6.23.)

Marca A	52	44	50	49	51	46	58	50	48
Marca B	50	51	48	53	55	55	60	56	56

A) IC 98 % ?

X → tiempo de vida de la pantalla LED marca A $\sim N(\mu_A, \tau_A)$

Y → tiempo de vida de la pantalla LED marca B $\sim N(\mu_B, \tau_B)$

- Calcularemos IC para $\mu_1 - \mu_2$
- Antes debemos calcular $\frac{\tau_A^2}{\tau_B^2}$

→ Formulario 1 (c): $IC\left(\frac{\tau_A^2}{\tau_B^2}\right)\left[\frac{S_{cx}^2}{S_{cy}^2} F_{n-1,m-1,1-\alpha/2}, \frac{S_{cx}^2}{S_{cy}^2} F_{n-1,m-1,\alpha/2}\right]$

→ $1-\alpha = 0{,}98 \Rightarrow \frac{\alpha}{2} = 0.01$

→ $n = 9$; $\bar{y} = \frac{\sum y_i}{n} = 53{,}8$; $S_y^2 = \frac{\sum y_i^2}{n} = 11{,}95$; $S_{cy}^2 = 13{,}4$

→ $m = 9$; $\bar{x} = \frac{\sum x_i}{n} = 49{,}8$; $S_x^2 = \frac{\sum x_i^2}{n} = 13{,}95$; $S_{cx}^2 = 15{,}7$

→ $F_{8,8,0.01} = 6{,}0288$

↓ Tabla II

→ $F_{8,8,0.99} = \frac{1}{F_{8,8,0.01}} = 0{,}1659$

$IC\left(\frac{\tau_A^2}{\tau_B^2}\right)\left[\frac{15{,}7}{13{,}4} \cdot 6{,}0288, \frac{15{,}7}{13{,}4} \cdot 0{,}1659\right] = [0.194, 7.063]$

↳ $1 \in IC$

↳ $\tau_1^2 = \tau_2^2$

$IC(\mu_1 - \mu_2) = \left[\bar{x} - \bar{y} \pm t_{m+n-2,\alpha/2} \cdot S_p \cdot \sqrt{1/n + 1/m}\right]$

↓ Formulario 1 (c)

$t_{9+7,0.01} = t_{16,0.01} =$

Tabla 7 ← $= 2{,}5835$

↳ $S_p^2 = \frac{n \cdot S_x^2 + m \cdot S_y^2}{n+m-2} = \frac{9 \cdot 13{,}95 + 9 \cdot 11{,}95}{9+9-2} = 14{,}57 \Rightarrow S_p = 3{,}82$

$$IC(\mu_1 - \mu_2) = \left[49{,}8 - 53{,}8 \pm 2{,}5835 \cdot 3{,}82 \cdot \sqrt{1/9 + 1/9}\right] =$$

$$= \left[-4 \pm 4{,}65227\right] = \left[-8{,}65227\ ,\ 0.65227\right]$$

B) Se puede admitir $\mu_B > \mu_A$?

- Calculamos cota superior intervalo : $(-\infty,\ \bar{x} - \bar{y} + t_{n+m-2,\,\gamma} \cdot S_p \sqrt{1/n + 1/m})$

→ Nivel confianza 95% : $t_{16,0.05} = 1{,}7459$

↓

Tabla 7

- $Ic\ (\mu_1 - \mu_2) : \left(-\infty,\ -4 + 1{,}7459 \cdot 3{,}82 \cdot \sqrt{2/9}\right) = (-\infty, -0{,}856)$

→ Cota superior < 0 ⇒ $\mu_1 < \mu_2$