



Question # 1:

a. solution:

$$n_1 = 160 \quad n_2 = 220$$

$$\bar{x}_1 = 15.80 \quad \bar{x}_2 = 10.25$$

$$S_1^2 = 64 \quad S_2^2 = 47$$

$$1 - \alpha = 0.96$$

$$(\bar{x}_1 - \bar{x}_2) \pm Z_{\frac{\alpha}{2}} \sqrt{\frac{S_1^2}{n_1} + \frac{S_2^2}{n_2}}$$

$$Z_{\frac{\alpha}{2}} = 0.48$$

Now see value of $\frac{\alpha}{2}$ in the Z table

0.48 lie in the row 2.00 and lie in the column 0.06

$$Z_{\frac{\alpha}{2}} = 2.00 + 0.06$$

$$Z_{\frac{\alpha}{2}} = 2.06$$

Now put values in formula,

$$(15.80 - 10.25) \pm 2.06 \sqrt{\frac{64}{160} + \frac{47}{220}}$$

$$(5.55) \pm 2.06 \sqrt{\frac{135}{220}}$$

$$(5.55) \pm 5.1088$$

$$\begin{array}{ccc} 5.55 + 5.1088 & & 5.55 - 5.1088 \\ 10.6588 & \text{""""""""} & 0.3912 \end{array}$$

b. Solution:

$$n = 200 \quad \hat{p} = 0.30$$

$$\hat{q} = 1 - \hat{p} = 1 - 0.30 = 0.70$$

$$1 - \alpha = 0.95$$

$$\hat{p} \pm Z_{\frac{\alpha}{2}} \sqrt{\frac{\hat{p}\hat{q}}{n}}$$

$$Z_{\frac{\alpha}{2}}$$

$$\frac{\alpha}{2} = \frac{0.05}{2} = 0.025$$

Now see the value of $\frac{\alpha}{2}$ in the Z table.

0.025 lies in 1.9 rows and 0.06 columns

$$Z_{\frac{\alpha}{2}} = 1.9 + 0.06$$

$$Z_{\frac{\alpha}{2}} = 1.96$$

Now put values in formula,

$$0.30 \pm 1.96 \sqrt{\frac{(0.30)(0.70)}{200}}$$

$$0.30 \pm 1.96(0.0324)$$

$$0.30 \pm 0.063504$$

$$\begin{array}{ccc} 0.30 + 0.063504 & & 0.30 - 0.063504 \\ 0.364 & \text{""""""""} & 0.236 \end{array}$$

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