Test Bank for Essentials of Statistics for Criminology and Criminal Justice 1st Paternoster

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Test Bank

Chapter 2: Understanding Data Distributions with Tables and Graphs

Multiple Choice

1. Which of the following would best depict nominal level data?
a. pie chart
b. line graph
c. histogram
d. polygon
Ans: A
Answer Location: The Tabular and Graphical Display of Qualitative Data: Pie and Bar Charts Cognitive Domain: Comprehension

2. If you ask individuals about the number of times they have been a victim of a serious crime, you would use a _____ to illustrate the data collected for this variable.
a. frequency polygon
b. histogram
c. pie chart
d. bar chart
Ans: B
Answer Location: The Tabular and Graphical Display of Quantitative Data: Histogram
Cognitive Domain: Application

3. A researcher using a measure at the ratio level would use a _____ to illustrate the data.
a. histogram
b. bar chart
c. polygon
d. pie chart
Ans: C Answer Location: The Tabular and Graphical Display of Quantitative Data: Line Graphs or Polygons
Comprehension: Application

4. _____ groups the values of an interval or ratio level variable into a smaller number of intervals and illustrates the frequencies and percentages for the groups.
a. Frequency distribution
b. Grouped frequency distribution
c. Cumulative distribution
d. Cumulative frequency distribution
Ans: B
Answer Location: The Tabular and Graphical Display of Quantitative Data: Grouped Frequency Distributions
Cognitive Domain: Knowledge

5. A value of a variable that is halfway between the top of an interval and the bottom of the next interval is _____.
a. grouped frequency distribution
b. the real lower limit
c. the real upper limit

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d. the real limit
Ans: D Answer Location: The Tabular and Graphical Display of Quantitative Data: Refinements to a Grouped Frequency Distribution
Cognitive Domain: Knowledge

6. Given the following grouped distribution, what would the real upper limit be for the group of 6–8?

Class Limits	*f*	%
0–2	15	31.25
3–5	12	25
6–8	8	16.67
9–11	7	14.58
12–14	4	8.33
15 and higher	2	4.12
Total N	48	

a. 8.0
b. 8.05
c. 8.49
d. 8.5
Ans: D
Answer Location: The Tabular and Graphical Display of Quantitative Data: Refinements to a Grouped Frequency Distribution
Cognitive Domain: Analysis

7. Using the following frequency distribution, what are the real class limits for the group 11–15?

Class Limits	*f*
0–5	45
6–10	36
11–15	15
16–20	25
21–25	18
26–30	19
31–35	10
36–40	8

a. 10.9–15.5
b. 10.5–15.05
c. 10.5–15.4
d. 10.5–15.5
Ans: D
Answer Location: The Tabular and Graphical Display of Quantitative Data: Refinements to a Grouped Frequency Distribution
Cognitive Domain: Comprehension

8. After grading the midterm exam, the professors realize that the test was much easier than originally thought. The professors reach the conclusion that the shape of the distribution is _____.
a. normal
b. flat
c. positively skewed
d. negatively skewed
Ans: D
Answer Location: The Shape of a Distribution

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Cognitive Domain: Application

9. After conducting a literacy test on inmates, the evaluator realizes that the test was much more difficult than expected. The shape of the distribution would be _____.
a. normal
b. positively skewed
c. negatively skewed
d. bell-shaped
Ans: B
Answer Location: The Shape of a Distribution
Cognitive Domain: Application

10. Given the following data, which age group had the largest percentage change in the hypothetical victimization rate?

Age Group	Victimization Rate, 2000	Victimization Rate, 2010
15–24	202.36	256.98
25–34	356.20	401.56
35–44	290.12	310.26
45–54	200.15	226.35
55–64	145.65	132.25
65 and older	123.36	119.66

a. 15–24
b. 25–34
c. 35–44
b. 45–54
Ans: A
Answer Location: Time Plots
Cognitive Domain: Application

True/False

1. A researcher would use a pie chart to illustrate data for a variable measured at the interval level.
Ans: F
Answer Location: The Tabular and Graphical Display of Qualitative Data: Pie and Bar Charts Cognitive Domain: Knowledge

2. Bar charts are best used for nominal and ordinal level data.
Ans: T
Answer Location: The Tabular and Graphical Display of Qualitative Data: Pie and Bar Charts
Cognitive Domain: Knowledge

3. A researcher would use a histogram to illustrate data for the variable “number of violent crimes committed.”
Ans: T
Answer Location: The Tabular and Graphical Display of Quantitative Data: Histograms
Cognitive Domain: Comprehension

4. A grouped frequency distribution groups the values of an interval or ratio level measurement into smaller numbers of intervals.
Ans: T

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Answer Location: The Tabular and Graphical Display of Quantitative Data: Grouped Frequency Distributions
Cognitive Domain: Knowledge

5. Class intervals must be mutually exclusive and exhaustive.
Ans: T

Answer Location: The Tabular and Graphical Display of Quantitative Data: Grouped Frequency Distributions
Cognitive Domain: Knowledge

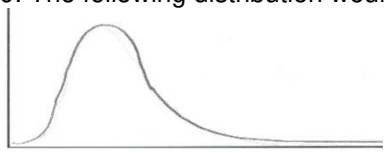
6. If a researcher was working with an interval level measure to create a grouped frequency distribution with equal intervals and that variable has 25 different values, the researcher would create six different intervals.
Ans: F
Answer Location: The Tabular and Graphical Display of Quantitative Data: Grouped Frequency Distributions
Cognitive Domain: Analysis

