

Ch8: Section 8.4

Question 8

$$(a) \hat{p} = 0.69$$

$$(b) \hat{p} \pm z_{\alpha/2} \sqrt{\frac{\hat{p}(1-\hat{p})}{n}}$$

$$z_{\alpha/2} = 2.576$$

$$n = 1390$$

$$CI = 0.69 \pm 2.576 \sqrt{\frac{0.69 \times 0.31}{1390}}$$

$$= 0.69 \pm 0.03195$$

$$= 0.658 \text{ to } 0.722$$

$$\text{Margin of Error } E = \cancel{0.32} \ 0.032$$

Question 7

$$X = 8$$

$$n = 20$$

$$p = \frac{8}{20} = 0.4$$

$$CI = p \pm z_{\alpha/2} \sqrt{\frac{p(1-p)}{n}}$$

$$z_{\alpha/2} = 1.96$$

$$= 0.4 \pm 1.96 \sqrt{\frac{0.4 \times 0.6}{20}}$$

$$= 0.4 \pm 0.2147$$

$$\text{Lower bound} = 18.53\%$$

$$\text{Upper bound} = 61.47\%$$

Question 6

$$MOE, E = 0.19$$

$$Z = 2.576$$

$$p = 0.5$$

$$n = \left(\frac{Z}{E}\right)^2 p(1-p)$$

$$= \left(\frac{2.576}{0.19}\right)^2 \cdot 0.5(1-0.5)$$

$$= 46$$

Question 5

$$X = 8$$

$$n = 20$$

$$Z_{\alpha/2} = 2.576$$

$$p = \frac{8}{20} = 0.4$$

$$CI = p \pm Z_{\alpha/2} \sqrt{\frac{p(1-p)}{n}}$$

$$= 0.4 \pm 2.576 \sqrt{\frac{0.4 \times 0.6}{20}}$$

$$= 0.4 \pm 0.2822$$

$$= (0.1178, 0.6822)$$

$$= 11.78\% \text{ to } 68.22\%$$

Question 4

$$E = 0.07$$

$$p = 0.5$$

$$Z_{\alpha/2} = 1.645$$

$$n = \left(\frac{1.645}{0.07}\right)^2 \cdot 0.5(1-0.5)$$

$$= 139$$

Question 2

$$n = 150$$

$$p = 0.93$$

$$(a) 0.896 \text{ to } 0.964$$

$$(b) 0.889 \text{ to } 0.971$$

$$(c) 0.876 \text{ to } 0.984$$

$$(d) \text{ Yes}$$

Question 3

$$n = 125, p = 0.71$$

$$(a) 0.605 \text{ to } 0.815$$

$$(b) 0.663 \text{ to } 0.757$$

$$(c) 0.678 \text{ to } 0.742$$

$$(d) \text{ Yes}$$