Chapter 2: Organizing Data Using Tables and Graphs

Multiple Choice Test Items

1. The advantage of creating frequency distributions is that they
    a. help to identify cause-and-effect relationships.
    b. help to make patterns and general trends in the data more noticeable.
    c. make it easier to see the raw scores.
    d. help to determine the appropriate scale of measurement to use.

2. In a frequency distribution, N will equal
    a. the sum of the X-scores.
    b. the number of times a particular score occurs.
    c. the sum of the *f* column.
    d. the number of times a tally mark is placed next to a score.

3. In a frequency distribution, *f* stands for
    a. the number of times a particular score occurs.
    b. the sum of the tally column.
    c. the total number of scores.
    d. the sum of the X-scores.

4. In constructing a simple frequency distribution,
    a. scores are arranged in order from low to high beginning at the top, skipping score values that were not achieved by anyone.
    b. scores are arranged in order from high to low, beginning at the top, skipping score values that were not achieved by anyone.
    c. scores are arranged in order from high to low, beginning at the top, including scores that were not achieved by anyone.
    d. scores are arranged in order from low to high beginning at the top, including scores that were not achieved by anyone.

5. Relative frequency is found by
    a. adding up the frequency column.
    b. dividing a score's frequency by N.
    c. dividing N by the score's frequency.
    d. adding up the X-column.

6. Relative frequency refers to
    a. the percentage of scores that fall at or below a given value.
    b. how many times a particular score occurs.
    c. the proportion of times that a particular score occurs.
    d. the frequency of scores that fall at or below a particular score value.

7. In a distribution of scores where N = 12, a score of 4 occurred three times. What is the relative frequency of that score?

a. .75
b. .25
c. .33
d. Not enough information is provided.

8. In a distribution of scores where N = 26, $f = 4$, and $cf = 14$ for a score of 7, what is the percentile rank for that score?
   a. 53.85
   b. .5385
   c. .1538
   d. 15.38

9. A cumulative frequency distribution table indicates
   a. the percentage of scores that fall at or below a particular score value.
   b. the proportion of times that a particular score occurs.
   c. the frequency with which a particular score occurs.
   d. the frequency of scores that fall at or below a particular value.

10. A cumulative frequency distribution begins with
    a. a simple frequency distribution table.
    b. a relative frequency distribution table.
    c. percentile ranks.
    d. a grouped frequency distribution table.

11. In a cumulative frequency distribution table, the *cf* at the top
    a. gives the total sum of all of the scores.
    b. gives the relative frequency for that particular score.
    c. is equal to N.
    d. is equal to the percentile rank.

12. In a grouped frequency distribution *i* refers to
    a. the range of the class interval.
    b. the number of class intervals.
    c. the number of scores in the class interval.
    d. the first entry in the class interval.

13. One of the class intervals in a grouped frequency distribution is 60 - 64. What is the size of the interval?
    a. 5
    b. 4
    c. 63
    d. 64

14. Which of the following is NOT one of the ground rules discussed in your text for constructing grouped frequency distributions?
    a. Interval sizes should be 2, 3, or 5.

b. Between 10 and 20 class intervals should be used.
c. The smallest scores go at the top of the distribution.
d. Your first class intervals should begin with a multiple of *i*.

15. The interval size of a grouped frequency distribution is 3 and the lowest score in the data set is 46. The first class interval entry should be _____.
    a. 46 - 49
    b. 45 - 47
    c. 46 - 48
    d. 45 - 46

16. For which type of distribution table do we need to calculate the range for the scores?
    a. a relative frequency distribution
    b. a simple frequency distribution
    c. a cumulative frequency distribution
    d. a grouped frequency distribution

17. The ground rules in your text specify that the size of class intervals should be
    a. 2, 3, or 5.
    b. 2, 3, or 4.
    c. 3, 5, or 10.
    d. 10 or 20.

18. The ground rules in your text specify that the number of class intervals should be
    a. between 5 and 10.
    b. between 10 and 20.
    c. 2, 3, or 5.
    d. 5, 10, or 20.

19. If the range in a distribution of scores is 63, we should use an *i* of
    a. 2.
    b. 3.
    c. 5.
    d. 10.

20. The highest score in a distribution is 74 and the lowest score is 51. What is the range?
    a. 24.5
    b. 23.5
    c. 23
    d. 24

21. When the data from a frequency distribution are graphed, the frequencies are shown
    a. along the y-axis.
    b. along the x-axis.
    c. along the abscissa.
    d. across the top of the graph.

22. Abscissa is to ordinate as
    a. y-axis is to x-axis.
    b. x-axis is to y-axis.
    c. vertical line is to horizontal line.
    d. positive skew is to negative skew.

23. In the graph of a frequency distribution, the ordinate represents
    a. the frequencies of scores.
    b. the values of the variable being measured.
    c. the scores on the vertical axis.
    d. the width of the class intervals.

