

Disclaimer

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Final Exam Review



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DIRECTIONS: For this multiple-choice test, select the most appropriate answer for each statement or question.

1. Which of the following uses statistics?
 - a) Insurance companies
 - b) Pharmaceutical companies
 - c) Education
 - d) All of the above

2. Which of the following is not an aspect of descriptive statistics?
 - a) Analyzing data
 - b) Collecting data
 - c) Summarizing data
 - d) Organizing data

3. Which of the following is an aspect of inferential statistics?
 - a) Analyzing data
 - b) Drawing conclusions and making inferences
 - c) Making predictions
 - d) All of the above



4. A _____ is a clearly-defined question researchers would like to answer.
- a) research design
 - b) research conclusion
 - c) research question
 - d) research subjects
5. A _____ is all subjects of interest defined from the research study.
- a) population
 - b) sample
 - c) variable of interest
 - d) research question
6. A _____ is a subset of the population.
- a) population
 - b) variable of interest
 - c) sample
 - d) probability
7. A simple random sample is a sample in which each subject of the population has a(n) _____ chance of being selected.
- a) greater
 - b) lesser
 - c) 100%
 - d) equal



8. To gather a sample, a researcher divides the population into strata. The subjects in each stratum possess homogenous characteristics. Next, subjects are randomly selected from each stratum to be a part of the sample. This type of sampling is referred to as _____ sampling.
- a) systematic
 - b) stratified
 - c) cluster
 - d) convenience
9. A _____ sample is a sample in which clusters of subjects are randomly selected from the population.
- a) stratified
 - b) cluster
 - c) convenience
 - d) systematic
10. A _____ sample is a sample in which every x^{th} subject is randomly selected from the population.
- a) simple random
 - b) stratified
 - c) systematic
 - d) cluster
11. When subjects are conveniently selected from a population (e.g. selecting the first 50 people who leave a movie theater), a _____ sampling method is being used.
- a) simple random
 - b) systematic
 - c) stratified
 - d) convenience



12. _____ bias is a bias that occurs when subjects do not respond to a questionnaire (survey) or cannot be contacted.
- a) Nonresponse
 - b) Response
 - c) Undercoverage
 - d) All around
13. _____ bias is a bias that occurs when a question is poorly worded or when an interviewer can influence the subjects' response.
- a) Undercoverage
 - b) Nonresponse
 - c) Response
 - d) Convenience
14. _____ bias is a bias that occurs when representative subjects are not included in the sample selection process.
- a) Random
 - b) Response
 - c) Nonresponse
 - d) Undercoverage
15. A characteristic of the population is called a _____.
- a) variable of interest
 - b) data
 - c) simple random sample
 - d) sample



16. _____ data is data that can be categorized.
- a) Discrete
 - b) Continuous
 - c) Qualitative
 - d) Quantitative
17. _____ data is data that can be quantified.
- a) Quantitative
 - b) Qualitative
 - c) Categorical
 - d) Nonresponse
18. Quantitative values that are countable are considered _____.
- a) discrete
 - b) continuous
 - c) qualitative
 - d) categorical
19. Quantitative values that are measurable are considered _____.
- a) continuous
 - b) discrete
 - c) measurement
 - d) qualitative



20. Which of the following is not a data collection technique?
- a) A personal interview
 - b) A mailed questionnaire
 - c) Direct observation
 - d) A research question
21. A(n) _____ study is a study in which treatment is applied to the subjects.
- a) observational
 - b) experimental
 - c) retrospective
 - d) prospective
22. A technique where the subjects do not know whether they received the treatment or placebo is known as _____.
- a) lurking
 - b) observing
 - c) double-blinding
 - d) blinding
23. A technique where neither the subjects nor the experimenter(s) know which subjects received the treatment or placebo is known as _____.
- a) blinding
 - b) lurking
 - c) observing
 - d) double-blinding



