3,

$n=10$, $\bar{x}=13.63$, $S=6.04$, $n-1=9$, $1-\alpha=0.98$, $\frac{\alpha}{2}=0.01$

$t_{0.01}(9)=2.821$

$\therefore \mu$ 之 98% 信賴區間為

$\bar{x} \pm t_{\frac{\alpha}{2}}(n-1)\frac{S}{\sqrt{n}} = 13.63 \pm 2.821 \times 1.91$

$= 13.63 \pm 5.39$

$\rightarrow (8.24, 19.02)$

4, (1) $1-\alpha=0.98$, $\frac{\alpha}{2}=0.01$, $z_{\frac{\alpha}{2}}=z_{0.01}=2.327$

P 之 98% 信賴區間:

$\Rightarrow \hat{P} \pm z_{\frac{\alpha}{2}}\sqrt{\frac{\hat{P}(1-\hat{P})}{n}} = 0.33 \pm 2.327 \times \sqrt{\frac{0.33 \times 0.67}{1,200}}$

$= 0.33 \pm 0.03$

$\rightarrow (0.30, 0.36)$

(2) $n=820$, $X=650$, $\hat{P}=\frac{X}{n}=\frac{650}{820}=0.79$ $1-\alpha=0.95$ $\frac{\alpha}{2}=0.025$

$z_{\frac{\alpha}{2}}=z_{0.025}=1.96$

$\therefore P$ 之 95% 信賴區間為

$\Rightarrow 0.79 \pm 1.96 \times \sqrt{\frac{0.79 \times 0.21}{820}}$

$= 0.79 \pm 1.96 \times 0.014 = 0.79 \pm 0.03$

$\Rightarrow (0.76, 0.82)$

14, $n=15$, $\bar{x}=1.173$, $s=0.80$, $1-\alpha=0.95$ $t_{\frac{\alpha}{2}}(n-1)=t_{0.025}(14)=2.145$

$1-\alpha=0.80$, $t_{\frac{\alpha}{2}}(n-1)=t_{0.10}(14)=1.345$

μ 之 95% 信賴區間

$\Rightarrow 1.173 \pm t_{0.025}(14)\frac{0.8}{\sqrt{15}}$

$= 1.173 \pm 2.145\frac{0.8}{\sqrt{15}}$

$= 1.173 \pm 0.44$

即 $[1.29, 2.17]$

μ 之 80% 信賴區間

$\Rightarrow 1.173 \pm t_{0.10}(14)\frac{0.8}{\sqrt{15}}$

$= 1.173 \pm 1.345\frac{0.8}{\sqrt{15}}$

$= 1.173 \pm 0.28$

即 $(1.45, 2.01)$