Chapter 2
Describing Data: Frequency Distributions and Graphic Presentations

True/False

1. A frequency distribution groups data into classes showing the number of observations in each class.

2. A frequency distribution for qualitative data shows the number of observations in each class.

3. A frequency distribution for qualitative data has class limits.

4. The midpoint of a class, which is also called a class mark, is halfway between the lower and upper limits.

5. A class interval, which is the width of a class, can be determined by subtracting the lower limit of a class from the lower limit of the next higher class.

6. In constructing a frequency distribution, you should try to have open-ended classes such as "Under $100" and "$1,000 and over".

7. When constructing a frequency distribution, try to include overlapping stated class limits, such as 100 up to 201, 200 up to 301, and 300 up to 401.

8. To convert a frequency distribution to a relative frequency distribution, divide each class frequency by the sum of the class frequencies.

9. To construct a histogram, the class frequencies are plotted on the vertical or *Y*-axis and either the stated limits, the true limits or the midpoints are plotted on the horizontal or *X*-axis.
Answer: 9. True   Difficulty: Easy   Goal: 4

10. A pie chart shows the number of observations in each class.

11. A pie chart is similar to a relative frequency distribution.

12. To construct a pie chart, relative class frequencies are used to graph the "slices" of the pie.

13. A cumulative frequency distribution is used when we want to determine how many observations lie above or below certain values.

14. In general, we should construct a frequency distribution so that there are either 4 or 24 classes.

15. The height of a bar in a histogram represents the number of observations for a class.

16. A relative frequency distribution shows the number of observations in each class.

Multiple Choice

17. Monthly commissions of first-year insurance brokers are $1,270, $1,310, $1,680, $1,380, $1,410, $1,570, $1,180 and $1,420. These figures are referred to as:
A) histogram.
B) raw data.
C) frequency distribution.
D) frequency polygon.
E) none of the above.

18. A small sample of computer operators shows monthly incomes of $1,950, $1,775, $2,060, $1,840, $1,795, $1,890, $1,925 and $1,810. What are these ungrouped numbers called?
A) Histogram
B) Class limits

C) Class frequencies
D) Raw data
E) None of the above

19. For qualitative data, the relative frequency for a class is computed as
A) Class width divided by class interval.
B) Class midpoint divided by the class frequency.
C) Class frequency divided by the class interval.
D) Class frequency divided by the total frequency.

20. For quantitative data, the relative frequency for a class is computed as
A) Class width divided by class interval.
B) Class midpoint divided by the class frequency.
C) Class frequency divided by the class interval.
D) Class frequency divided by the total frequency.

21. A group of 100 students were surveyed about their interest in a new Economics major. Interest was measured in terms of high, medium, or low. 30 students responded high interest; 50 students responded medium interest; 20 students responded low interest. What is the best way to illustrate the results of the study?
A) Cumulative frequency polygon
B) Bar chart
C) Pie chart
D) Frequency table

22. The monthly salaries of a sample of 100 employees were rounded to the nearest ten dollars. They ranged from a low of $1,040 to a high of $1,720. If we want to condense the data into seven classes, what is the most convenient class interval?
A) $ 50
B) $100
C) $150
D) $200
E) None of the above

23. For the following distribution of heights, what are the limits for the class with the greatest frequency?

Heights	60" up to 65"	65" up to 70"	70" up to 75"
Number	10	70	20

A) 64 and up to 70
B) 65 and 69
C) 65 and up to 70
D) 69.5 and 74.5
E) None of the above

24. In a frequency distribution, what is the number of observations in a class called?
A) Class midpoint
B) Class interval
C) Class array
D) Class frequency
E) None of the above

25. The age distribution of a sample of the part-time employees at Lloyd's Fast Food Emporium is:

Ages	Cumulative Number
18 up to 23	6
23 up to 28	19
28 up to 33	52
33 up to 38	61
38 up to 43	65

What type of chart has the data been organized to draw?
A) Histogram
B) Simple line chart
C) Cumulative Frequency Distribution
D) Pie chart
E) Frequency polygon

26. A sample distribution of hourly earnings in Paul's Cookie Factory is:

Hourly Earnings	$6 up to $9	$9 up to $12	$12 up to $15
Numbers	16	42	10

The limits of the class with the smallest frequency are:
A) $ 6.00 and $9.00
B) $12.00 and up to $14.00
C) $11.75 and $14.25
D) $12.00 and up to $15.00
E) None of the above

Use the following to answer questions 27-31:
Refer to the following distribution of commissions:

Monthly commissions	Class Frequencies
$ 600 up to $800	3
800 up to 1,000	7
1,000 up to 1,200	11
1,200 up to 1,400	22
1,400 up to 1,600	40
1,600 up to 1,800	24
1,800 up to 2,000	9
2,000 up to 2,200	4

27. What is the relative frequency for those salespersons that earn between $1,600 and $1,799?
A) 2%
B) 2.4%
C) 20%
D) 24%
E) None of the above

28. The first plot for a cumulative frequency distribution would be:
A) $X = 0$, $Y = 600$.
B) $X = 600$, $Y = 3$.
C) $X = 3$, $Y = 600$.
D) $X = 600$, $Y = 0$.
E) none of the above.

