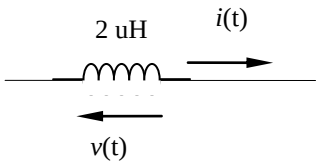
Lista de Exercícios 4 – Fasores – Reatância Indutiva – Reatância Capacitiva - Impedância

1. Nos componentes abaixo calcule o que é pedido:



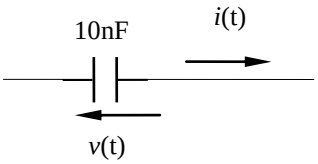
v(t) = ?

i(t) = sin (200t) mA



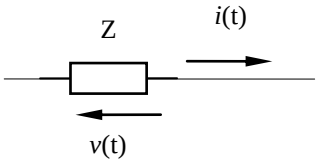
v(t) = ?

i(t) = 250 sin(450t -10^o)mA



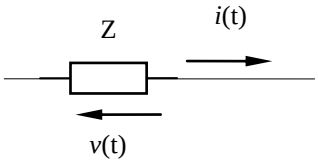
v(t) = ?

i(t) = 100 mA, 60Hz, e considere a fase = 0^o



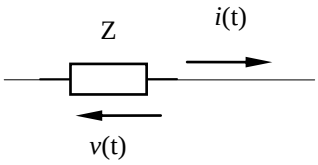
v(t) = 20 sin(200t +30^o)V

i(t) = 100 sin (200t - 60^o) mA



v(t) = 12 sin(1000t)V

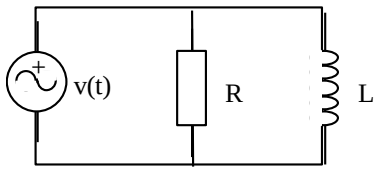
i(t) = 3sin (1000t - 40^o) A



v(t) = 6.5 sin(1500t +30^o)V

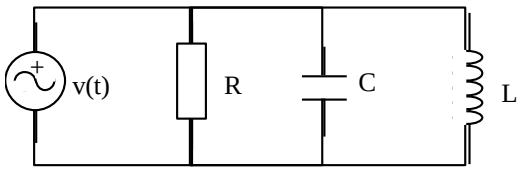
i(t) = 3 sin (100t - 60^o) mA

2. Transforme o circuito abaixo para o domínio da freqüência, acha a impedância equivalente e calcule as tensões e correntes no resistor e indutor.



v(t) = 20 sin (500kt) [V]
R = 2 Ω
L = 10 μH

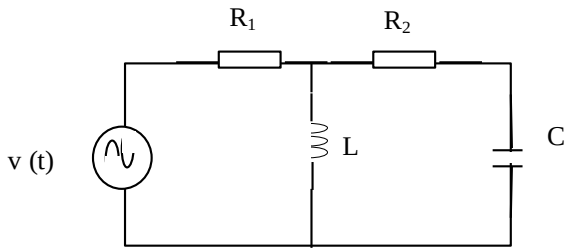
3. Transforme o circuito abaixo para o domínio da freqüência, acha a impedância equivalente e calcule as tensões e correntes no resistor e indutor.



v(t) = 1 sin (1k π t) [V]
R = 220 Ω
C = 3,3 μF
L = 15 mH

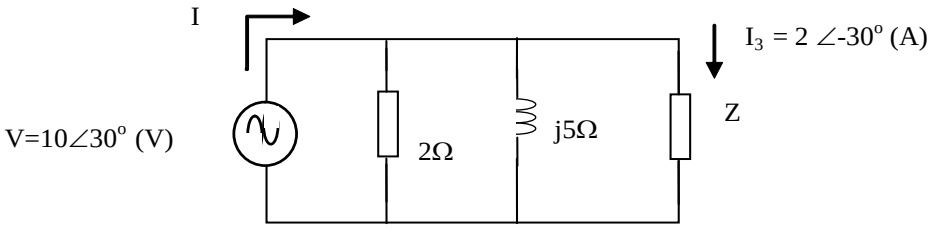
4. Altere a tensão da fonte do circuito RLC paralelo para v(t) = 10 sin (1431 π t) [V] e recalcule todos os valores.

5. Dado o circuito abaixo, determinar:
   a) a corrente fornecida pela fonte; b) a tensão sobre R_2

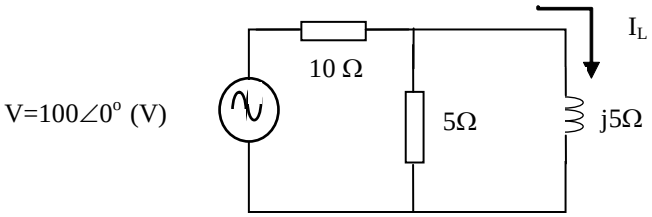


v(t)= 100 sen (3000t + 60°)(V)
R_1= 2 Ω
R_2= 1 Ω
L = 1 mH
C= 20 μF

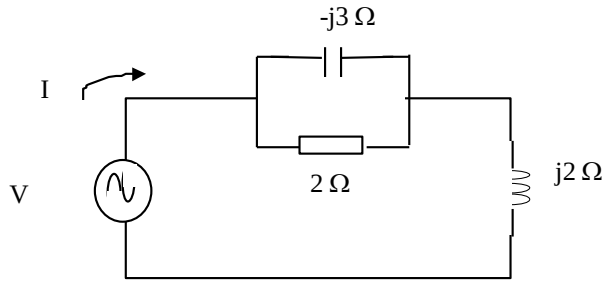
6. Para o circuito abaixo determinar a impedância Z e a corrente da fonte (I):



