# Practice Questions for BUS173 (Chapter: 7)

#### Ex. 7.5

Given a population with mean  $\mu = 100$  and variance  $\sigma^2 = 81$ , the central limit applies when the sample size  $n \ge 25$ . A random sample of size n = 25 is obtained. Include diagram where necessary:

- a. What are the mean and variance of the sampling distribution for the sample mean?
- b. What is the probability that  $\bar{x} > 102$ ?
- c. What is the probability that  $98 \le \overline{x} \le 101$ ?
- d. What is the probability that  $\bar{x} \le 101.5$ ?

# Ex. 7.32

A record storeowner finds that 20% of customers entering her store make a purchase. One morning 180 people, who can be regarded as a random sample of all customers, enter the store.

- a. What is the mean of the distribution of the sample proportion of customers making a purchase?
- b. What is the variance of the sample proportion?
- c. What is the standard error (or deviation) of the sample proportion?
- d. What is the probability that the sample proportion is less than 0.15?

# Ex. 7.36

A corporation is considering a new issue of converting bonds. Management believes that the offer terms will be found attractive by 20% of all its current stockholders. Suppose that this belief is correct. A random sample of 130 current stockholders is taken.

- a. Find the variance and standard error of the sampling proportion.
- b. What is the probability that the sample proportion is more than 0.15?
- c. Find the probability that the sample proportion is between 0.18 and 0.22.
- d. Suppose that a sample of 500 current stockholders had been taken. Without doing any calculations, state whether the probabilities in parts (b) and (c) would have been higher, lower or the same as those found.

#### **Example 8.4 (Confidence Interval)**

A process produces bags of refined sugar. The weights of the content of these bags are normally distributed with standard deviation 1.2 ounces. The content of a random sample of 25 bags has a mean weight of 19.8 ounces. Find the upper and lower confidence limits of a 99% confidence interval for the true mean weight for all bags of sugar produced by the process.