

Correction TD1

2°/

2-1

$$I_{2cc} = I_{2n}$$

$$S_N = U_{20} \cdot I_{2N} \Rightarrow I_{2N} = \frac{S}{U_{20}}$$

$$m = \frac{I_{1cc}}{I_{2cc}} \Rightarrow \boxed{I_{2cc} = \frac{I_{1cc}}{m}} \quad ?$$

$$\text{AN: } I_{2cc} = \frac{20}{2} = 10 \text{ A}$$

$$\underline{2-2} \quad R_S = \frac{P_{1cc}}{I_{2cc}^2} = \frac{100}{10^2} = 1 \Omega$$

$$\text{on calcule d'abord } \boxed{Z_S = \frac{m U_{1cc}}{I_{2cc}}}$$

$$\text{AN: } Z_S = \frac{2 \times 10}{10} = 2 \Omega$$

$$Z_S^2 = R_S^2 + X_S^2 \Rightarrow X_S = \sqrt{Z_S^2 - R_S^2} = \sqrt{2^2 - 1^2}$$

$$Z_S \quad \boxed{X_S = 1.73 \Omega} \Rightarrow L_S = \frac{X_S}{\omega} = \frac{1.73}{314}$$

$$\boxed{L_S = 5.516 \text{ mH}}$$

2-3

$$\Delta V_2 = R_S I_2 \cos \varphi_2 + X_S I_2 \sin \varphi_2 \quad ; \varphi_2 = \frac{\pi}{6}$$
$$\Delta V_2 = 1 \times 10 \times \cos\left(\frac{\pi}{6}\right) + 1.73 \cdot 10 \sin\left(\frac{\pi}{6}\right) = 19 \text{ V}$$

2-4

$$V_2 = V_{20} - \Delta V_2 =$$
$$V_{20} = m \times V_{1N}$$
$$V_{20} = 2 \times 80 = 160 \text{ V}$$
$$V_2 = 160 - 19 = 141 \text{ V}$$

2-5

$$\eta = P_2 / P_1$$

$$P_2 = V_2 I_2 \cos \varphi_2 = 141 \times 10 \times \cos \frac{\pi}{3}$$
$$P_2 = 1221 \text{ W}$$
$$P_1 = P_2 + P_{\text{pert}} P_S = P_2 + P_{10} + P_{1cc} = 1221 + 120 + 100 =$$
$$P_1 = 1441 \text{ W} \Rightarrow \eta = 1221 / 1441 = 84.7\%$$