Redes Transmissão - Turma
Carla Beatriz da Silva Teixeira

(1º) a) Vin — R — Vout, C1

↳ $H(w) = \frac{Z_{C1}}{R1 + Z_{C1}} = \frac{1}{1 + jwR1C1}$

b) Vin — R1 — Vout, L1

↝ $H(w) = \frac{Z_{L1}}{R1 + Z_{L1}} = \frac{jwL1}{R1 + jwL1}$

c) Vin — L2 — Vout, R2

↝ $H(w) = \frac{R2}{R2 + Z_{L2}} = \frac{R2}{R2 + jwL2}$

d) Vin — C2 — Vout

↝ $H(w) = \frac{R2}{R2 + Z_{C2}} = \frac{jwR2C2}{1 + jwC2R2}$

(2º) a) $wc = \frac{1}{R1C1} \rightarrow fc = \frac{wc}{2\pi} = \frac{1}{2\pi R1C1} = \frac{1}{2\pi \cdot 35 \cdot 420 \cdot 10^{-9}}$

$= \boxed{10,82\,KHz}$

b) $wc = \frac{1}{\frac{L1}{R1}} = \frac{R1}{L1} \rightarrow fc = \frac{wc}{2\pi} = \frac{R1}{2\pi \cdot L1} = \frac{35}{2\pi \cdot 280 \cdot 10^{-6}}$

$= \boxed{19,89KHz}$

c) $wc = \frac{1}{\frac{L2}{R2}} = \frac{R2}{L2} = fc = \frac{wc}{2\pi} = \frac{R2}{2\pi L2} =$

$\frac{1000}{2\pi \cdot 500 \cdot 10^{-6}} \rightarrow = \boxed{318,30\,KHz}$

d) $wc = \frac{1}{R2C2} = fc = \frac{wc}{2\pi} = \frac{1}{2\pi R2C2} = \frac{1}{2\pi \cdot 10^3 \cdot 10^{-12}}$

$= \boxed{15,91\,MHz}$

3º) $Atx = 20\log(G) = Atx = 20\log\left(\frac{1}{100}\right) = -40\,dB$

$Ef = \log(f2) - \log(f1) = \log(10.000) - \log(10) =$

$4 - 1 = \boxed{3\,dec}$

$Atf = \frac{Atx}{Ef} = \frac{-40}{3} = \boxed{-13,333\,dB/dec}$

∴ utilizando o filtro:

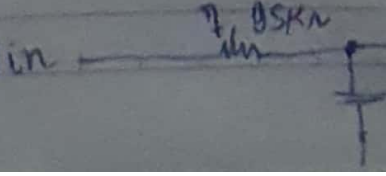
$Atf = -20\,dB/dec$

$n = \frac{Atx}{Atf} \rightarrow n = \frac{-40}{-20} = 2$

$fc = \frac{fx}{10^n} \rightarrow fc = \frac{10K}{10^2} \rightarrow fc = 100\,Hz$

∴ Resistência: $R = \frac{1}{2\pi \cdot 100 \cdot 200 \cdot 10^{-9}} \rightarrow \boxed{7,95K\Omega}$

Desenho do circuito:



* Filtro Passa baixa

4º) $Atx = 20 \log(G) \Rightarrow Atx = 20 \log\left(\frac{1}{800}\right) = \boxed{-58,06\ dB}$

$Ef = \log(f2) - \log(f1) = \log(1000) - \log(60) =$

$Ef = 3 - 1,78 \Rightarrow \boxed{Ef = 1,22\ dec}$

$Atf = \frac{Atx}{Ef} \Rightarrow \frac{-58,06}{1,22} = -47,59\ dB/dec$

∴ utilizando o filtro:

$Atf = -60dB/dec$

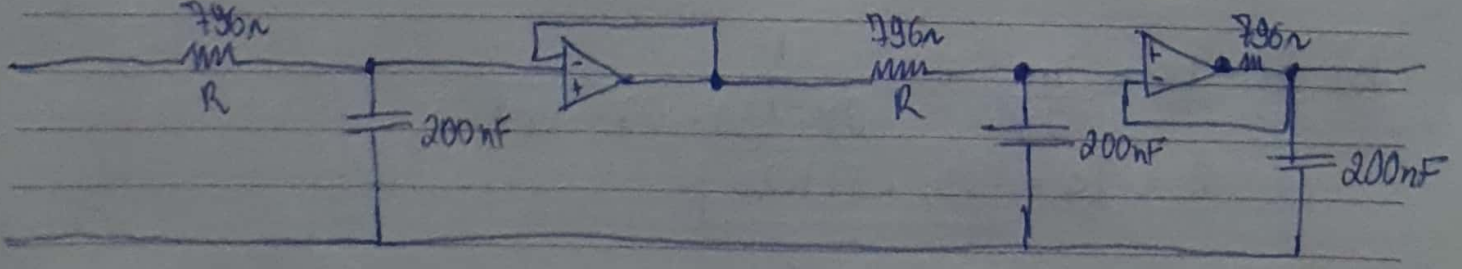
$n = \frac{Atx}{Atf} \Rightarrow n = \frac{-58,06}{-60} \Rightarrow \boxed{n = 0,968}$

$fc = \frac{fx}{10^n} \Rightarrow fc = \frac{60K}{10^{0,968}} \Rightarrow \boxed{fc = 6,458\ KHz}$

∴ utilizando o capacitor de 200nF, calcule o resistor:

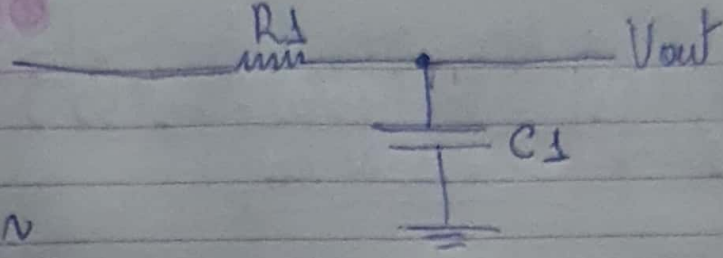
$R = \frac{1}{2\pi \cdot fc \cdot C} \Rightarrow \frac{1}{2\pi \cdot 10^3 \cdot 200 \cdot 10^{-9}} \Rightarrow = \boxed{796\Omega}$

Desenho do circuito:



Tipo: Filtro Passa Baixa

5º



* Dados:
R1 = 100 Ω
C1 = 100nF

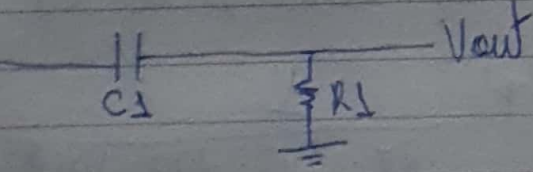
a) Filtro Passa Baixa

b) $R = f_c = \frac{1}{2\pi C} \rightarrow \frac{1}{2\pi \cdot 100 \cdot 100 \cdot 10^{-9}}$

$R = f_c = 15,915\ KHz$

c) Simulação no Proteus
→ filtro passa baixa
→ corte: 15,8 KHz / -3dB

6º



* Dados:
C1 = 27nF
R1 = 150 Ω

a) Filtro Passa Alta

b) $R = f_c = \frac{1}{2\pi \cdot 150 \cdot 27 \cdot 10^{-9}}$

$R = f_c = 39,297\ KHz$

c) Simulação no Proteus
→ filtro passa alta
→ corte: 39,2 KHz a -3,2 dB/dec