

Análise de sinais I - Fieqa 4

4) $x(t) = \overset{\downarrow}{0,7} + 0,6 \cos(400\pi t) + 0,5 \cos(800\pi t) + 0,4 \cos(1600\pi t) + 0,3 \cos(2000\pi t) + 0,2 \cos(2800\pi t)$

a1) sinal periódico com componente constante de 0,7 volts.
Verdadeiro

B2) Período $\rightarrow 5 \text{ ms}$ e componente constante $\rightarrow 0,35$
 \downarrow \downarrow
 $\frac{1}{200} = 5 \times 10^{-3} \text{ seg}$ $\text{mal } x$
 $200 = 5 \text{ ms} \checkmark$

c3) frequência fundamental de 400 Hertz.
 \downarrow

$$400/2 = 200 \text{ Hertz}$$

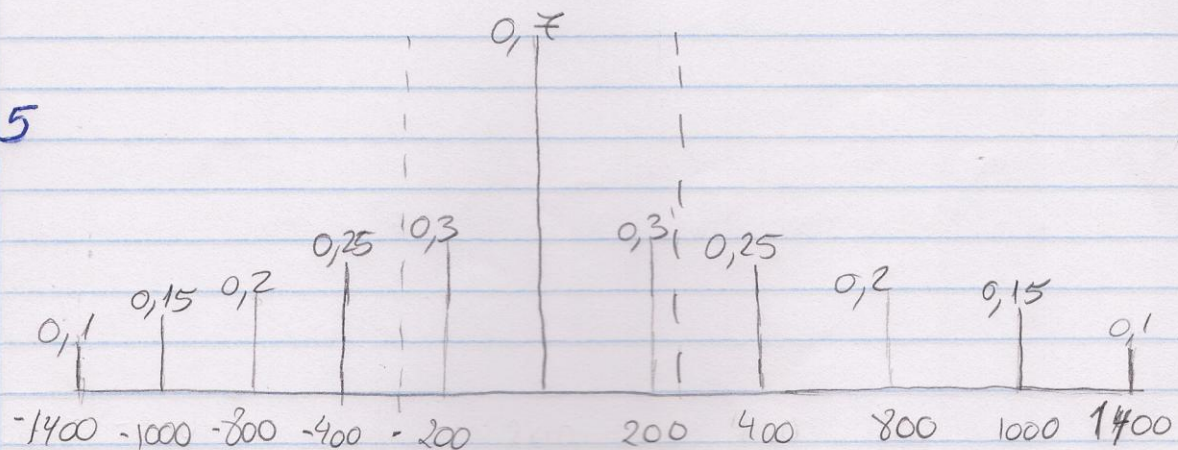
Falso

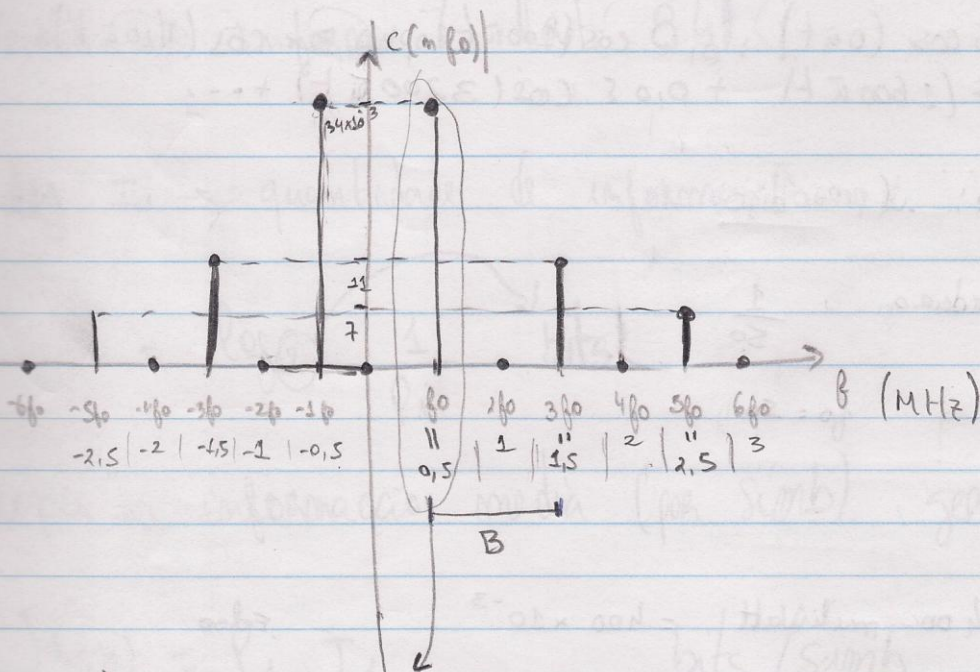
D4) Período de 2,5 ms

$$\downarrow$$

$$\frac{1}{200} = 5 \text{ ms}$$

5



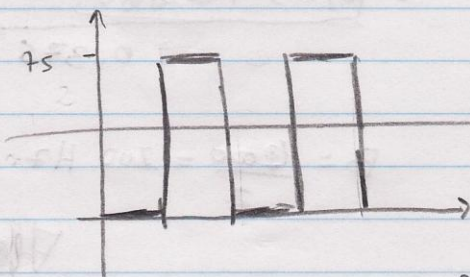


$$(34 \times 10^{-3}) \times 2 \times \cos(2\pi \cdot 0.5 \times 10^6 t)$$

b) (pág 41 Sabemta)

$S = ?$

$$S = \frac{1}{T_0} \int_{T_0} |V(t)|^2 dt$$



$$S = \frac{(75 \text{ mV})^2}{2} \approx 28,1 \times 10^{-4} \text{ Watts}$$

$$(90\% \times 28,1 \times 10^{-4}) \approx 25,2 \times 10^{-4}$$

$$S = \sum_{-\infty}^{\infty} |C_n|^2 = |C_0|^2 + 2|C_1|^2 + 2|C_2|^2 + \dots$$