24. A table listing the possibilities of the variable of interest obtained from the sample along with their corresponding frequencies is called a _____.
- a) pie chart
 - b) stem and leaf plot
 - c) frequency distribution
 - d) discrete probability distribution
25. A graph with rectangular bars in which the height of each bar is equal to the frequency of a corresponding category is known as a _____.
- a) stem and leaf plot
 - b) bar graph
 - c) scatterplot
 - d) pie chart
26. A _____ is a circle divided into sectors in which the sectors are directly proportional to the frequency of the categories they represent.
- a) bar graph
 - b) histogram
 - c) stem and leaf plot
 - d) pie chart
27. The _____ is the frequency of each category divided by the sample size (n).
- a) fractional frequency
 - b) partial frequency
 - c) relative frequency
 - d) overall frequency



28. A _____ is a graph used to summarize grouped data by using adjacent rectangular bars in which the height of each bar is equal to the frequency of each class.
- a) bar graph
 - b) pie chart
 - c) histogram
 - d) stem and leaf plot
29. A _____ is a graph in which each data value is split into a stem and a leaf.
- a) stem and leaf plot
 - b) pie chart
 - c) histogram
 - d) bar graph
30. A numerical summary gathered from a population is known as a _____.
- a) population
 - b) sample
 - c) parameter
 - d) statistic
31. A numerical summary gathered from a sample is known as a _____.
- a) parameter
 - b) statistic
 - c) population
 - d) sample



32. A value that is calculated by summing the values of the observations, then dividing by the total number of observations is called the _____.
- a) midrange
 - b) median
 - c) mode
 - d) mean
33. The _____ is a value that lies in the middle of the data set. It divides the data set into two equal parts.
- a) mean
 - b) mode
 - c) median
 - d) midrange
34. The _____ is the most frequently occurring observation.
- a) mean
 - b) mode
 - c) midrange
 - d) median
35. In a _____ distribution, the mean is equal to the median.
- a) symmetrical
 - b) skewed right
 - c) skewed left
 - d) j-shaped



36. In a skewed right distribution, the mean is _____
the median.
- a) the same as
 - b) greater than
 - c) less than
 - d) equal to
37. In a skewed left distribution, the mean is _____
the median.
- a) equal to
 - b) the same as
 - c) greater than
 - d) less than
38. For symmetrical distributions, it is best to report the
_____.
- a) mean
 - b) median
 - c) mode
 - d) midrange
39. For skewed distributions, it is best to report the
_____.
- a) midrange
 - b) mean
 - c) median
 - d) mode



40. For qualitative data, the _____ is the preferred measure of central tendency.
- a) mean
 - b) mode
 - c) median
 - d) midrange
41. The _____ is a value that is determined by taking the difference between the largest value (Maximum) and the smallest value (Minimum).
- a) range
 - b) mean
 - c) variance
 - d) quartile
42. The _____ is a value that is the average of the squares of the deviations from the mean of a data set.
- a) percentile
 - b) quartile
 - c) standard deviation
 - d) variance
43. The _____ is a value that is the square root of the variance.
- a) quartile
 - b) z-score
 - c) standard deviation
 - d) mode



44. According to the Empirical Rule, about _____ of the observations lie within 1 standard deviation of the mean.
- a) 68%
 - b) 89%
 - c) 75%
 - d) 95%
45. According to the Empirical Rule, about _____ of the observations lie within 2 standard deviations of the mean.
- a) 99%
 - b) 98%
 - c) 95%
 - d) 90%
46. According to the Empirical Rule, about 99.7% of the observations lie within _____ standard deviations of the mean.
- a) 0.1
 - b) 1
 - c) 2
 - d) 3
47. A value that represents the number of standard deviations an observation is away from the mean is known as a _____.
- a) quartile
 - b) z-score
 - c) median
 - d) percentile



