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724 Readiness Exam

Multiple Choice

Identify the choice that best completes the statement or answers the question.

- _____ 1. The relationship between a statistic and a parameter is the same as the relationship between
- a sample and a population.
 - a dependent variable and an independent variable.
 - descriptive statistics and inferential statistics.
 - an operational definition and a hypothetical construct.
- _____ 2. The *average score* for an entire population would be an example of a _____.
- parameter
 - statistic
 - variable
 - constant
- _____ 3. Classifying people according to gender (male/female) would involve measurement on a(n) _____ scale of measurement.
- nominal
 - ordinal
 - interval
 - ratio
- _____ 4. For the following scores, what is $\Sigma(X + 1)^2$?
Scores: 3, 0, 5, 2
- 61
 - 62
 - $(14)^2 = 196$
 - $11^2 = 121$

Exhibit 2-2

Refer to the following table showing a frequency distribution of quiz scores.

<u>X</u>	<u>frequency</u>
5	6
4	5
3	5
2	3
1	2

- _____ 5. Refer to Exhibit 2-2. If a score of $X = 3$ or higher is needed for a passing grade, how many individuals passed?
- 3
 - 11
 - 16
 - cannot be determined from the information given

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- _____ 6. What is the value of the mean for the following set of scores?
Scores: 1, 3, 5, 0, 1
- 10
 - 5
 - 2.5
 - 2
- _____ 7. A sample has a mean of $M = 25$. If a new score with a value of $X = 25$ is added to the sample, what effect will it have on the sample mean?
- The sample mean will increase.
 - The sample mean will decrease.
 - The sample mean will remain the same.
 - cannot be determined from the information given
- _____ 8. In a positively skewed distribution, which measure of central tendency will have the largest value?
- mean
 - median
 - mode
 - impossible to determine from the information given
- _____ 9. Which of the following symbols identifies the population standard deviation?
- s
 - s^2
 - σ
 - σ^2
- _____ 10. A sample of $n = 5$ scores has SS (i.e. sum of squared deviations or sum of squares) = 40. What is the variance for this sample?
- $40/5 = 8$
 - $40/4 = 10$
 - $5(40) = 200$
 - $4(40) = 160$
- _____ 11. Which set of scores has the least amount of variability?
- 11, 17, 31, 53
 - 5, 11, 42, 22
 - 145, 143, 145, 147
 - 27, 105, 10, 80
- _____ 12. A z-score of $z = -2.00$ indicates a position in a distribution _____.
- above the mean by 2 points
 - above the mean by a distance equal to 2 standard deviations
 - below the mean by 2 points
 - below the mean by a distance equal to 2 standard deviations
- _____ 13. Of the following z-score values, which one represents the location closest to the mean?
- $z = +0.50$
 - $z = +1.00$
 - $z = -1.00$
 - $z = -2.00$

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- _____ 14. For a population with $\mu = 80$ and $\sigma = 12$, the z-score corresponding to $X = 74$ is $z =$ _____.
a. 6
b. -6
c. .50
d. -.50
- _____ 15. For a population with $\mu = 60$ and $\sigma = 8$, what is the X value corresponding to $z = 1.50$?
a. 12
b. 61.5
c. 72
d. 90
- _____ 16. A z-score of $z = +3.00$ indicates a location that is _____.
a. near the center of the distribution
b. slightly above the mean
c. far above the mean in the extreme right-hand tail of the distribution
d. the location depends on the mean and standard deviation for the distribution
- _____ 17. A population with $\mu = 85$ and $\sigma = 12$ is transformed into z-scores. After the transformation, the population of z-scores will have a standard deviation of _____.
a. 12
b. 1
c. 0
d. cannot be determined from the information given
- _____ 18. Probability values are always _____.
a. greater than or equal to 0
b. less than or equal to 1
c. positive numbers
d. All of the other 3 choices are correct.
- _____ 19. A jar contains 40 red marbles and 10 black marbles. If you take a random sample of one marble from this jar, what is the probability that the marble will be red?
a. 10/50
b. 40/50
c. 10/40
d. cannot be determined with the information given
- _____ 20. For a normal distribution with $\mu = 60$ with $\sigma = 8$, the probability of selecting a score greater than $X = 64$ is equal to _____.
a. the proportion of the distribution with z-scores greater than 0.50
b. the proportion of the distribution with z-scores greater than 1.00
c. the proportion of the distribution with z-scores greater than 2.00
d. the proportion of the distribution with z-scores greater than 4.00
- _____ 21. The standard deviation of the sampling distribution of sample means is called _____.
a. the expected value of the mean
b. the standard error of the mean
c. the sample mean
d. the central limit mean

