Name_____

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

For samples of the specified size from the population described, find the mean and standard deviation of the sample mean $\bar{x}$.

1) The National Weather Service keeps records of snowfall in mountain ranges. Records indicate that in a certain range, the annual snowfall has a mean of 75 inches and a standard deviation of 12 inches. Suppose the snowfalls are sampled during randomly picked years. For samples of size 36, determine the mean and standard deviation of $\bar{x}$. 1) _____

A) $\mu_{\bar{x}} = 75; \sigma_{\bar{x}} = 12$

B) $\mu_{\bar{x}} = 12; \sigma_{\bar{x}} = 75$

C) $\mu_{\bar{x}} = 2; \sigma_{\bar{x}} = 75$

D) $\mu_{\bar{x}} = 75; \sigma_{\bar{x}} = 2$

Find the indicated probability or percentage for the sampling error.

2) The monthly expenditures on food by single adults living in one neighborhood of Los Angeles are normally distributed with a mean of $410 and a standard deviation of $75. Determine the probability of samples of size 9 that have mean expenditures of $390. 2) _____

A) 0.7881 B) 0.3936 C) 0.5762 D) 0.2119

Estimate the indicated probability by using the normal distribution as an approximation to the binomial distribution.

3) With n = 20 and p = 0.60, estimate P(less than or equal to 8). 3) _____

A) 0.4953 B) 0.4332 C) 0.0668 D) 0.0548

Solve the problem.

4) Find the value of α that corresponds to a level of confidence of 96%. 4) _____

A) 0.004 B) 0.04 C) 0.96 D) 4

Find the indicated margin of error.

5) Out of 200 trials, 80 turned out positive. Find the margin of error for the 95% confidence interval used to estimate the population proportion. 5) _____

A) 0.0713 B) 0.0679 C) 0.0611 D) 0.0815

6) A researcher wishes to estimate the proportion of adults in the city of Darby who are vegetarian. In a random sample of 1524 adults from this city, the proportion that are vegetarian is 0.057. Find a 90% confidence interval for the true proportion of vegetarians in the city of Darby. 6) _____

A) From 0.0494 to 0.0646
B) From 0.0511 to 0.0629
C) From 0.0359 to 0.0781
D) From 0.0472 to 0.0668

Assume that you wish to estimate a population proportion, p. For the given margin of error and confidence level, determine the sample size required.

7) You wish to estimate the proportion of shoppers that use credit cards. Determine the sample size needed. It is deemed reasonable to presume that of those samples, the percentage using credit cards will be at least 60%. The margin of error should be at most 0.01. The confidence level is 95%. 7) _____

A) 8298 B) 23,050 C) 15,914 D) 9220

Determine the margin of error in estimating the population mean, μ.

8) A sample of 74 college students yields a mean annual income of \$3494. Assuming that σ = \$844, find the margin of error in estimating μ at the 99% level of confidence. 8) _____

A) \$9 B) \$1046 C) \$229 D) \$253

Find the specified t-value.

9) For a two-tailed t-curve with df = 4, find $t_{0.10}$. 9) _____

A) 2.353 B) 4.604 C) 2.132 D) 1.645

Find the confidence interval specified. Assume that the population is normally distributed.

10) A sociologist develops a test to measure attitudes about public transportation, and 27 randomly selected subjects are given the test. Their mean score is 76.2 and their standard deviation is 21.4. Construct the 95% confidence interval for the mean score of all such subjects. 10) _____

A) 64.2 to 88.2 B) 67.7 to 84.7 C) 74.6 to 77.8 D) 69.2 to 83.2

A hypothesis test is to be performed. Determine the null and alternative hypotheses.