$$= 2 \cdot (34 \times 10^{-3})^2 + 0 + 2 \cdot (11 \times 10^{-3})^2$$

$$= 2,312 \times 10^{-3} + 0 + 2,4 \times 10^{-3}$$

$$= 2,6 \times 10^{-3} \quad \checkmark$$

$$B = 1 \text{ MHz}$$

Fila exercícios (Análise sinais 2)

2.1.a)

$$= 75 \times 10^{-3}$$

$$R_b = 2 \text{ Mbps}$$

$$|C_{\text{par}}| = \left| \frac{A\sqrt{2}}{2^n \text{ par}} [\cos(\pi \text{ par}) - 1] \right|$$

$$C_m = \begin{cases} 0 & \text{se } m=0 \\ \left| \frac{A\sqrt{2}}{2^n \cdot m} \right| & \text{se } m=\text{impar} \\ 0 & \text{se } m=\text{par} \end{cases}$$

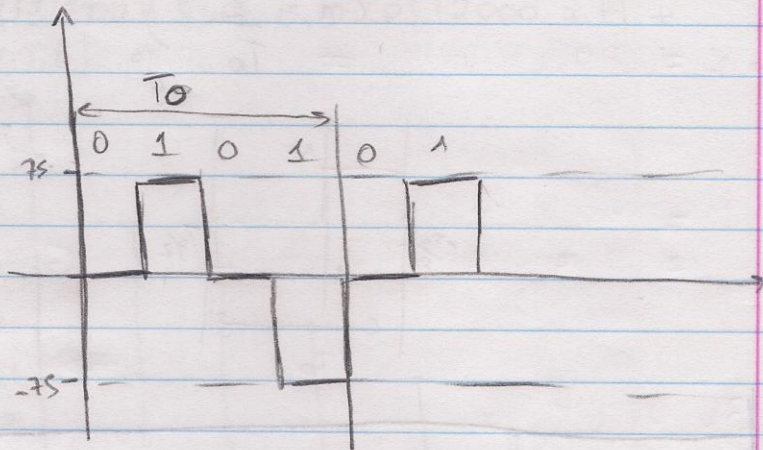
$$C_0 = 0$$

$$C_{-1} \approx 34 \times 10^{-3}$$

$$C_{-2} = 0$$

$$C_{-3} \approx 11 \times 10^{-3}$$

$$C_{-4} = 0$$



$$2 \times 10^6 \text{ ——— } 1 \text{ s}$$

$$1 \text{ ——— } n$$

$$n = \frac{1}{2 \times 10^6}$$

$$T_0 = \frac{4}{2 \times 10^6}$$

$$f_0 = \frac{1}{\frac{4}{2 \times 10^6}} = \frac{2 \times 10^6}{4} = 5 \times 10^5 \text{ Hz}$$

$$\Downarrow$$

$$0,5 \text{ MHz}$$

$$3.2. v(t) = 0,5 \cos(0\pi t) + 0,4 \cos(100\pi t) + 0,3 \times \cos(400\pi t) + 0,2 \cos(1600\pi t) + 0,05 \cos(3200\pi t) + \dots$$

A.1. Falso (periódico)

