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

Provide an appropriate response.

1) Given \( H_0: \mu \leq 25 \) and \( H_a: \mu > 25 \), determine whether the hypothesis test is left-tailed, right-tailed, or two-tailed.
   A) right-tailed  
   B) two-tailed  
   C) left-tailed

2) A brewery claims that the mean amount of beer in their bottles is at least 12 ounces. Determine whether the hypothesis test for this claim is left-tailed, right-tailed, or two-tailed.
   A) two-tailed  
   B) left-tailed  
   C) right-tailed

3) The owner of a professional basketball team claims that the mean attendance at games is over 25,000 and therefore the team needs a new arena. Determine whether the hypothesis test for this claim is left-tailed, right-tailed, or two-tailed.
   A) two-tailed  
   B) right-tailed  
   C) left-tailed

4) The mean age of bus drivers in Chicago is 56.9 years. If a hypothesis test is performed, how should you interpret a decision that fails to reject the null hypothesis?
   A) There is sufficient evidence to support the claim \( \mu = 56.9 \).
   B) There is not sufficient evidence to reject the claim \( \mu = 56.9 \).
   C) There is sufficient evidence to reject the claim \( \mu = 56.9 \).
   D) There is not sufficient evidence to support the claim \( \mu = 56.9 \).

5) The mean age of bus drivers in Chicago is greater than 48.7 years. If a hypothesis test is performed, how should you interpret a decision that rejects the null hypothesis?
   A) There is not sufficient evidence to reject the claim \( \mu > 48.7 \).
   B) There is sufficient evidence to support the claim \( \mu > 48.7 \).
   C) There is sufficient evidence to support the claim \( \mu > 48.7 \).
   D) There is sufficient evidence to reject the claim \( \mu > 48.7 \).

6) The mean age of bus drivers in Chicago is 47.4 years. If a hypothesis test is performed, how should you interpret a decision that rejects the null hypothesis?
   A) There is not sufficient evidence to support the claim \( \mu = 47.4 \).
   B) There is sufficient evidence to support the claim \( \mu = 47.4 \).
   C) There is sufficient evidence to reject the claim \( \mu = 47.4 \).
   D) There is not sufficient evidence to reject the claim \( \mu = 47.4 \).
7) The mean age of bus drivers in Chicago is greater than 56.2 years. If a hypothesis test is performed, how should you interpret a decision that fails to reject the null hypothesis?
   A) There is sufficient evidence to reject the claim $\mu > 56.2$.
   B) There is not sufficient evidence to reject the claim $\mu > 56.2$.
   C) There is not sufficient evidence to support the claim $\mu > 56.2$.
   D) There is sufficient evidence to support the claim $\mu > 56.2$.

8) 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. Identify the claim.
   A) $H_0: \mu \leq 3.5$ (claim); $H_a: \mu > 3.5$
   B) $H_0: \mu \geq 3.5$ (claim); $H_a: \mu < 3.5$
   C) $H_0: \mu = 3.5$ (claim); $H_a: \mu \neq 3.5$
   D) $H_0: \mu \leq 3.5$; $H_a: \mu > 3.5$ (claim)

9) Suppose you are using $\alpha = 0.01$ to test the claim that $\mu = 1120$ using a P-value. You are given the sample statistics $n = 35, \bar{x} = 1090$, and $s = 82$. Find the P-value.
   A) 0.0154  B) 0.0077  C) 0.0308  D) 0.3169

10) Suppose you are using $\alpha = 0.05$ to test the claim that $\mu \neq 36$ using a P-value. You are given the sample statistics $n = 35, \bar{x} = 35.1$, and $s = 2.7$. Find the P-value.
    A) 0.0488  B) 0.0244  C) 0.1003  D) 0.0591

11) Find the critical value for a right-tailed test with $\alpha = 0.01$ and $n = 75$.
    A) 1.645  B) 1.96  C) 2.33  D) 2.575

12) Find the critical value for a two-tailed test with $\alpha = 0.10$ and $n = 100$.
    A) $\pm 2.33$  B) $\pm 2.575$  C) $\pm 1.96$  D) $\pm 1.645$

