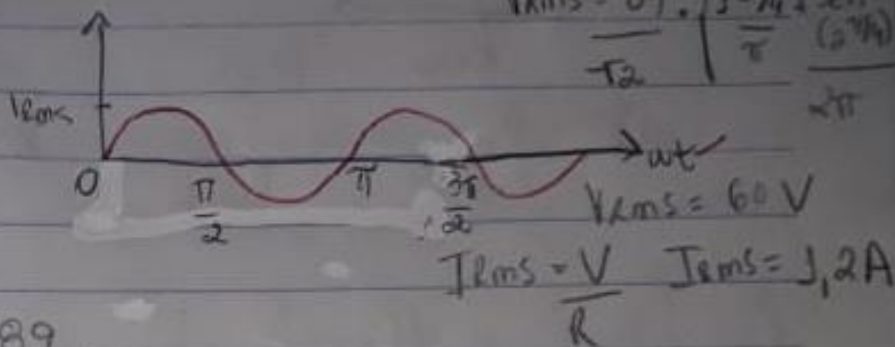
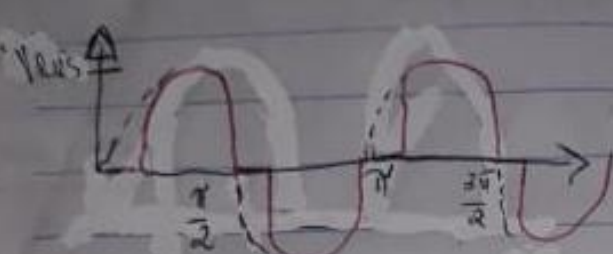


L4

Nome: André Luiz N. Carneiro de Castro 92854

a) Fazer a tensão e corrente na carga. Disparo  $45^\circ$ .



$$2:1 \quad \frac{180}{2} \quad 90 - 45 = 45 \quad V = 89$$

b) A tensão média e eficaz na carga p/  $45^\circ, 120^\circ$ .

A tensão média produzida na carga pelos conversores CA-CA é sempre nula.  $V_{medio} = 0V$

$$V_s = 89$$

$$[45^\circ] \quad V_{rms \text{ carga}} = V_s \sqrt{\frac{1 - \frac{\alpha}{2\pi} + \frac{\sin(2\alpha)}{4\pi}}$$

$$89 \sqrt{\frac{1 - \frac{45}{2\pi} + \frac{\sin(90)}{4\pi}} = V_{rms \text{ carga}} = 60^\circ$$

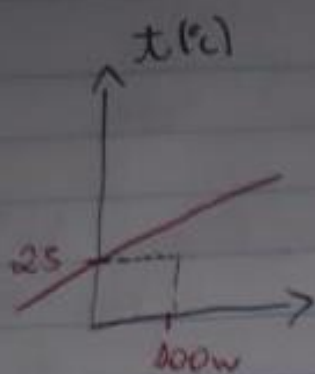
$$[120^\circ] \quad V_{rms} = 89 \sqrt{\frac{1 - \frac{120}{2\pi} + \frac{\sin(240)}{4\pi}} \quad \frac{180 \cdot 4}{3}$$

$$V_{rms} = 27.82^\circ$$

$$c) \quad Pot [45^\circ] = \frac{60^2}{50} \Rightarrow 72 \text{ W}$$

$$Pot [120^\circ] = \frac{27.82^2}{50} \Rightarrow 15.47 \text{ W}$$

2.



Interpolando LINEAR  
 $(y = ax + b)$

$$a = \frac{0 - 25}{100 - 0} = -0,25$$

$$x = -0,25 \cdot P + 25$$

$$10t = P + 250$$

$$10t - 250 = P$$

$$P = \frac{(V_{rms})^2}{R}$$

$$V_{rms} = \sqrt{P \cdot R}$$

a)  $V_{out\_rms} = V_s \sqrt{\frac{N}{N+m}}$

$$K = \left( \frac{N}{N+m} \right)$$

b)  $V_{out\_rms} = V_{fmax} \left[ \frac{1 - \alpha + \frac{\sin(2\alpha)}{2\pi}}{2} \right]$

$$P = (10 \cdot 60 - 250) \Rightarrow P = 350W$$

$$V_{rms} = \sqrt{350 \cdot 10}$$

$$V_{rms} = 59.16V$$

$$V_{out\_rms} = V_s \left[ \frac{1 - \alpha + \frac{\sin(2\alpha)}{2\pi}}{\pi} \right]^{1/2}$$

$$59.16 = 127 \cdot \left[ \frac{1 - \alpha + \frac{\sin(2\alpha)}{2\pi}}{\pi} \right]^{1/2}$$

