SOLUTIONS
King Fahd University of Petroleum & Minerals
Department of Mathematical Science
STAT-211-Term042-I
Quiz #7   Section:
Name: ID: Serial:

Question One (5-Points)

Write **True** if the statement is true or **False** if not:

1. A 95 percent confidence interval estimate will have a margin of error that is approximately + 95 percent of the size of the population mean. **False**
2. Increasing the sample size will result in a point estimate that is closer to the true population value. **False**
3. In estimating a population proportion, the factors that are needed to determine the required sample size are the confidence level, the margin of error and some idea of what the population proportion is. **True**
4. The margin of error is the difference between the point estimate and the parameter. **False**
5. In estimating a population mean, increasing the confidence level will result in a higher margin of error for a given sample size. **True**

Question Two (5-Points)

The annual income for independent sales representatives in the United States is thought to be highly right-skewed, if a sample of 36 independent sales representatives is selected and yields a mean equal to \$144,300 and a standard deviation of \$32.45. Given this information,

1. Find 98 % confidence interval for the true mean.

2. Suppose it is known that the population standard deviation is \$32.45. Determine how many **more** items must be sampled to obtain the a confidence interval estimate for the population mean if the confidence level is 90 % with a margin of error of $\pm$ 2.5.

$$1-\alpha=0.98 \Rightarrow Z_{\frac{\alpha}{2}}=Z_{.01}=2.33$$

1. A 98% C.I. for μ is : $\overline{X} \pm Z_{\frac{\alpha}{2}}.\frac{S}{\sqrt{n}}=144,300\pm(2.33).\frac{32.45}{\sqrt{36}}$

$$144,300 \pm 12.6014$$

$$144,287.4...............144,312.6$$

$$1-\alpha=0.90 \Rightarrow Z_{\frac{\alpha}{2}}=Z_{.05}=1.645$$

2. $n=\left(\frac{Z_{\alpha/2}.\sigma}{e}\right)^2=\left(\frac{(1.645).(32.45)}{2.5}\right)=455.91\approx 456$

The number of additional items = 456 - 36 = 420