7. A variable that is measured at the ordinal level can be grouped into a small number of intervals in a grouped frequency distribution.
Ans: F
Answer Location: The Tabular and Graphical Display of Quantitative Data: Grouped Frequency Distributions
Cognitive Domain: Comprehension

8. The largest value of a variable that is grouped into a particular interval would be the real lower limit.
Ans: F

Answer Location: The Tabular and Graphical Display of Quantitative Data: Refinements to a Grouped Frequency Distribution
Cognitive Domain: Comprehension

9. The following distribution would be described as a normal distribution.



Ans: F

Answer Location: The Shape of a Distribution
Cognitive Domain: Comprehension

10. A negatively skewed distribution has outliers at the left tail of the distribution.
Ans: F

Answer Location: The Shape of a Distribution
Cognitive Domain: Comprehension

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Short Answer

1. Complete the following table:

Number of Victimizations	*f*	*cf*	%	*c*%
0–1	22			
2–3	53			
4–5	20			
6–7	15			
8–9	18			
10–11	7			

Ans:

Number of Victimizations	*f*	*cf*	%	*c*%
0–1	22	22	16.3	16.3
2–3	53	75	39.3	55.6
4–5	20	95	14.8	70.4
6–7	15	110	11.1	81.5
8–9	18	128	13.3	94.8
10–11	7	135	5.2	100

Answer Location: The Tabular and Graphical Display of Quantitative Data
Cognitive Domain: Application

2. Given the following data, create a grouped frequency distribution and state the real class limits of each interval.

Score	*f*
0	5
1	2
2	9
3	3
4	5
5	4
6	9
7	3
8	3
9	8
10	4
11	5
12	6

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13	4
14	7

Ans: Grouped Frequency Distribution

Class Interval	Real Class Limits	Frequency
0–4	0–4.5	24
5–9	4.5–9.5	27
10–14	9.5–14.5	26

Answer Location: The Tabular and Graphical Display of Quantitative Data: Grouped Frequency Distribution
Cognitive Domain: Application

3. What are time plots and when are they useful to use in research?
Ans: Answers may vary.
A time plot is simply a graphical display of a variable's values over some unit of time (year, month, week, etc.). It is actually a type of line graph where the height of the line on the *y* axis reflects some attribute of the value (a frequency or a percent) and its length is marked off in units of time on the *x* axis. In such a time plot, we can easily determine the value of the variable at any given point in time. They are very useful when studying some phenomenon's change over time.
Answer Location: Time Plots
Cognitive Domain: Application

Essay

1. Discuss the different types of graphical representations (pie charts, bar charts, histograms, and polygons). What are the levels of measurement that can be used with each type of graphical representation?
Ans: Answers may vary
A *pie chart* consists of a round "pie" shape divided into parts, or "slices," where each slice represents a separate value of the variable. The size of each slice of the pie is proportionate to the frequency (or proportion or percentage of the total) for each value; that is, the greater the contribution that a given value makes to the total number of observations, the larger the slice of the pie for that value. The total area of the pie chart should equal the number of observations if you are graphing the frequencies: 1.0 if you are graphing proportions and 100 if you are graphing percentages. These are best used for nominal level data.
The *bar chart* is appropriate for the graphical display of qualitative data only (nominal and ordinal). A bar chart represents the frequencies, proportions, or percentages of each value by a vertical or horizontal bar. The width of the bar is equal to 1.0, and the height (or length for a horizontal bar chart) is equal to the value's frequency, proportion, or percentage (it does not matter which because the shape will be the same regardless). When we make the width of the bar equal to 1 and the height (or length) equal to the value's frequency (or proportion or percentage), the total area of a bar in a bar chart corresponds to the area represented by the frequency (or proportion or percentage) of that value.
A *histogram* is very much like a bar chart. It is a graph of bars where the width of each bar on the *x* axis is equal to one (1.0) and the height of the bar on the *y* axis is equal to the value's frequency, percentage, or proportion. The histogram's bars are connected to one another, indicating that the underlying measurement continuum is continuous and quantitative. The bars on a histogram are placed on the graph from lowest score to highest score. In the bar chart, the placement of the values along the *x* axis was arbitrary. These can be used with interval and ratio level variables. A *polygon* or *line graph* can be used with continuous data. With a polygon, the frequency (or percentage or proportion) is represented by point or dot above each score, rather than by a rectangular bar, where the height of the point corresponds to the magnitude of the frequency.

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Answer Location: The Tabular and Graphical Displays of Qualitative Data and the Tabular and Graphical Displays of Quantitative Data
Cognitive Domain: Application

2. Discuss a normal distribution, a positively skewed distribution, and a negatively skewed distribution.
Ans: Answers may vary.
A *normal distribution* is a distribution that is symmetrical, which means that if you drew a line down the center of the distribution, the left half would look exactly like the right half. A normal distribution has a single peak in the middle of the distribution, with fewer and fewer cases as you move away from this middle. The ends of a distribution of continuous scores are often called the "tails" of the distribution. A distribution has both a left or negative tail and a right or positive tail.
A *positive skew* has the long tail of the distribution to the right, and the right side of the number line moves toward positive numbers. In a distribution with a positive skew, therefore, most of the scores cluster at lower values of the variable and there is a long right tail, indicating that there are a lot of high values with few cases at each value.
A *negative skew* has the long tail of the distribution to the left, and the left side. Most of the scores cluster at the higher end of the variable.
Answer Location: The Shape of a Distribution
Cognitive Domain: Comprehension

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