48. _____ are specific percentiles that divide the data set into 4 parts.
- a) Z-scores
 - b) Quartiles
 - c) Boxplots
 - d) Histograms
49. The _____ quartile (Q_1) is known as the 25th percentile.
- a) tenth
 - b) hundredth
 - c) first
 - d) second
50. The _____ quartile (Q_2) is known as the 50th percentile.
- a) third
 - b) first
 - c) fourth
 - d) second
51. The _____ quartile (Q_3) is known as the 75th percentile.
- a) third
 - b) second
 - c) first
 - d) fourth



52. A graphical representation of data using the five-number summary is known as a _____.
- a) histogram
 - b) bar graph
 - c) boxplot
 - d) pie chart
53. The _____ is a summary that consists of the minimum value, the first quartile (Q_1), the median (Med), the third quartile (Q_3) and the maximum value.
- a) test statistic
 - b) critical value
 - c) empirical rule
 - d) five-number summary
54. The _____ is the difference between the third quartile (Q_3) and the first quartile (Q_1).
- a) standard deviation
 - b) interquartile range
 - c) z-score
 - d) median
55. Summary statistics that are not affected by outliers are said to be _____.
- a) nonresistant
 - b) parameters
 - c) perfect
 - d) resistant



56. Summary statistics that are affected by outliers are said to be _____.
- a) variant
 - b) resistant
 - c) nonresistant
 - d) the same as the mean
57. The likelihood of an event occurring is called a(n) _____.
- a) probability
 - b) sample space
 - c) event
 - d) outcome
58. A subset of the sample space is known as a(n) _____.
- a) event
 - b) probability
 - c) sample space
 - d) experiment
59. The _____ is the set of all possible outcomes.
- a) sample space
 - b) event
 - c) outcome
 - d) probability



60. Events that do not have any outcomes in common are considered _____.
- a) non-mutually exclusive
 - b) central
 - c) mutually exclusive
 - d) large
61. _____ events are events in which the probability of the second event is not affected by the probability of the first event.
- a) Mutually exclusive
 - b) Non-mutually exclusive
 - c) Dependent
 - d) Independent
62. _____ events are events in which the probability of the second event is affected by the probability of the first event.
- a) Complementary
 - b) Exclusive
 - c) Independent
 - d) Dependent
63. _____ probability is the probability of the second event occurring given that the first event has already occurred.
- a) Conditional
 - b) Complementary
 - c) Uniform
 - d) Permutations



64. A counting rule that is applied when the first event can occur in k ways, the second event can occur in l ways, the third event can occur in m ways, and so on is known as the _____ rule.
- a) classical
 - b) empirical
 - c) fundamental counting
 - d) complementary
65. A counting rule that is applied when n distinct objects can be ordered in different ways is known as the _____ rule.
- a) test of independence
 - b) factorial
 - c) critical
 - d) statistical
66. A counting rule that is applied when r distinct objects are selected from n objects in which order of objects is important is called the _____ rule.
- a) classical
 - b) combinations
 - c) empirical
 - d) permutations
67. A counting rule that is applied when r distinct objects are selected from n objects is known as the _____ rule.
- a) permutations
 - b) regression
 - c) combinations
 - d) mutually exclusive



68. A variable whose values are determined by random variations is called a _____ variable.
- a) typical
 - b) complementary
 - c) random
 - d) matching
69. _____ random variables are variables that have countable values.
- a) Bivariate
 - b) Continuous
 - c) Disjoint
 - d) Discrete
70. _____ random variables are variables that have measurable values.
- a) Continuous
 - b) Matching
 - c) Discrete
 - d) Active
71. A discrete probability _____ is a table that lists all outcomes of the discrete random variable along with their corresponding probabilities.
- a) dissemination
 - b) distribution
 - c) dictionary
 - d) diffusion