$$2.46 = 1 - \alpha + 0.5 \sin(2\alpha)$$

$$\alpha = 2.051 \text{ rad}$$

$$\alpha = 117.5^\circ$$

a.  $V_{out\_rms} = V_s \sqrt{K}$

$$K = \left( \frac{59.16}{127} \right)^2$$

$$K = 0.217$$

$$K = 21.7\%$$

$$4. \quad \sqrt{5 \frac{n}{m+n}} \quad m = 75 \quad n = 125$$

$$127 \cdot \sqrt{\frac{125}{75 + 125}} = 100.4 \text{ V}$$

$$3. \quad a = \pi/3 \quad R = 10 \Omega \quad V = 380 \text{ V}, 60 \text{ Hz} \quad 380/\sqrt{3} = 220$$

$$\sqrt{6} \cdot 220 \left[ \frac{1}{\pi} \left( \frac{1}{12} + 3 \frac{\sin(2 \cdot 60)}{16} + \frac{\sqrt{3} \cdot 105 \sin(2 \cdot 60)}{16} \right) \right]^{0.5}$$

$$538.8 \left[ \frac{1}{\pi} (0.2617 + 0.1823 + (-0.0541)) \right]^{0.5}$$

$$538.8 [0.1177]^{0.5}$$

$$184.47 \text{ V}$$

$$6. a) \quad 184.47 \text{ V}$$

$$b) \quad \text{Pot}[60^\circ] = \frac{184.47^2}{10} = 3402 \text{ W}$$

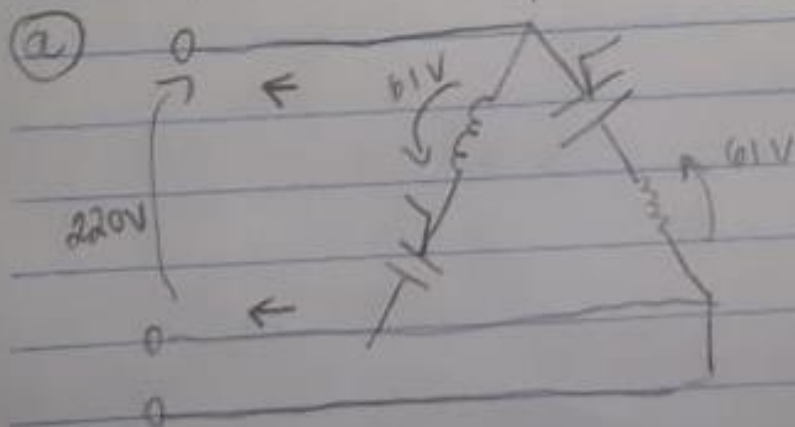
$$5) \quad P_{3\phi} = 7.46 \text{ W} \quad Z = 3150^\circ \Omega = 63$$

$$\omega = 3800 \text{ rpm}$$

$$V_L = 220 \text{ V}$$

$$b) \quad P_{3\phi} = \left( \frac{P_{3\phi}}{3} \right) = 2486.66 \text{ W}$$

$$P_{3\phi} = \frac{|V_{rms}|^2}{|Z|}$$



$$P_{design} = 50\% P_{max}$$

$$P_{design} = 1243.33 \text{ W}$$

$$V_{rms \text{ design}} = \sqrt{1243.33 \times 3}$$

$$V_{rms \text{ design}} = 61.07 \text{ V}$$

$$Z = 2.0 \text{ rad} \quad Z = 11459$$

$$\omega = 14,736 \text{ Vrms}$$

$$\omega = 900 \text{ rpm}$$

$$7a) \quad P = \frac{V_{RMS}^2}{R} \rightarrow 7,5k = \frac{V_{RMS}^2}{1,5} \quad V_{RMS} = 106,06 \text{ V}$$

$$V_{RMS} = 127 \sqrt{\frac{1-\alpha}{\pi} + \frac{\sin(2\alpha)}{2\pi}} \rightarrow 106,06^2 = \left(127 \sqrt{\frac{1-\alpha}{\pi} + \frac{\sin(2\alpha)}{2\pi}}\right)^2$$

$$\frac{11250}{127^2} = \frac{1-\alpha}{\pi} + \frac{\sin(2\alpha)}{2\pi} \rightarrow 0,9503 = 2 - 0,5\sin(2\alpha)$$

$$\boxed{\alpha = 1,25 \text{ Rad}, 71,62^\circ}$$

b) = JA encontra anteriormente  
 $V_{RMS} = 106,06 \text{ V}$