WS 8/ Chapter 7

Name_____

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Provide an appropriate response.

1) The mean IQ of statistics teachers is greater than 120. Write the null and alternative hypotheses. 1) _____

2) The dean of a major university claims that the mean time for students to earn a Master's degree is at most 3.5 years. Write the null and alternative hypotheses. 2) _____

3) The mean score for all NBA games during a particular season was less than 109 points per game. State this claim mathematically. Write the null and alternative hypotheses. Identify which hypothesis is the claim. 3) _____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

4) Given $H_0: \mu \leq 25$ and $H_a: \mu > 25$, determine whether the hypothesis test is left-tailed, right-tailed, or two-tailed. 4) _____

A) right-tailed B) two-tailed C) left-tailed

5) A researcher claims that 73% of voters favor gun control. Determine whether the hypothesis test for this claim is left-tailed, right-tailed, or two-tailed. 5) _____

A) left-tailed B) right-tailed C) two-tailed

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

6) The mean IQ of statistics teachers is greater than 120. Identify the type I and type II errors for the hypothesis test of this claim. 6) _____

7) The mean score for all NBA games during a particular season was less than 100 points per game. Identify the type I and type II errors for the hypothesis test of this claim. 7) _____

8) A fast food outlet claims that the mean waiting time in line is less than 4.9 minutes. A random sample of 60 customers has a mean of 4.8 minutes with a standard deviation of 0.6 minute. If $\alpha = 0.05$, test the fast food outlet's claim. 8) _____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

9) Suppose you want to test the claim that $\mu > 25.6$. Given a sample size of $n = 42$ and a level of significance of $\alpha = 0.1$, when should you reject H_0? 9) _____

A) Reject H_0 if the standardized test statistic is greater than 2.575.

B) Reject H_0 if the standardized test statistic is greater than 1.645.

C) Reject H_0 if the standardized test statistic is greater than 1.96.

D) Reject H_0 if the standardized test statistic is greater than 1.28.

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

10) A local brewery distributes beer in bottles labeled 32 ounces. A government agency thinks that the brewery is cheating its customers. The agency selects 50 of these bottles, measures their contents, and obtains a sample mean of 31.6 ounces with a standard deviation of 0.70 ounce. Use a 0.01 significance level to test the agency's claim that the brewery is cheating its customers. 10) _____

11) A local group claims that the police issue at least 60 speeding tickets a day in their area. To prove their point, they randomly select one month. Their research yields the number of tickets issued for each day. The data are listed below. At $\alpha = 0.01$, test the group's claim. 11) _____

70	48	41	68	69	55	70	57	60	83
32	60	72	58	88	48	59	60	56	65
66	60	68	42	57	59	49	70	75	63
44									

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

12) Find the critical values for a sample with n = 10 and $\alpha = 0.05$ if H_0: $\mu \geq 20$. 12) _____

A) -1.383 B) -2.262 C) -1.833 D) -3.250

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

13) A local brewery distributes beer in bottles labeled 12 ounces. A government agency thinks that the brewery is cheating its customers. The agency selects 20 of these bottles, measures their contents, and obtains a sample mean of 11.7 ounces with a standard deviation of 0.7 ounce. Use a 0.01 significance level to test the agency's claim that the brewery is cheating its customers. 13) _____

14) A local group claims that the police issue more than 60 speeding tickets a day in their area. To prove their point, they randomly select two weeks. Their research yields the number of tickets issued for each day. The data are listed below. At $\alpha = 0.01$, test the group's claim. 14) _____

70	48	41	68	69	55	70
57	60	83	32	60	72	58

15) A telephone company claims that 20% of its customers have at least two telephone lines. The company selects a random sample of 500 customers and finds that 88 have two or more telephone lines. At $\alpha = 0.05$, does the data support the claim? Use a P-value. 15) _____

16) A telephone company claims that 20% of its customers have at least two telephone lines. The company selects a random sample of 500 customers and finds that 88 have two or more telephone lines. If $\alpha = 0.05$, test the company's claim using confidence intervals. 16) _____

1) $H_0: \mu \leq 120$, $H_a: \mu > 120$
2) $H_0: \mu \leq 3.5$, $H_a: \mu > 3.5$
3) claim: $\mu < 109$; $H_0: \mu \geq 109$, $H_a: \mu < 109$; claim is H_a
4) A
5) C
6) type I: rejecting $H_0: \mu \leq 120$ when $\mu \leq 120$
   type II: failing to reject $H_0: \mu \leq 120$ when $\mu > 120$
7) type I: rejecting $H_0: \mu \geq 100$ when $\mu \geq 100$
   type II: failing to reject $H_0: \mu \geq 100$ when $\mu < 100$
8) Fail to reject H_0; There is not enough evidence to support the fast food outlet's claim that the mean waiting time is less than 4.9 minutes.
9) D
10) standardized test statistic ≈ -4.04; critical value $z_0 = -2.33$; reject H_0; The data support the agency's claim.
11) $\bar{x} = 60.4$, $s = 12.2$, standardized test statistic ≈ 0.18; critical value $z_0 = 2.33$; fail to reject H_0; There is not sufficient evidence to reject the claim.
12) C
13) critical value $t_0 = -2.539$; standardized test statistic ≈ -1.917; fail to reject H_0; There is not sufficient evidence to support the government agency's claim.
14) $\bar{x} = 60.21$, $s = 13.43$; critical value $t_0 = 2.650$; standardized test statistic ≈ 0.060; fail to reject H_0; There is not sufficient evidence to support the claim.
15) $\alpha = 0.05$; P-value = 0.0901; $P > \alpha$; fail to reject H_0; There is not sufficient evidence to reject the telephone company's claim.
16) Confidence interval (0.143, 0.209); 20% lies in the interval, fail to reject H_0; There is not sufficient evidence to reject the company's claim.