24. Which of the following does not belong?
    a. bar graph
    b. histogram
    c. percentile rank
    d. frequency polygon

25. Which of the following is NOT true of bar graphs?
    a. They are used for qualitative variables that differ in kind.
    b. They are used for quantitative variables that differ in amount.
    c. The bars are spatially separated.
    d. They can be used for data measured on nominal or ordinal scales.

26. Which of the following is true of bar graphs?
    a. They are used for quantitative variables that differ in kind.
    b. They can be used for data measured on interval or ratio scales.
    c. The bars touch each other to reflect the continuous nature of the variable being measured.
    d. The bars are spatially separated.

27. Which of the following is NOT true of histograms.
    a. They are used for quantitative variables that differ in kind.
    b. They can be used for data measured on interval or ratio scales.
    c. The bars touch each other to reflect the continuous nature of the variable being measured.
    d. The bars are spatially separated.

28. Which type of graph uses dots rather than bars?
    a. bar graphs
    b. histograms
    c. percentile ranks
    d. frequency polygons

29. Which type of graph is best for making comparisons between two sets of data?
    a. frequency polygons
    b. histograms
    c. percentile ranks
    d. bar graphs

30. Which type of graphs are appropriate for data measured on interval and ratio scales?
    a. bar graphs and histograms
    b. frequency polygons and bar graphs
    c. histograms and frequency polygons
    d. bar graphs, histograms, and frequency polygons

31. Which type of graph should be used to show the frequency data for the scores of male and female athletes?
    a. histogram
    b. frequency polygon
    c. percentile rank
    d. bar graph

32. For which scale of measurement(s) can bar graphs be used?
    a. interval only
    b. nominal only
    c. interval or ratio
    d. nominal or ordinal

33. For which scale of measurement(s) can histograms be used?
    a. interval only
    b. nominal only
    c. interval or ratio
    d. nominal or ordinal

34. A histogram or frequency polygon should be used for graphing which of the following data?
    a. military rank
    b. distance traveled
    c. types of trees
    d. letter grades

35. A bar graph should be used for illustrating which of the following data?
    a. types of cars
    b. blood pressures
    c. heights of children
    d. running speed

36. Empirical distributions are
    a. theoretical.

b. based on the mathematical probability of the frequencies of scores in a population.
c. based on actual frequencies of scores.
d. drawn with smooth lines without dots.

37. Which of the following is NOT true of theoretical distributions?
    a. They are based on frequencies of actual scores.
    b. They are based on the mathematical probability of scores in a population.
    c. They are drawn with smooth lines without dots.
    d. An example is the normal distribution curve.

38. Which of the following is NOT true of the normal distribution curve?
    a. It has tails that are asymptotic.
    b. It is based on an infinite number of cases.
    c. It begins with a frequency of 0.
    d. The tails never touch the baseline.

39. In a normal distribution curve
    a. the most frequently occurring scores are toward the right side.
    b. the most frequently occurring scores are in the middle.
    c. the most frequently occurring scores are towards the left side.
    d. the scores are distributed equally across the entire distribution.

40. Skewed distributions
    a. are symmetrical.
    b. are a type of normal distribution.
    c. have scores that stack up at either the high or low end of the distribution.
    d. both b and c are true.

41. In a positively skewed distribution
    a. all of the scores are negative.
    b. all of the scores are positive.
    c. there are more high scores than low scores.
    d. there are more low scores than high scores.

42. In a negatively skewed distribution
    a. there are fewer high scores than low scores.
    b. there are fewer low scores than high scores.
    c. all of the scores are positive.
    d. all of the scores are negative.

43. The most frequently occurring scores are in the middle in a _____ distribution.
    a. normal
    b. positively skewed
    c. negatively skewed
    d. rectangular

44. In a positively skewed distribution of scores that ranges from 0 to 100, the most frequently occurring scores will be nearest to
    a. 20.
    b. 40.
    c. 60.
    d. 80.

45. In a negatively skewed distribution that ranges from 0 to 50, the least frequently occurring scores will be nearest to
    a. 10.
    b. 30.
    c. 40.
    d. 50.

46. In a distribution of US salaries, most are at the lower end and there are fewer who make high salaries. This describes a _____ distribution.
    a. normal
    b. negatively skewed
    c. positively skewed
    d. bimodal

47. If a test is very easy, the shape of the distribution will be
    a. normal.
    b. negatively skewed.
    c. positively skewed.
    d. bimodal.

48. For the scores: 4, 4, 4, 6, 6, 6, 6, 8, 8, 8, what is the shape of the distribution?
    a. symmetrical
    b. positively skewed
    c. negatively skewed
    d. bimodal

49. For the scores: 85, 79, 25, 15, 85, 85, 80, 75, what is the shape of the distribution?
    a. symmetrical
    b. positively skewed
    c. negatively skewed
    d. bimodal

50. For the scores: 5, 5, 7, 7, 7, 7, 10, 10, 10, 10, 12, 12, 12, 20, 20, 35, 40, what is the shape of the distribution?
    a. symmetrical
    b. positively skewed
    c. negatively skewed
    d. bimodal

Other Test Items

1. What is the benefit of creating a grouped frequency distribution table rather than an ungrouped simple frequency distribution table?

