A I., a) $\hat{m} = \bar{m}_1 = 11{,}196\,g$ CHT → normális eloszlás $\Delta m_1 = \frac{s_1}{\sqrt{N_1}} \cdot \underbrace{z_{0{,}025}}_{1{,}96} = 0{,}0204\,g$

$P[\hat{m} - \Delta m_1 < m < \hat{m} + \Delta m_1] = 1 - \varepsilon$

5

$P[11{,}176\,g < m < 11{,}216\,g] = 95\%$ 2

b) $\hat{m} = \bar{m}_2 = 11{,}125\,g$ CHT nem alk. → Student elo. $\Delta m_2 = \frac{s_2}{\sqrt{N_2}} \cdot \underbrace{t_{N_2-1,\,0{,}025}}_{2{,}261} = 0{,}0820\,g$

$P[\hat{m} - \Delta m_2 < m < \hat{m} + \Delta m_2] = 1 - \varepsilon$

$P[11{,}043\,g < m < 11{,}207\,g] = 95\%$ 2

c) Az a) esetben, mivel $N_1 >> 1$, CHT miatt a normális eloszlás alkalmazható, de a b) esetben sem a normális, sem a Student nem. 1

A II., $\varphi = 2\pi \frac{\tau}{T} = 1{,}4137$ (81°) 1 $P = U \cdot I \cos\varphi = 1{,}799\,W$ 1 $|Z| = \frac{U}{I} = 4600\,\Omega$ $Z = |Z|[\cos\varphi + j\sin\varphi]$

$= R + j\omega L \Rightarrow R = |Z|\cos\varphi = 719{,}6\,\Omega$, $L = \frac{|Z|\sin\varphi}{\omega} = 14{,}46\,H$ 1

$P = U \cdot I\cos\varphi \Rightarrow \frac{\Delta P}{P_{wc.}} = \frac{\Delta U}{U} + \frac{\Delta I}{I} + \frac{\Delta\cos\varphi}{\cos\varphi} = \frac{\Delta U}{U} + \frac{\Delta I}{I} + \underbrace{\mathrm{tg}\,\varphi\,\Delta\varphi}_{\approx 0{,}04} \cong 6\%$ 1

5

$\Delta\varphi = \varphi\left[\frac{\Delta\tau}{\tau} + h_0\right] = \varphi\left[\frac{1}{\tau \cdot f_0} + h_0\right] = 0{,}0642\,rad$ 1