Name **PSY337--Statistics**
Date **Assignment #10**

1. Suppose that the batting average for all major league baseball players after each team completes 100 games through the season is 0.248 and the standard deviation is 0.034. The null hypothesis is that American League infielders average the same as all other major league players. A sample of 46 players taken from the American League reveals a mean batting average of 0.255. What is the value of the test statistic, z (rounded to two decimal places)?

2. In a hypothesis test with hypotheses $H_0: \mu = 60$ and $H_1: \mu \neq 60$, a random sample of 37 elements selected from the population produced a mean of 62.5. Assuming that $\sigma =$5.2 and the population is normally distributed, what is the approximate *p*-value for this test? (Round your answer to four decimal places)

3. In a hypothesis test with hypotheses $H_0: \mu \leq 125$ and $H_1: \mu > 125$, a random sample of 131 elements selected from the population produced a mean of 131.6. Assuming that $\sigma =$ 18.8, what is the approximate *p*-value for this test? (Round your answer to four decimal places)

4. Use the following to answer questions (a)-(d):

In a hypothesis test with hypotheses $H_0: \mu \geq 80$ and $H_1: \mu < 80$, a random sample of 99 elements selected from the population produced a mean of 75.3. Assume that $\sigma =$24.6, and that the test is to be made at the 5% significance level.

(a) What is the critical value of *z*?

A) 1.88 B) 2.17 C) -1.88 D) -2.17

(b) What is the value of the test statistic, *z*, rounded to three decimal places?

(c) What is the *p*-value for this hypothesis test, rounded to four decimal places?

(d) Should you reject or fail to reject the null hypothesis in this test? (State your answer as "reject" or "fail to reject", but don't include the quotation marks.)

5. Use the following to answer questions (a)-(e):

A company that manufactures light bulbs claims that its light bulbs last an average of 1,150 hours. A sample of 25 light bulbs manufactured by this company gave a mean life of 1,097 hours and a standard deviation of 133 hours. A consumer group wants to test the hypothesis that the mean life of light bulbs produced by this company is less than 1,150 hours. The significance level is 5%. Assume the population is normally distributed.

(a) What is the critical value of *t*?
A) -1.704 B) -1.711 C) -2.797 D) -2.787

(b) What is the value of the test statistic, *t*, rounded to three decimal places?

(c) What is the *p*-value for this hypothesis test, rounded to four decimal places?

(d) Should you reject or fail to reject the null hypothesis in this test? (State your answer as "reject" or "fail to reject", but don't include the quotation marks.)

(e) Does the data provide evidence to contradict the company's claim about the average lifetime of their light bulbs? (State your answer as "no" or "yes", but don't include the quotation marks.)