2. How are bar graphs different from histograms?

3. What is the main advantage of using frequency polygons over histograms?

4. Identify the appropriate type of graph(s) that should be used for the variables listed below.
    a. Brands of coffee _____
    b. Degree longitude _____
    c. Reaction time _____
    d. Favorite flowers _____
    e. Temperature Fahrenheit _____
    f. Distance traveled _____
    g. A comparison of pre-test and post-test scores _____
    h. Ice cream preferences _____

5. Compare and contrast positively skewed distributions and negatively skewed distributions and give an example of each.

6. Identify whether scores on the following variables would result in graphs that are positively skewed (PS) or negatively skewed (NS).
    a. Age at retirement _____
    b. Weights of marathon runners _____
    c. Income of professional athletes _____
    d. Self-esteem of celebrities _____
    e. Scores of 5th graders on a college entrance exam _____
    f. Racing speed of tortoises _____

7. A set of scores has the following distribution:

X	*f*
12	1
11	3
10	2
9	2
8	1

    a. What is *N*?
    b. What is the cumulative frequency of a score of 10?
    c. What is the percentile rank of a score of 11?
    d. What is the relative frequency of a score of 9?

8. Suppose you are constructing a grouped frequency distribution for a data set that has a high score of 59 and a low score of 35.
    a. What is the range?
    b. What should the size of the class interval be?
    c. What should the first entry be at the bottom of the distribution?

9. Construct a grouped frequency distribution for the following set of scores?

73	52	96	82
61	98	68	53
89	41	43	86
72	34	72	55

Answers to Multiple Choice Test Items

1. b	14. c	27. d	40. c
2. c	15. b	28. d	41. d
3. a	16. d	29. a	42. b
4. c	17. a	30. c	43. a
5. b	18. b	31. b	44. a
6. c	19. c	32. d	45. a
7. b	20. d	33. c	46. c
8. a	21. a	34. b	47. b
9. d	22. b	35. a	48. a
10. a	23. a	36. c	49. c
11. c	24. c	37. a	50. b
12. c	25. b	38. c	
13. a	26. d	39. b	

Answers to Other Test Items

1. In an ungrouped simple frequency distribution table, each score is listed separately. If there are a large number of scores spread out over a broad span, the scores become unremarkable and it becomes difficult to discern any patterns. On the other hand, if the scores are grouped together into class intervals, overall trends in the data become more apparent.

2. Bar graphs are used for qualitative variables that differ in kind. This would include data measured on nominal and ordinal scales. On bar graphs, the heights of the bars reflect the frequencies of the data. The bars are spatially separated to illustrate their discontinuous nature. Histograms look similar to bar graphs except that they serve a different purpose and the bars touch each other. Histograms are used for quantitative variables that differ in amount, including data measured on interval and ratio scales. The bars touch each other to reflect the continuous nature of the measured variable (e.g., different amounts of the same variable).

3. Frequency polygons are preferable to histograms when it is desirable to compare data from different distributions because more than one set of scores can be shown on the same graph. Different colors of lines can be used in a frequency polygon to represent the different sets of data. The same is *not* true of a histogram because the bars from one set of scores cannot be superimposed over the bars of another without them being concealed.

4. Type of graph
    a. Bar graph
    b. Histogram or frequency polygon
    c. Histogram or frequency polygon
    d. Bar graph
    e. Histogram or frequency polygon
    f. Histogram or frequency polygon
    g. Frequency polygon
    h. Bar graph

5. Both positively skewed and negatively skewed distributions are asymmetrical. Instead, they have scores that tend to stack up at one end of the distribution or the other and have fewer scores at the other end. The scores of positively skewed distributions tend to pile up at the low end with fewer high scores. An example would be a difficult test; there would be more low scores and fewer high scores. On the other hand, scores on a negatively skewed distribution tend to pile up at the high end with fewer low scores. An example would be age at retirement; most people are older when they retire with fewer who retire at a young age.

6. Positively skewed (PS) or negatively skewed (NS) distributions:
    a. NS
    b. PS
    c. NS
    d. NS
    e. PS
    f. PS

7. For the following set of scores:

X	*f*	*cf*
12	1	9
11	3	8
10	2	5
9	2	3
8	1	1

    a. $N = 9$
    b. *cf* of score of 10 = 5
    c. *P.R.* of a score of 11 = 88.89
    d. Rel *f* of a score of 9 = .22

8. When constructing a grouped frequency distribution:
    a. Range: 59.5 - 34.5 = 25
    b. Size of class interval: 25 ÷ 2 = 12.5; thus, $i = 2$
    c. First entry at bottom: 34 - 35

9. Grouped frequency distribution

Class Intervals	Tally	f
95 - 99	||	2
90 - 94		0
85 - 89	||	2
80 - 84	|	1
75 - 79		0
70 - 74	|||	3
65 - 69	|	1
60 - 64	|	1
55 - 59	|	1
50 - 54	||	2
45 - 49		0
40 - 44	||	2
35 - 39		0
30 - 34	|	1
		$N = 16$