B.2. Verdadeiro $\frac{1}{50}$

C.3. Falso $f_0 = 50$

D.4. $S = 400 \text{ mW} = 400 \times 10^{-3}$ Falso

$$90\% \times 400 \times 10^{-3} = 0,36$$

$$S = |c_0|^2 + 2 \cdot |c_1|^2$$

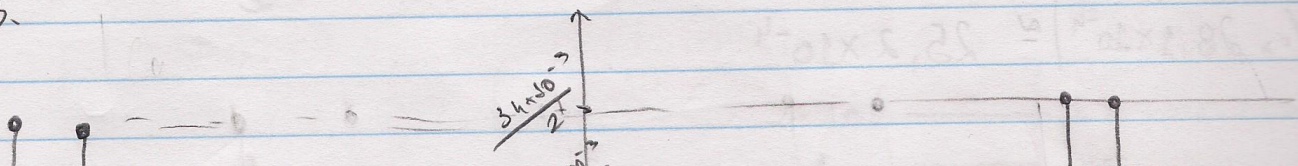
$$= 0,25 + 2 \times (0,2)^2 + 0,045$$

$$= 0,375$$

$$B = \frac{400}{2} = 200 \text{ Hz}$$

Verdadeiro

3.

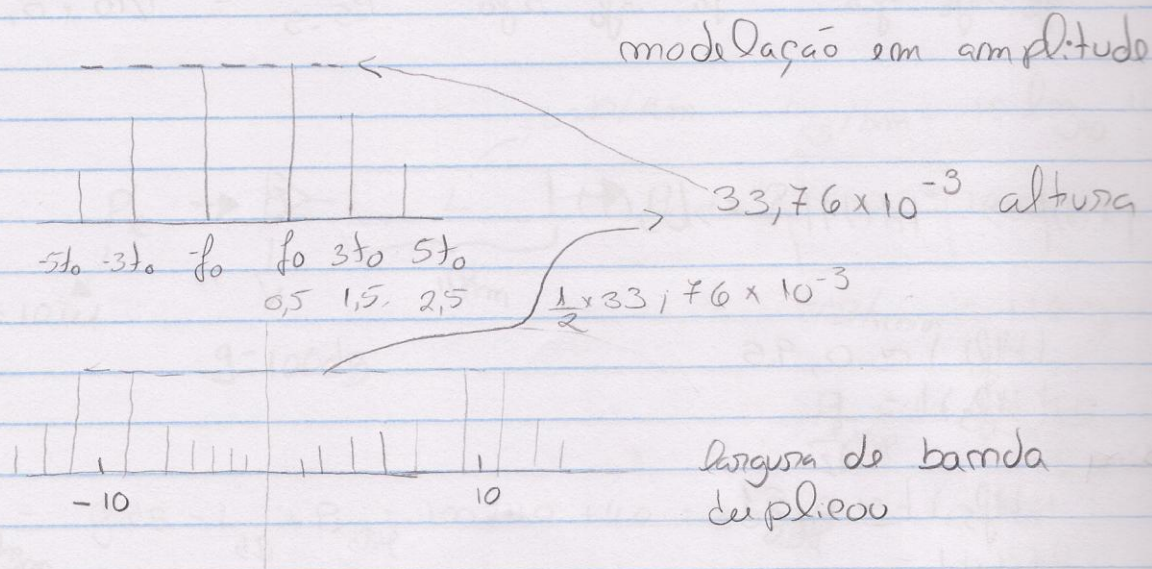
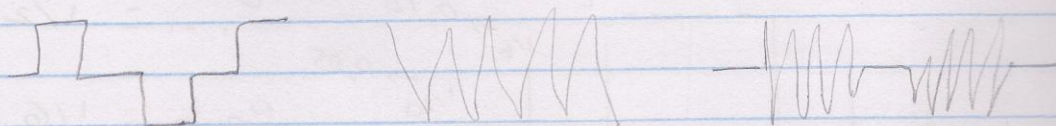


26/11/2010

Análise de sinais

4) $H(f) = \frac{1}{1 + j \frac{f}{B_T}}$

$Z(t) = v(t) \cdot \cos(2\pi f_p t)$



Sistema de Transmissão

1) $H(f) = \frac{1}{1 + j \frac{f}{B_T}}$

$|H(f)| = \left| \frac{1}{1 + j \frac{f}{B_T}} \right| = \frac{1}{\sqrt{1^2 + \left(\frac{f}{B_T}\right)^2}}$

$|H(f)|^2 = \left| \frac{1}{1 + j \frac{f}{B_T}} \right|^2 = \frac{1}{1 + \left(\frac{f}{B_T}\right)^2}$

