Fall 2010 Practice Exam 1 Without Essay

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

___ 1. A researcher wants to visually display the U.S. divorce rate (an interval-ratio level variable) for the last 50 years. An appropriate format would be
   a. a line chart or histogram
   b. only a histogram would work in this situation
   c. a pie chart
   d. none of the above. Data in the form of rate should never be displayed in a chart or graph.

___ 2. Which of the following sampling methods is not an example of a random sampling method?
   a. Capture-Recapture
   b. Systematic
   c. Convenience
   d. Cluster

___ 3. In the language of science, a variable that is thought to be causal is called
   a. an independent variable
   b. a hypothetical variable
   c. a primary variable
   d. a dependent variable

___ 4. In time, the ___ variable precedes the ___ variable.
   a. hypothetical, theoretical
   b. theoretical, quantitative
   c. independent, dependent
   d. dependent, independent

___ 5. In terms of the "Great Wheel of Science", statistics are central to the research process
   a. only between the theory phase and the hypothesis phase
   b. only between the hypothesis phase and the observation phase
   c. only between the observation phase and the empirical generalization phase
   d. only between the empirical generalization phase and the theory phase

___ 6. Choose the nominal level variable below:
   a. size of family unit
   b. eye color of students in statistics class
   c. speed of travel of a jet
   d. your weight

___ 7. Variables measured at the ordinal level are limited to which of the following mathematical operations?
   a. addition and subtraction
   b. multiplication
   c. ranking cases as higher or lower, more or less
   d. counting the number of cases per category

___ 8. When using interval-ratio data, the distance between the scores is
   a. always two units
   b. unequal
   c. exactly defined
   d. not always clear
9. Select the variable(s) that can be measured at the interval-ratio level
   a. different types of crimes
   b. number of children in a family
   c. attractiveness of a person
   d. emotional stability

10. Computation of a mean (or average) is completely justified when a variable is measured at which level?
    a. interval-ratio
    b. ordinal
    c. nominal
    d. all of the above

11. To calculate a proportion, the number of cases in any category (f) is divided by
    a. the total number of categories (k)
    b. the number of cases in all categories (N)
    c. the cases in that category (f)
    d. the number of cases in adjacent categories (k-1)

12. Which of the following is an impossible value for a percentage?
    a. 0%
    b. 47.458923%
    c. 110.00%
    d. 0.05%

13. The ratio of men to women in a karate class is 3.3:1. If there are 100 women, how many men are there?
    a. 33
    b. 66
    c. 133
    d. 330

Table 2.1

<table>
<thead>
<tr>
<th>PARTY</th>
<th>COMMUNITY A</th>
<th>COMMUNITY B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Republican</td>
<td>103</td>
<td>17</td>
</tr>
<tr>
<td>Democrat</td>
<td>135</td>
<td>21</td>
</tr>
<tr>
<td>Independent</td>
<td>17</td>
<td>15</td>
</tr>
<tr>
<td>Socialist</td>
<td>9</td>
<td>11</td>
</tr>
<tr>
<td>TOTALS:</td>
<td>264</td>
<td>64</td>
</tr>
</tbody>
</table>

14. In Table 2.1, what percentage of Community A are Republicans?
    a. \( \frac{103}{264} \times 100 = 39.02 \%
    b. \( \frac{103}{17} \times 100 = 605.88 \%
    c. \( \frac{264}{328} \times 100 = 80.49 \%
    d. \( \frac{103}{135} \times 100 = 76.30 \%

15. In Table 2.1, what is the ratio of Socialists to Democrats in Community B?
    a. 11:21
    b. 11:64
    c. 64:11
    d. 9:11
16. In Table 2.1, which is the correct fraction for determining the proportion of Independents in community B?
   a. 15 / 17
   b. 15 / 264
   c. 64 / 15
   d. 15 / 64

17. In Table 2.1, which community has the higher proportion of Independents?
   a. Community A
   b. Community B
   c. Neither
   d. This proportion can't be determined from the information given.

