7.35 Since σ is unknown, use t-value to calc. the CI.
The assumption that the data are normal-distributed is necessary.

7.37 a) Use the Proposition (7.10) on pg. 288 of Devore's book.

b) Use the Proposition (7.12) on pg. 289 of Devore's book

c) Same as a)

7.45 a)

$$\begin{aligned} & P\left((\alpha/2)^{1/n} \le \tfrac{Y}{\theta} \le (1-\alpha/2)^{1/n}\right) \\ = & \int_{(\alpha/2)^{1/n}}^{(1-\alpha/2)^{1/n}} f_U(u)du \\ = & ((1-\alpha/2)^{1/n})^n - ((\alpha/2)^{1/n})^n = 1-\alpha \end{aligned}$$

So the $100(1-\alpha)\%$ CI for θ is

$$\left(\frac{\max(X_i)}{(1-\alpha/2)^{1/n}}, \frac{\max(X_i)}{(\alpha/2)^{1/n}}\right)$$

b)

$$\left(\max(X_i), \frac{\max(X_i)}{\alpha^{1/n}}\right)$$

c) Use the interval in b).

7.48 a) From Table A.6, we know that $P(2\lambda \sum X_i < 31.41) = .95$, so the bound is $\frac{31.41}{2*550.87} = .02851$

b) $e^{-100*.02851} = 0.05779$

8.4 Case A: $H_0 : \mu = 5$ versus $H_a : \mu > 5$
In this case, we acclaim that water is not unsafe (is safe) when we cannot reject H_0. Type II error make us acclaim that water is safe when it indeed is not. This is dangerous. Type I error is not bad thing for our health.
Case B: $H_0 : \mu = 5$ versus $H_a : \mu < 5$
In this case, we acclaim that water is safe when we reject H_0. Type I error make us acclaim that water is safe when it is indeed on the borderline. This is not so dangerous as Type II error in case A. Type II error is not bad also.
So we choose B.

8.6 Since both too big and too small the amperage will cost the menufacturer a lot, he must test like this: $H_0 : u = 40$ versus $H_a : u \neq 40$. Someone uses two tests. That is not correct because the problem ask you to design A test.

8.10 a) $H_0 : \mu = 10; H_a : \mu \neq 10$

b) $P(\text{unnecessary cali.}) = P(\bar{X} \geq 10.1032\text{or}\bar{X} \leq 9.8968|\mu = 10) = 1 - \Phi(\frac{10.1032-10}{.2/5}) + \Phi(\frac{9.8968-10}{.2/5}) = .0098$

c) $P(\text{not recali}|\mu = 10.1)$
$= P(\bar{x} < 10.1032\text{and}\bar{x} > 9.8968|\mu = 10.1)$
$= \Phi(\frac{10.1032-10.1}{.05}) - \Phi(\frac{9.8968-10.1}{.05})$
$= \Phi(0.064) + \Phi(-4.064)$
$= .5255 - .0003 = .525$

d) $c = \frac{10.1032-10}{.2/\sqrt{25}} = 2.064$

e) Use n=10 in the formula in d).

8.18 a) $z = \frac{\bar{x}-\mu}{\sigma/\sqrt{n}} = \frac{94.32-95}{1.20/4} = -2.27$
$z_{\alpha/2} = 2.575$ and $-z_{\alpha/2} < z < z_{\alpha/2}$
so cannot reject H_0.

b) This is a two tailed test, so use the corresponding formula in pg 319.
$Z_{\alpha/2} = 1.96$
$\frac{\mu_0-\mu'}{\sigma/sqrtn} = 3.33$
so the prob. is $\Phi(1.96+3.33) - \Phi(-1.96+3.33) = 1 - 0.9147 = 0.0853$

c) $n = [\frac{1.2(1.96+z_{0.1})}{95-94}]^2 = 16$

8.30 a) Use two-tailed test since we want to determine if 'these conditions differs from 100'.

b) $n = [\frac{7.5(z_{0.05/2}+z_{0.1})}{100-95}]^2 = 24$

9.2 Use the test procedure stated on pg.348. Reject H_0.

9.8 a) Test $H_0 : \mu_1 - \mu_2 = 2$ versus $H_a : \mu_1 - \mu_2 > 2$

b) Omitted.

9.18 Use the test procedure stated on pg.359. Cannot reject H_0.

9.37 Use the formula stated on pg.370 to calc. the CI.

9.42 a) Use the test procedure stated on pg.376. Reject H_0.

b) The prob. that H_0 will be rejected is the same as $(1-P(\text{type II error})$.
$P(\text{type II error})$ can be calc. using the method stated in pg.378.
$P(H_0\text{will be rejected}) = 0.9952$.