72. A _____ distribution is a normal distribution with a mean of 0 and a standard deviation of 1.
- standard normal
 - skewed left
 - skewed right
 - average
73. The _____ is a table of cumulative probabilities used to determine probabilities for normal distributions that have been standardized.
- frequency table
 - binomial distribution
 - Standard Normal Table
 - discrete probability
74. The Central Limit Theorem: as the sample size increases, typically $n \geq 30$, the sampling distribution of the sample mean becomes approximately _____, regardless of the shape of the population's distribution.
- normal
 - uniform
 - skewed right
 - skewed left
75. An interval estimate for a population parameter with a level of confidence is called a _____.
- class interval
 - course interval
 - confidence interval
 - coordinated interval



76. The percentage of constructed confidence intervals that contain the true population parameter in repeated sampling is known as the _____.
- a) level of significance
 - b) level of confidence
 - c) classical probability
 - d) conditional probability
77. Which of the following is not a common confidence level?
- a) 40%
 - b) 95%
 - c) 90%
 - d) 99%
78. Error, also known as _____, is the distance between the point estimate and the population parameter.
- a) standard error
 - b) margin of error
 - c) minimal error
 - d) continuous error
79. What z critical value would be used to create a 99% confidence interval?
- a) 1.96
 - b) 2.33
 - c) 1.645
 - d) 2.575



80. What z critical value would be used to create a 95% confidence interval?
- a) 1.96
 - b) 2.575
 - c) 3.29
 - d) 2.33
81. What z critical value would be used to create a 90% confidence interval?
- a) 2.33
 - b) 1.96
 - c) 1.645
 - d) 2.575
82. To make inferences about a population mean, the sample _____ is used.
- a) proportion
 - b) mean
 - c) standard deviation
 - d) variance
83. To make inferences about a population proportion, the sample _____ is used.
- a) mean
 - b) variance
 - c) standard deviation
 - d) proportion



84. A procedure that uses sample data to test whether a hypothesis about the value of a population parameter is true is called _____.
- a) hypothesis testing
 - b) testing thoughts
 - c) assumption testing
 - d) guessing thoughts
85. In hypothesis testing, the _____ is a hypothesis about the value of a population parameter, which is assumed to be true.
- a) test statistic
 - b) critical value
 - c) conclusion
 - d) null hypothesis
86. In hypothesis testing, the _____ is an alternative hypothesis about the value of a population parameter.
- a) null hypothesis
 - b) decision
 - c) alternative hypothesis
 - d) test statistic
87. In hypothesis testing, the _____ is the probability of rejecting the null hypothesis when it is true.
- a) level of significance
 - b) null hypothesis
 - c) critical value
 - d) decision



88. In hypothesis testing, the _____ is a numerical summary calculated from sample data.
- a) decision
 - b) conclusion
 - c) test statistic
 - d) null hypothesis
89. In hypothesis testing, the _____ is a value created based on the level of significance and type of test (e.g. left-tailed test, right-tailed test, two-tailed test). The value is used as the boundary for the rejection region.
- a) test statistic
 - b) level of significance
 - c) decision
 - d) critical value
90. In hypothesis testing, the probability of observing the test statistic as extreme or more extreme as the one observed from the sample data, assuming the null hypothesis is true is known as the _____.
- a) critical value
 - b) p-value
 - c) decision
 - d) conclusion
91. In hypothesis testing, a _____ is made in regards to rejecting or not rejecting the null hypothesis.
- a) null hypothesis
 - b) decision
 - c) critical value
 - d) alternative hypothesis



92. The _____ is a summary statement of the results of a hypothesis test.
- a) alternative hypothesis
 - b) conclusion
 - c) test statistic
 - d) level of significance
93. _____ error occurs when the null hypothesis is rejected when in fact it is true.
- a) Type III
 - b) Negative
 - c) Type I
 - d) 100%
94. _____ occurs when the null hypothesis is not rejected when in fact it is false.
- a) Type I error
 - b) Type IV error
 - c) Type III error
 - d) Type II error
95. Two samples are said to be _____ if the subjects in group 1 are completely different from the subjects in group 2.
- a) independent
 - b) dependent
 - c) similar
 - d) comparable