18. In Table 2.1, what percentage of Democrats lives in community B?
   a. \((21 / 64) \times 100 = 32.8\)
   b. \((21 / 328) \times 100 = 6.4\)
   c. \((21 / 156) \times 100 = 13.5\)
   d. \((64 / 264) \times 100 = 24.2\)

19. A police department reports that the number of reported rapes in their jurisdiction increased by 100% over the past decade. This means that the number of reported rapes today is
   a. double the number 10 years ago
   b. actually about the same as 10 years ago
   c. equal to the number 10 years ago plus 50%
   d. triple the number 10 years ago

20. When constructing a frequency distribution for an interval-ratio level variable, the number of class intervals, in general, should be
   a. more than 20
   b. about 10
   c. only 2
   d. the same as the number of cases

21. Pie charts show the frequency distribution of
   a. one variable
   b. two variables
   c. three or more variables
   d. any of the above

22. For a single variable at the interval-ratio level, an appropriate graph would be
   a. a pie chart
   b. a histogram
   c. a bivariate table
   d. none of the above. Graphs are never used for interval-ratio level variables

23. The purpose of measures of central tendency is to describe what value of a distribution of scores is
   a. the most typical or representative
   b. the most surprising or unexpected
   c. the most significant or important
   d. all of the above
24. What measure of central tendency would be most appropriate to summarize data about the color of movie star's eyes?
   a. median
   b. mode
   c. mean
   d. none of the above

25. It is possible for a variable to have
   a. one mode
   b. many modes
   c. no mode
   d. all of the above

26. The median defines "central tendency" in terms of the
   a. most common score
   b. central case
   c. most likely or probable score
   d. largest score

27. If the scores of an even number of cases are arranged from high to low, the median is
   a. the middle score
   b. the average of the two middle scores
   c. the average of the highest and lowest scores
   d. the same as the mode

28. If the scores on a variable are 11, 14, 18, 19, 20, and 25, the median is
   a. 3
   b. 18
   c. 18.5
   d. 19

29. Which measure of central tendency is like "a fulcrum that exactly balances all of the scores"?
   a. mode
   b. median
   c. mean
   d. none of the above

30. In a positively skewed distribution the mean is
   a. equal in value to the median
   b. greater in value than the median
   c. less in value than the median
   d. either a or b, depending on the value of the mode

31. An instructor is preparing a report showing mid-semester grades and notes that the mean, median, and mode are all exactly 76.00. What can he conclude?
   a. The distribution of grades is unskewed
   b. There is a negative skew in the distribution (a few students have very low grades)
   c. There is a positive skew in the distribution (a few students have very high grades)
   d. all of the above

32. Measures of dispersion provide an indication of the
   a. typical or most common score
   b. variety within the distribution of scores
   c. size of the sample
   d. adequacy of the selection criteria for the sample
33. One problem with the range (R) as a measure of dispersion is that it
   a. is very difficult to calculate
   b. ignores the most extreme scores
   c. can be used only for nominal level variables
   d. is based on only the most extreme scores

34. The second quartile (Q₂) is equal in value to
   a. the mode
   b. the median
   c. the mean
   d. the range

35. Your score on a test is the same as the third quartile (Q₃). You may conclude that
   a. you scored higher than 75% of the people who took the test
   b. the distribution of the scores is skewed
   c. your score is 'typical' since it is the same value as the median
   d. you scored higher than 25% of the people who took the test

36. Since computation of the standard deviation requires addition, division, and other mathematical operations, it
   should be used for
   a. interval-ratio level variables
   b. variables at any level of measurement
   c. nominal level variables
   d. ordinal level variables only

37. If you calculated the standard deviation for a distribution of 20 scores, removed the 5 highest scores and
   recalculated, the value of the standard deviation would
   a. increase
   b. stay the same
   c. decrease
   d. be reduced by five

38. Four students have applied to a special program and only one can be accepted. They have taken a battery of
   12 tests and all four students have exactly the same average score. The standard deviation of their test scores
   are: Student A = 3.12, Student B = 0.27, Student C = 13.45, Student D = 6.45. If consistency of performance
   is a criteria for acceptance, which of the four students should be selected?
   a. A
   b. B
   c. C
   d. D
Short Response

39. Survey respondents were asked if they agree with the statement “The government should fund scientific research” The responses are summarized below. Is this an example of consensus, discensus or polarization? Justify your response in 2-3 sentences.