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- _____ 22. A population has $\mu = 80$ with $\sigma = 8$. The distribution of sample means for samples of size $n = 4$ selected from this population would have a standard error of _____.
- 80
 - 8
 - 4
 - 2
- _____ 23. A random sample of $n = 9$ scores is obtained from a population with $\mu = 50$ and $\sigma = 9$. If the sample mean is $M = 53$, what is the z-score corresponding to the sample mean?
- $z = 0.33$
 - $z = 1.00$
 - $z = 3.00$
 - cannot determine without additional information
- _____ 24. A hypothesis test is _____.
- a descriptive technique that allows researchers to describe a sample
 - a descriptive technique that allows researchers to describe a population
 - an inferential technique that uses the data from a sample to draw inferences about a population
 - an inferential technique that uses information about a population to make predictions about a sample
- _____ 25. In a hypothesis test, a z-score value near zero _____.
- is probably in the critical region
 - means that you should probably reject the null hypothesis
 - is strong evidence of a statistically significant effect
 - None of the other options are correct.
- _____ 26. A Type I error is defined as
- rejecting a false null hypothesis
 - rejecting a true null hypothesis
 - failing to reject a false null hypothesis
 - failing to reject a true null hypothesis
- _____ 27. The power of a statistical test is the probability of _____.
- rejecting a true null hypothesis
 - supporting true null hypothesis
 - rejecting a false null hypothesis
 - supporting a false null hypothesis
- _____ 28. Which of the following is a fundamental difference between the t statistic and a z-score?
- The t statistic uses the sample mean in place of the population mean.
 - The t statistic uses the sample variance in place of the population variance.
 - The t statistic computes the standard error by dividing the standard deviation by $n - 1$ instead of dividing by n .
 - All of the above are differences between t and z.
- _____ 29. A research study uses a single sample of participants to evaluate the effect of a treatment. The results of the hypothesis test are reported as follows: " $t(14) = 2.73, p < .05$." Based on this report, how many individuals were in the sample?
- 13
 - 14
 - 15
 - cannot be determined from the information provided

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- _____ 30. In which of the following research situations would an independent samples t-test most likely be used?
- Evaluate the effectiveness of a diet program by measuring how much weight is lost during 4 weeks of dieting.
 - Evaluate the effectiveness of a cholesterol medication by comparing cholesterol levels before and after the medication.
 - Evaluate the difference in verbal skills between 3-year-old girls and 3-year-old boys.
 - Evaluate the development of verbal skills between age 2 and age 3 for a sample of girls.
- _____ 31. For which of the following situations would a dependent sample (i.e. repeated measures) t-test be appropriate?
- comparing verbal skills for girls versus boys at age 3
 - comparing pain tolerance before and after taking a new pain medication
 - comparing self-esteem for students who participate in school athletics versus those who do not
 - comparing problem solving skills for science majors versus art majors at a college
- _____ 32. A major concern with a repeated-measures study is the possibility that _____.
- you will obtain negative values for the difference scores
 - the results will be influenced by order effects
 - the mean difference is due to individual differences rather than treatment differences
 - All of the other options are major concerns.
- _____ 33. Which of the following most closely resembles the general form of an interval estimate?
- statistic = parameter \pm error
 - statistic = parameter \times error
 - parameter = statistic \pm error
 - error = parameter \pm statistic
- _____ 34. The purpose of a confidence interval is to _____.
- use a sample mean or mean difference to estimate the corresponding population mean or mean difference
 - use μ to estimate the value of a sample mean
 - use a level of confidence to estimate a sample mean
 - use the sample mean to determine a level of confidence
- _____ 35. If all other factors are held constant, which confidence level will produce the smallest width for a confidence interval?
- 99%
 - 90%
 - 75%
 - 60%
- _____ 36. A Pearson correlation of $r = -0.85$ indicates that a graph of the data would show _____.
- points clustered close to a line that slopes up to the right
 - points clustered close to a line that slopes down to the right
 - points widely scattered around a line that slopes up to the right
 - points widely scattered around a line that slopes down to the right
- _____ 37. Which of the following pairs of variables should produce a negative relationship.
- model year (2003, 2004, etc.) and price for a used Honda
 - driving distance from college and weekly cost of gas for a group of commuting college students
 - number of hours studying and number of errors on a math exam
 - IQ and weight for a group of third-grade students

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- _____ 38. For a hypothesis test for the Pearson correlation, the null hypothesis states that _____.
- a. there is a non-zero correlation for the general population
 - b. the population correlation is zero
 - c. there is a non-zero correlation for the sample
 - d. the sample correlation is zero
- _____ 39. For which of the following correlations would the data points be clustered most closely around the regression line?
- a. $r = 0.10$
 - b. $r = 0.50$
 - c. $r = -0.80$
 - d. There is no relationship between the correlation and how close the data points are to the regression line.
- _____ 40. If there is a negative correlation between X and Y then the regression equation, $Y = bX + a$, **must** have _____.
- a. $b > 0$
 - b. $b < 0$
 - c. $a > 0$
 - d. $a < 0$