Answer Key — Sample Problems for Final Exam

Sample Solutions B1 to B6.

B1. —

(a) $P(4 \text{ typos}) = 0.0604$

$P(\text{Able typed it} \mid 4 \text{ typos}) = 0.2536$

(b) $$p(k) = \frac{1}{2}\,\frac{1^k}{k!}\,e^{-1} + \frac{1}{2}\cdot\frac{2^k}{k!}\,e^{-2}, \text{ for } k = 0, 1, 2, \cdots$$

(c) $3/2$

B.2 —

(a) Z test (large sample)

$Z = 1.658$ $\qquad Z > z_\alpha = 1.645 \Rightarrow$ REJECT H_0

(b) $[-0.0055, 0.0655]$

(c) Replacing n by $4n$ halves the length of the C.I.

$n = 6{,}000$ does it.

B3. —

(a) $\hat{\theta} = -5 / \ln\left(\prod_{i=1}^{5} y_i\right)$; $\hat{\theta} = 1.6885$ for given data

(b) $\theta^* = \dfrac{\bar{Y}}{(1-\bar{Y})}$; $\theta^* = 1.3810$ for given data.

B4. —

(a) $c = 15$

(b) $P(X \le 14) = 0.196$ when $p = 0.8$.

B5. —

(a) unbiased

(b) $\text{Var}(\hat{\mu}) = \dfrac{\delta^2\sigma^2}{m} + \dfrac{(1-\delta)^2 4\sigma^2}{n}$

Best $\delta = 4m/(n+4m)$

B6. —

(a) $[-6.397, 0.397]$

(b) T-test, 7 deg. fr.

$T = 1.673 > t_{0.1} = 1.415 \Rightarrow$ REJECT H_0.