<table>
<thead>
<tr>
<th>Response</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Agree</td>
<td>21</td>
</tr>
<tr>
<td>Agree</td>
<td>22</td>
</tr>
<tr>
<td>Neither Agree nor Disagree</td>
<td>19</td>
</tr>
<tr>
<td>Disagree</td>
<td>19</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>19</td>
</tr>
</tbody>
</table>

40. Explain how multiplicity estimation can be used to estimate the size of the homeless population in the United States Census.
41. Critique the following graph. Provide at least two criticisms.
42. Below are some items from a survey. For each item, identify the level of measurement and explain your reasoning.

a. In what region of the country were you born?
   - South
   - Northeast
   - Midwest
   - Far West
   - Other
   - Born out of Country

b. How many siblings do you have? _____

c. How satisfied are you with the quality of instruction at this institution?
   - Very satisfied
   - Satisfied
   - Dissatisfied
   - Very Dissatisfied

d. How many miles per gallon does your car average? _____

e. People convicted of first degree murder should be executed.
   - Strongly Agree
   - Agree
   - Neither Agree nor Disagree
   - Disagree
   - Strongly Disagree

43. The frequency distribution below displays the distribution of age for a sample drawn from a community. Finish the table by completing the columns for percentages, and cumulative percentages.

<table>
<thead>
<tr>
<th>AGE</th>
<th>Cumulative Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class Intervals</td>
<td>Frequency</td>
</tr>
<tr>
<td>10 – 19</td>
<td>9</td>
</tr>
<tr>
<td>20 – 29</td>
<td>17</td>
</tr>
<tr>
<td>30 – 39</td>
<td>45</td>
</tr>
<tr>
<td>40 – 49</td>
<td>56</td>
</tr>
<tr>
<td>50 – 60</td>
<td>23</td>
</tr>
<tr>
<td>60 – 69</td>
<td>10</td>
</tr>
<tr>
<td>70 – 79</td>
<td>8</td>
</tr>
<tr>
<td>TOTALS</td>
<td></td>
</tr>
</tbody>
</table>
Problem

44. The scores below are from the same final exam given in a math class in two different years (see problem #1 at the end of Chapter 3 in this manual). Compute the mean and median (if necessary) and the range and standard deviation of these scores. Using these statistics, describe the differences in the two sets of scores.

<table>
<thead>
<tr>
<th>This year</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>35</td>
<td>45</td>
<td>65</td>
<td>75</td>
<td>87</td>
</tr>
<tr>
<td>80</td>
<td>69</td>
<td>71</td>
<td>53</td>
<td>90</td>
</tr>
<tr>
<td>99</td>
<td>95</td>
<td>70</td>
<td>82</td>
<td>73</td>
</tr>
<tr>
<td>93</td>
<td>67</td>
<td>61</td>
<td>57</td>
<td>74</td>
</tr>
<tr>
<td>72</td>
<td>77</td>
<td>71</td>
<td>81</td>
<td>83</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ten years ago</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>56</td>
<td>77</td>
<td>75</td>
<td>76</td>
<td>59</td>
</tr>
<tr>
<td>74</td>
<td>51</td>
<td>89</td>
<td>55</td>
<td>79</td>
</tr>
<tr>
<td>67</td>
<td>77</td>
<td>69</td>
<td>90</td>
<td>68</td>
</tr>
<tr>
<td>90</td>
<td>65</td>
<td>79</td>
<td>69</td>
<td>79</td>
</tr>
<tr>
<td>87</td>
<td>86</td>
<td>98</td>
<td>91</td>
<td>95</td>
</tr>
</tbody>
</table>
Fall 2010 Practice Exam 1 Without Essay
Answer Section