96. Two samples are said to be _____ if the subjects in group 1 and group 2 are the same subjects, have a relationship (e.g. twins, siblings, married couples), or have been matched for specific characteristics.
- a) different
 - b) independent
 - c) dependent
 - d) changed
97. A graphical representation that shows the relationship between two quantitative variables is known as a _____.
- a) boxplot
 - b) stem and leaf plot
 - c) histogram
 - d) scatterplot
98. The _____ is a value that represents the strength and direction of the linear relationship between two quantitative variables.
- a) correlation coefficient
 - b) test statistic
 - c) critical value
 - d) statistical value
99. A _____ is an extraneous variable (a variable not included in the experiment) that adversely affects the relationship between the explanatory variable and response variable.
- a) causal variable
 - b) correlated variable
 - c) lurking variable
 - d) unclear variable



100. A process used to develop an equation based on the relationship between quantitative variables is known as _____.
- a) regression analysis
 - b) causation analysis
 - c) examination analysis
 - d) investigation analysis
101. A line for which the sum of the squared residuals is as small as possible is known as a _____.
- a) least-squares regression line
 - b) unassociated line
 - c) residual line
 - d) lurking line
102. _____ is a practice in which one uses x-values that are beyond the range of the observed x-values of the data set to make predictions.
- a) Correlation
 - b) Regression
 - c) Hypothesis testing
 - d) Extrapolation
103. The _____ is the standard deviation of the observed y-values about the predicted y-value for a specific x-value.
- a) standard difference of predicted values
 - b) standard error of estimate
 - c) standard sum of predicted values
 - d) standard error of deviations



104. A _____ is a table of rows and columns that shows the observed counts of data. The categories of one qualitative variable are represented via the rows and the categories of the other qualitative variable are represented via the columns.
- a) frequency table
 - b) relative frequency table
 - c) contingency table
 - d) likewise table
105. A(n) _____ is a statistical procedure used to compare the means of three or more independent populations.
- a) z-test
 - b) t-test
 - c) chi-square test
 - d) ANOVA



Answers

1. All of the above
2. Analyzing data
3. All of the above
4. Research question
5. Population
6. Sample
7. Equal
8. Stratified
9. Cluster
10. Systematic
11. Convenience
12. Nonresponse
13. Response
14. Undercoverage
15. Variable of interest
16. Qualitative
17. Quantitative
18. Discrete
19. Continuous
20. A research question
21. Experimental
22. Blinding
23. Double-blinding
24. Frequency distribution
25. Bar graph
26. Pie chart
27. Relative frequency
28. Histogram
29. Stem and leaf plot
30. Parameter
31. Statistic
32. Mean
33. Median
34. Mode
35. Symmetrical
36. Greater than



37. Less than
38. Mean
39. Median
40. Mode
41. Range
42. Variance
43. Standard deviation
44. 68%
45. 95%
46. 3
47. Z-score
48. Quartiles
49. First
50. Second
51. Third
52. Boxplot
53. Five-number summary
54. Interquartile range
55. Resistant
56. Nonresistant
57. Probability
58. Event
59. Sample space
60. Mutually exclusive
61. Independent
62. Dependent
63. Conditional
64. Fundamental counting
65. Factorial
66. Permutations
67. Combinations
68. Random
69. Discrete
70. Continuous
71. Distribution
72. Standard normal
73. Standard Normal Table
74. Normal



75. Confidence interval
76. Level of confidence
77. 40%
78. Margin of error
79. 2.575
80. 1.96
81. 1.645
82. Mean
83. Proportion
84. Hypothesis testing
85. Null hypothesis
86. Alternative hypothesis
87. Level of significance
88. Test statistic
89. Critical value
90. P-value
91. Decision
92. Conclusion
93. Type I
94. Type II error
95. Independent
96. Dependent
97. Scatterplot
98. Correlation coefficient
99. Lurking variable
100. Regression analysis
101. Least-squares regression line
102. Extrapolation
103. Standard error of estimate
104. Contingency table
105. ANOVA