11) In the past, the mean running time for a certain type of flashlight battery has been 9.6 hours. The manufacturer has introduced a change in the production method and wants to perform a hypothesis test to determine whether the mean running time has changed as a result. 11) _____

A) $H_0: \mu \neq 9.6$ hours
$H_1: \mu = 9.6$ hours

B) $H_0: \mu = 9.6$ hours
$H_1: \mu \neq 9.6$ hours

C) $H_0: \mu = 9.6$ hours
$H_1: \mu > 9.6$ hours

D) $H_0: \mu \geq 9.6$ hours
$H_1: \mu = 9.6$ hours

12) At one school, the average amount of time that tenth-graders spend watching television each week is 21.6 hours. The principal introduces a campaign to encourage the students to watch less television. One year later, the principal wants to perform a hypothesis test to determine whether the average amount of time spent watching television per week has decreased. 12) _____

A) $H_0: \mu = 21.6$ hours
$H_1: \mu < 21.6$ hours

B) $H_0: \mu = 21.6$ hours
$H_1: \mu \leq 21.6$ hours

C) $H_0: \mu = 21.6$ hours
$H_1: \mu > 21.6$ hours

D) $H_0: \mu < 21.6$ hours
$H_1: \mu = 21.6$ hours

Classify the hypothesis test as two-tailed, left-tailed, or right-tailed.

13) A manufacturer claims that the mean amount of juice in its 16 ounce bottles is 16.1 ounces. A consumer advocacy group wants to perform a hypothesis test to determine whether the mean amount is actually less than this. 13) _____

A) Right-tailed B) Two-tailed C) Left-tailed

14) In 1990, the average duration of long-distance telephone calls originating in one town was 7.2 minutes. A long-distance telephone company wants to perform a hypothesis test to determine whether the average duration of long-distance phone calls has changed from the 1990 mean of 7.2 minutes. 14) _____

A) Left-tailed B) Right-tailed C) Two-tailed

A hypothesis test is to be performed for a population proportion. For the given sample data and null hypothesis, compute the value of the test statistic, $z = \frac{\hat{p} - p}{\sqrt{pq/n}}$

15) Out of 116 observations, 63% were successes. H_0: p = 0.49. 15) _____

A) 1.723 B) 3.016 C) 1.291 D) 0.006

Classify the conclusion of the hypothesis test as a Type I error, a Type II error, or a correct decision.

16) In the past, the mean running time for a certain type of flashlight battery has been 9.6 hours. The manufacturer has introduced a change in the production method and wants to perform a hypothesis test to determine whether the mean running time has increased as a result. The hypotheses are: 16) _____

$H_0: \mu = 9.6$ hours

$H_1: \mu > 9.6$ hours

Suppose that the results of the sampling lead to nonrejection of the null hypothesis. Classify that conclusion as a Type I error, a Type II error, or a correct decision, if in fact the mean running time has increased.

A) Type I error B) Type II error C) Correct decision

A one-sample z-test for a population mean is to be performed. The value obtained for the test statistic, $z = \frac{x - \mu_0}{\sigma/\sqrt{n}}$, is given. The nature of the test (right-tailed, left-tailed, or two-tailed) is also specified. Determine the P-value.

17) A right-tailed test: 17) _____

z = 2.38

A) 0.0174 B) 0.0087 C) 0.9826 D) 0.9913

Obtain the linear correlation coefficient for the data. Round your answer to three decimal places.

18) Data was obtained showing the cost of advertising (x), in thousands of dollars, and the number of products sold (y), in thousands, for each of ten randomly selected product lines. Analysis of the data is summarized below: 18) _____

$\sum x = 60$

$\sum y = 70$

$\sum xy = 475$

$\sum x^2 = 440$

$\sum y^2 = 545$

A) 0.446 B) 0.915 C) 0.829 D) -0.871

Determine the regression equation for the data. Round the final values to three significant digits, if necessary.

19)

x	0	3	4	5	12
y	8	2	6	9	12

19) _____

A) $\hat{y} = 4.88 + 0.525x$ B) $\hat{y} = 4.88 + 0.625x$ C) $\hat{y} = 4.98 + 0.425x$ D) $\hat{y} = 4.98 + 0.725x$

Use the regression equation to predict the y-value corresponding to the given x-value. Round your answer to the nearest tenth.

20) Nine pairs of data yield the regression equation $\hat{y} = 19.4 + 0.93x$. Predict y for x = 42? 20) _____

A) 58.5 B) 79.6 C) 57.8 D) 64.7