MULTIPLE CHOICE

1. ANS: A  PTS: 1  REF:  p. 47
2. ANS: C  PTS: 1
3. ANS: A  PTS: 1  REF:  p. 10
4. ANS: C  PTS: 1  REF:  p. 10
5. ANS: C  PTS: 1  REF:  p. 11
6. ANS: B  PTS: 1  REF:  p. 16-17
7. ANS: C  PTS: 1  REF:  p. 18
8. ANS: C  PTS: 1  REF:  p. 19-20
9. ANS: B  PTS: 1  REF:  p. 19-20
10. ANS: A  PTS: 1  REF:  p. 21
11. ANS: B  PTS: 1  REF:  p. 28
12. ANS: C  PTS: 1  REF:  p. 28-29
13. ANS: D  PTS: 1  REF:  p. 31-32
14. ANS: A  PTS: 1  REF:  p. 28-29
15. ANS: A  PTS: 1  REF:  p. 31-32
16. ANS: D  PTS: 1  REF:  p. 28-29
17. ANS: B  PTS: 1  REF:  p. 28-29
18. ANS: C  PTS: 1  REF:  p. 28-29
19. ANS: A  PTS: 1  REF:  p. 32-34
20. ANS: B  PTS: 1  REF:  p. 45
21. ANS: A  PTS: 1  REF:  p. 48
22. ANS: B  PTS: 1  REF:  p. 47
23. ANS: A  PTS: 1  REF:  p. 65
24. ANS: B  PTS: 1  REF:  p. 66
25. ANS: D  PTS: 1  REF:  p. 66
26. ANS: B  PTS: 1  REF:  p. 67
27. ANS: B  PTS: 1  REF:  p. 68
28. ANS: C  PTS: 1  REF:  p. 67-68
29. ANS: C  PTS: 1  REF:  p. 71
30. ANS: B  PTS: 1  REF:  p. 73
31. ANS: A  PTS: 1  REF:  p. 73
32. ANS: B  PTS: 1  REF:  p. 85
33. ANS: D  PTS: 1  REF:  p. 86
34. ANS: B  PTS: 1  REF:  p. 86
35. ANS: A  PTS: 1  REF:  p. 86
36. ANS: A  PTS: 1  REF:  p. 89
37. ANS: C  PTS: 1  REF:  p. 94-95
38. ANS: B  PTS: 1  REF:  p. 94-95
ESSAY

39. ANS:
polarization

PTS: 1

40. ANS:
sdf

PTS: 1

41. ANS:
chart type and difficult to see differences

PTS: 1

42. ANS:

a. Nominal
b. Interval-ratio
c. Ordinal
d. Interval-ratio
e. Ordinal

PTS: 1 OBJ: Essay Questions

43. ANS:

<table>
<thead>
<tr>
<th>Class Intervals</th>
<th>Frequency</th>
<th>Percentage</th>
<th>Cumulative Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 – 19</td>
<td>9</td>
<td>5.36</td>
<td>5.36</td>
</tr>
<tr>
<td>20 – 29</td>
<td>17</td>
<td>10.12</td>
<td>15.48</td>
</tr>
<tr>
<td>30 – 39</td>
<td>45</td>
<td>26.79</td>
<td>42.27</td>
</tr>
<tr>
<td>40 – 49</td>
<td>56</td>
<td>33.33</td>
<td>75.60</td>
</tr>
<tr>
<td>50 – 60</td>
<td>23</td>
<td>13.69</td>
<td>89.29</td>
</tr>
<tr>
<td>60 – 69</td>
<td>10</td>
<td>5.95</td>
<td>95.24</td>
</tr>
<tr>
<td>70 – 79</td>
<td>8</td>
<td>4.76</td>
<td>100.00</td>
</tr>
<tr>
<td>TOTALS</td>
<td>168</td>
<td>100.00</td>
<td></td>
</tr>
</tbody>
</table>

PTS: 1 OBJ: Problems and Essay Questions
PROBLEM

44. ANS:

<table>
<thead>
<tr>
<th>This year:</th>
<th>Ten years ago:</th>
</tr>
</thead>
<tbody>
<tr>
<td>s = 14.86</td>
<td>s = 12.66</td>
</tr>
<tr>
<td>Range = 64</td>
<td>Range = 47</td>
</tr>
</tbody>
</table>

PTS: 1   OBJ: Problems