7. Encontrar a corrente no indutor (I_L) para o circuito

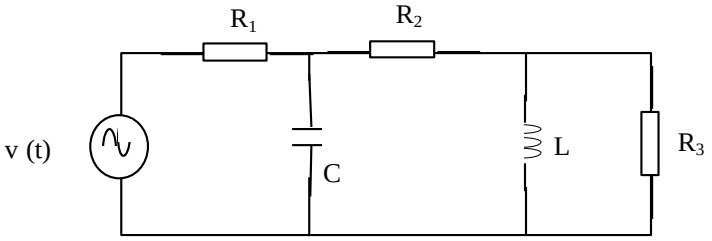


8. Dado o circuito abaixo qual o valor da tensão da fonte (V), supondo que circule uma corrente total de 20∠30o A.



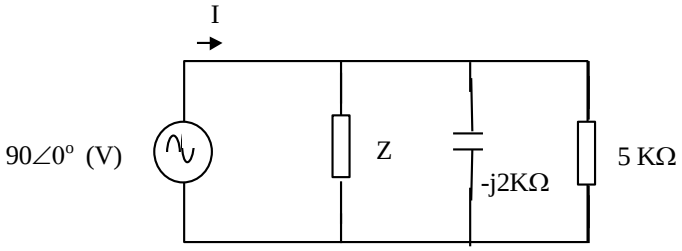
9. Dado o circuito abaixo, determinar:

a) A corrente total no circuito; b) A tensão sobre cada elemento

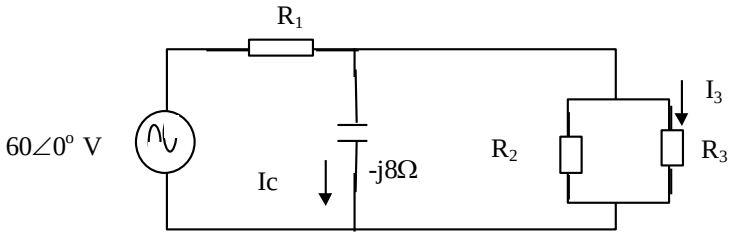


v(t) = 100 sen (20000 t) (V)
R1= 2 Ω R2= 1 Ω
L= 0,30 mH C= 5 μF
R3= 5 Ω

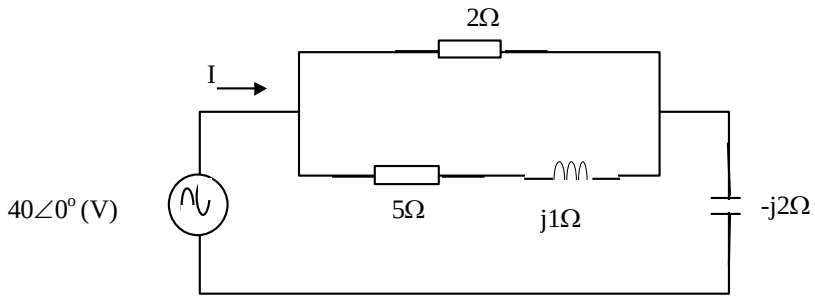
10. Para o circuito abaixo determinar a impedância Z , sabendo que I = 45 ∠- 60^o Ma



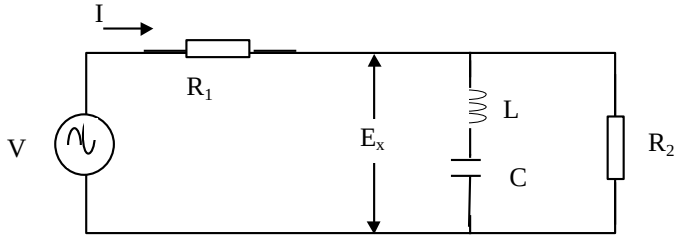
11. No circuito abaixo encontrar as correntes Ic e I3, sabendo que R1= R2 = 10 Ω e R3= 20 Ω



12. Encontrar a corrente total no circuito abaixo

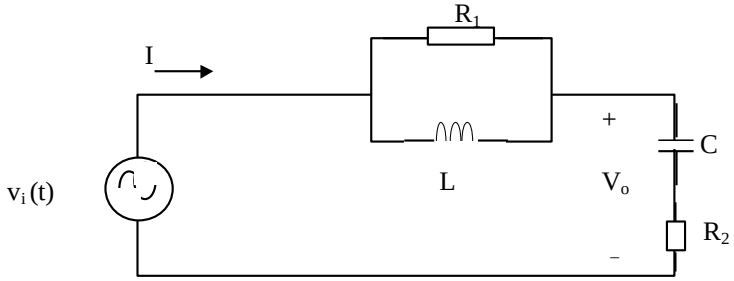


13. Determinar, no circuito abaixo, a tensão Ex:



V= 60 V (159 Hz)
R1= 20 Ω R2= 60 Ω
L= 1H C= 1 μ F

14. Determinar a tensão Vo e a corrente total para o seguinte circuito:



vi(t)= 100 sen (1000 t) (V)
R1= R2 = 100Ω
L= 1 H C= 1 μF

15. Achar o valor da impedância Z no circuito abaixo, sabendo-se que V = 50 ∠30° (V) e I = 27,9 ∠57,8° (A).