13) Find the critical value for a left-tailed test with $\alpha = 0.025$ and $n = 50$.
    A) -1.96  B) -1.645  C) -2.575  D) -2.33

14) You wish to test the claim that $\mu > 6$ at a level of significance of $\alpha = 0.05$ and are given sample statistics $n = 50, \bar{x} = 6.3$, and $s = 1.2$. Compute the value of the standardized test statistic. Round your answer to two decimal places.
    A) 2.31  B) 0.98  C) 1.77  D) 3.11

15) You wish to test the claim that $\mu = 1200$ at a level of significance of $\alpha = 0.01$ and are given sample statistics $n = 35, \bar{x} = 1170$ and $s = 82$. Compute the value of the standardized test statistic. Round your answer to two decimal places.
    A) -4.67  B) -5.18  C) -3.82  D) -2.16
16) Suppose you want to test the claim that $\mu \neq 3.5$. Given a sample size of $n = 31$ and a level of significance of $\alpha = 0.10$, when should you reject $H_0$?

A) Reject $H_0$ if the standardized test statistic is greater than 2.575 or less than -2.575.
B) Reject $H_0$ if the standardized test statistic is greater than 2.33 or less than -2.33.
C) Reject $H_0$ if the standardized test statistic is greater than 1.96 or less than -1.96.
D) Reject $H_0$ if the standardized test statistic is greater than 1.645 or less than -1.645.

17) Suppose you want to test the claim that $\mu \geq 65.4$. Given a sample size of $n = 35$ and a level of significance of $\alpha = 0.05$, when should you reject $H_0$?

A) Reject $H_0$ if the standardized test statistic is less than -1.645.
B) Reject $H_0$ if the standardized test statistic is less than -2.575.
C) Reject $H_0$ if the standardized test statistic is less than -1.28.
D) Reject $H_0$ if the standardized test statistic is less than -2.33.

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

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

19) Find the standardized test statistic $t$ for a sample with $n = 15$, $\bar{x} = 7$, $s = 0.8$, and $\alpha = 0.05$ if $H_0$: $\mu \leq 6.7$. Round your answer to three decimal places.

A) 1.631  B) 1.728  C) 1.452  D) 1.312

20) Find the standardized test statistic $t$ for a sample with $n = 12$, $\bar{x} = 17.4$, $s = 2.1$, and $\alpha = 0.01$ if $H_a$: $\mu \neq 17.9$. Round your answer to three decimal places.

A) -0.381  B) -0.037  C) -0.825  D) -0.008

21) Determine whether the normal sampling distribution can be used. The claim is $p = 0.75$ and the sample size is $n = 18$.

A) Use the normal distribution.  B) Do not use the normal distribution.

22) Determine the standardized test statistic, $z$, to test the claim about the population proportion $p > 0.015$ given $n = 50$ and $\hat{p} = 0.61199999$. Use $\alpha = 0.01$.

A) -3.01  B) -1.28  C) -1.36  D) -2.1800001

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

23) A local school district claims that the number of school days missed by its teachers due to illness is below the national average of 5. A random sample of 40 teachers provided the data below. At $\alpha = 0.05$, test the district’s claim using P-values.

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0 3 6 3 3 5 4 1 3 5
7 3 1 2 3 3 2 4 1 6
2 5 2 8 3 1 2 5 4 1
1 1 2 1 5 7 5 4 9 3
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24) A recent study claimed that at least 15% of junior high students are overweight. In a sample of 160 students, 18 were found to be overweight. At $\alpha = 0.05$, test the claim.
Answer Key
Testname: CH 6-7 PRETEST

1) A
2) B
3) B
4) B
5) C
6) C
7) C
8) A
9) C
10) A
11) C
12) D
13) A
14) C
15) D
16) D
17) A
18) A
19) C
20) C
21) B
22) C
23) P-value = 0.000001, P < α, reject H₀; There is sufficient evidence to support the school district’s claim.
24) critical value z₀ = -1.645; standardized test statistic ≈ -1.33; fail to reject H₀; There is not sufficient evidence to reject the claim.