29. What is the relative frequency of those salespersons that earn more than $1,599?

A) 25.5%
B) 27.5%
C) 29.5%
D) 30.8%
E) None of the above

30. For the distribution above, what is the midpoint of the class with the greatest frequency?
A) 1400
B) 1500
C) 1700
D) The midpoint cannot be determined
E) None of the above

31. What is the class interval?
A) 200
B) 300
C) 3.500
D) 400
E) None of the above

Use the following to answer questions 32-34:
Refer to the following wage breakdown for a garment factory.

Hourly Wages	Number of Wage Earners
$ 4 up to $7	18
7 up to 10	36
10 up to 13	20
13 up to 16	6

32. What is the class interval for the table of wages above?
A) $2
B) $3
C) $4
D) $5
E) None of the above

33. What is the class midpoint for the class with the greatest frequency?
A) $ 5.50
B) $ 8.50
C) $11.50
D) $14.50
E) None of the above

34. What are the class limits for the class with the smallest number of frequencies?
A) 3.5 and 6.5
B) 4 and up to 7
C) 13 and up to 16
D) 12.5 and 15.5
E) None of the above

Use the following to answer questions 35-37:
Refer to the following distribution of ages:

Ages	Number
40 up to 50	10
50 up to 60	28
60 up to 70	12

35. For the distribution of ages above, what is the relative class frequency for the lowest class?
A) 50%
B) 18%
C) 20%
D) 10%
E) None of the above

36. What is the class interval?
A) 9
B) 10
C) 10.5
D) 11
E) None of the above

37. What is the class midpoint of the highest class?
A) 54
B) 55
C) 64
D) 65
E) None of the above

Use the following to answer questions 38-40:
Refer to the following information from a frequency distribution for heights of college women recorded to the nearest inch:
The first two class midpoints are 62.5" and 65.5".

38. What is the class interval?
A) 1"
B) 2"
C) 2.5"
D) 3"
E) None of the above

39. What are the class limits for the lowest class?
A) 61 and up to 64
B) 62 and up to 64
C) 62 and 65
D) 62 and 63
E) None of the above

40. What are the class limits for the third class?
A) 64 and up to 67
B) 67 and 69
C) 67 and up to 70
D) 66 and 68
E) None of the above
Answer: 40. C   Difficulty: Hard   Goal: 3

Use the following to answer questions 41-43:
Refer to the following distribution:

Cost of Textbooks	Number
$25 up to $35	2
35 up to 45	5
45 up to 55	7
55 up to 65	20
65 up to 75	16

41. What is the relative class frequency for the $25 up to $35 class?
A) 2%
B) 4%
C) 5%
D) 10%
E) None of the above.

42. What is the class midpoint for the $45 up to $55 class?
A) 49
B) 49.5
C) 50
D) 50.5
E) None of the above

43. What are the class limits for class with the highest frequency?
A) 55 and 64
B) 54 and 64
C) 55 and up to 65
D) 55 and 64.5
E) None of the above

Use the following to answer questions 44-47:
Refer to the following frequency distribution on days absent during a calendar year by employees of a manufacturing company:

Days Absent	Cumulative Number of Employees
0 up to 3	60
3 up to 6	31
6 up to 9	14
9 up to 12	6
12 up to 15	2

44. How many employees were absent between 3 up to 6 days?
A) 31
B) 29
C) 14
D) 2
E) 17

45. How many employees were absent fewer than six days?
A) 60
B) 31
C) 91
D) 46
E) None of the above

46. How many employees were absent more than five days?
A) 8
B) 4
C) 22
D) 31
E) None of the above

47. How many employees were absent from 6 up to 12 days?
A) 20
B) 8
C) 12
D) 17
E) None of the above

Use the following to answer questions 48-50:
Refer to the following breakdown of responses to a survey of room cleanliness in a hotel.

Response	Frequency
Not satisfied	20
Satisfied	40
Highly satisfied	20

48. What is the class interval for the frequency table above?
A) 10
B) 20
C) 40
D) None of the above

49. What is the class with the greatest frequency?
A) Not satisfied
B) Satisfied
C) Highly satisfied
D) None of the above

50. What percent of the responses indicated that customers were satisfied?
A) 20
B) 25%
C) 50%
D) 100%

Answers

1. True   2. True   3. False   4. True   5. True   6. False   7. False   8. True
10. False   11. True   12. True   13. True   14. False   15. True   16. False
17. B   18. D   19. D   20. D   21. C   22. B   23. C   24. D   25. C   26. D
27. C   28. D   29. D   30. B   31. A   32. B   33. B   34. C   35. C   36. B
37. D   38. D   39. A   41. B   42. C   43. C   44. A   45. C   46. E   47. A
48. D   49. B   50. C