03)

a) $n_s = \frac{120.f}{p} = \frac{120.60}{6} = 1200\ RPm$

b) $s = \frac{ns - nR}{ns} = \frac{1200 - 1140}{1200} = 0,0500$

c) O carregamento será de 100%, pois está trabalhando a plena carga.

$Carreg = \frac{10,0000}{10,0000} \times 100 = 100,0000\%$

d) $\sigma_0 = \frac{7350}{1140 . \frac{2\pi}{60}}$

$\sigma_0 = 61,5678\ Nm$

e)

$NR = 1198\ RPm$ → Adotado

$s = \frac{NS - NR}{NS} = \frac{1200 - 1198}{1200} = 0,0017$

$s = 0,0500$

04) a)

$NS = \frac{120.F}{p} = \frac{120.50}{8} = 750\ RPm$

$NR = (1 - s).NS$

$NR = (1 - 0,0500).750$

$NR \simeq 712,5000\ RPm$ //

b)

$P_{CUR} = 5 . P_g$

$P_{MD} = (1 - s) . P_g$

$7660 = 0,9500 . P_g$

$P_g = 8063,1579 W$

$P_o = P_{MD} - P_{ROT}$

$7460 = P_{MD} - 200$

$P_{MD} = 7660 W$

* $P_{CUR} = 0,0500 . 8063,1579$

$P_{CUR} = 403,1579 W$ //

c)

$$\sigma_o = \frac{7460}{712,5000 . \frac{2\pi}{60}}$$

$\sigma_o = 99,9828 Nm$

d)

$f_{roton} = s . f_{estator}$

$f_{roton} = 0,0500 . 50$

$f_{roton} = 2,5000 HZ$ //

05) a)

$P_{in} = \sqrt{3} . V_L . I_L . \cos\phi$

$$I_L = \frac{P_{in}}{\sqrt{3} . V_L . \cos\phi}$$

* Encontrando a potência de entrada

$$\eta\% = \frac{P_o}{P_{in}} \times 100$$

$$0,9125 = \frac{74600}{P_{in}}$$

$P_{in} . 0,9125 = 74600$

$$P_{in} = \frac{74600}{0,9125} = 81753,4247 W$$

* Encontrando a corrente nominal do motor.

$$I_L = \frac{81753,4247}{\sqrt{3} . 380 . 0,87}$$

$I_L = 142,7718 A$ //

b)

$$N_S = \frac{120 . 60}{8}$$

$N_S = 900 RPm$

$N_R = (1 - s) . N_S$

$N_R = (1 - 0,0300) . 900$

$N_R = 873 RPm$ //

c) $\sigma_0 = \frac{74600}{873 \cdot \frac{2\pi}{60}}$

$\sigma_0 = 816,0109\ Nm$ //

d) $S_{partida} = \frac{900 - 0}{900} = 1$

$S_{nominal} = 0,0300$

* $f_{motor} = S_{partida} \cdot f_{estator}$
$f_{motor} = 1 \cdot 60$
$f_{motor} = 60\ Hz$

* $f_{motor} = S_{nominal} \cdot f_{estator}$
$f_{motor} = 0,0300 \cdot 60$
$f_{motor} = 1,8000\ Hz$

06)
c) $\sigma_p = 150 \cdot \left(\frac{220}{440}\right)^2$

$\sigma_p = 37,5000\ Nm$ //

07)
a) $\sigma_p = 250 \cdot \left(\frac{220}{380}\right)^2$

$\sigma_p = 83,7950\ Nm$

b) $500 = \frac{380}{Z_{IN}}$ hogo: $I = \frac{220}{0,76}$

$Z_{IN} = 0,76\ \Omega$ $I = 289,4337\ A$

06)
a) $\sigma_p = 150 \cdot \left(\frac{380}{440}\right)^2$

$\sigma_p = 111,8802\ Nm$

b) $\sigma_p = 2.110 \rightarrow 220\ N.m$

hogo:

$150 = \frac{V^2 \cdot 220}{440^2} \rightarrow V^2 = \frac{440^2 \cdot 220}{150} \rightarrow V^2 = 42592000$

$V = \sqrt{42592000} \rightarrow V = 532,8665\ V$

08) a) $N_S = \frac{120 \cdot 60}{2}$

$N_S = 3600 RPm$

hogo: $S_{Tmáx} = \frac{3600 - 3520}{3600}$

$S_{Tmáx} = 0,0222$

b) $S_{Tmáx} = \frac{R_{roton}}{X_{BL}} \rightarrow X_{BL} = \frac{R_{roton}}{S_{Tmáx}}$

$X_{BL} = \frac{0,3}{0,0222} \rightarrow J13,5135\ \Omega$ //

c) $f_{roton} = S \cdot f_{estator}$

$f_{roton} = 0,0222 \cdot 60$

$f_{roton} = 1,3333\ HZ$ //

d) $Z_{IN} = 0,3 + J13,5000\ \Omega$

$\rightarrow 13,5033 \angle 88,7270^\circ\ \Omega$

$\cos(88,7270^\circ) = 0,0222$

e) 08) $S_{nom} = \frac{3600 - 3420}{3600}$

$S_{nom} = 0,0500$

$X_2 = 0,0500 \cdot 13,5000 \rightarrow J0,6750\ \Omega$

hogo:

$Z_{IN} = 0,3 + J0,6750$

$\rightarrow 0,7387 \angle 66,0375^\circ$

$\cos(66,0375^\circ) = 0,4061$

09) a) $N_S = \frac{120 \cdot f}{P} = \frac{120 \cdot 50}{10}$

$N_S = 600\ RPm$

b) $S = \frac{600 - 550}{600} = 0,0833$

c) $S_{vazio} = \frac{600 - 559}{600} = 0,0683$

10)

$f_{rotor} = S \cdot f_{estator}$

$S = \frac{3}{60} = 0,0500$

$N_S = \frac{120 \cdot 60}{4} = 1800 \text{ RPm}$

logo:

$N_R = (1 - 0,0500) \cdot 1800$

$N_R = 1710 \text{ RPm}$ //