Test Bank for Basic Statistics in Business and Economics 10th Edition by Lind

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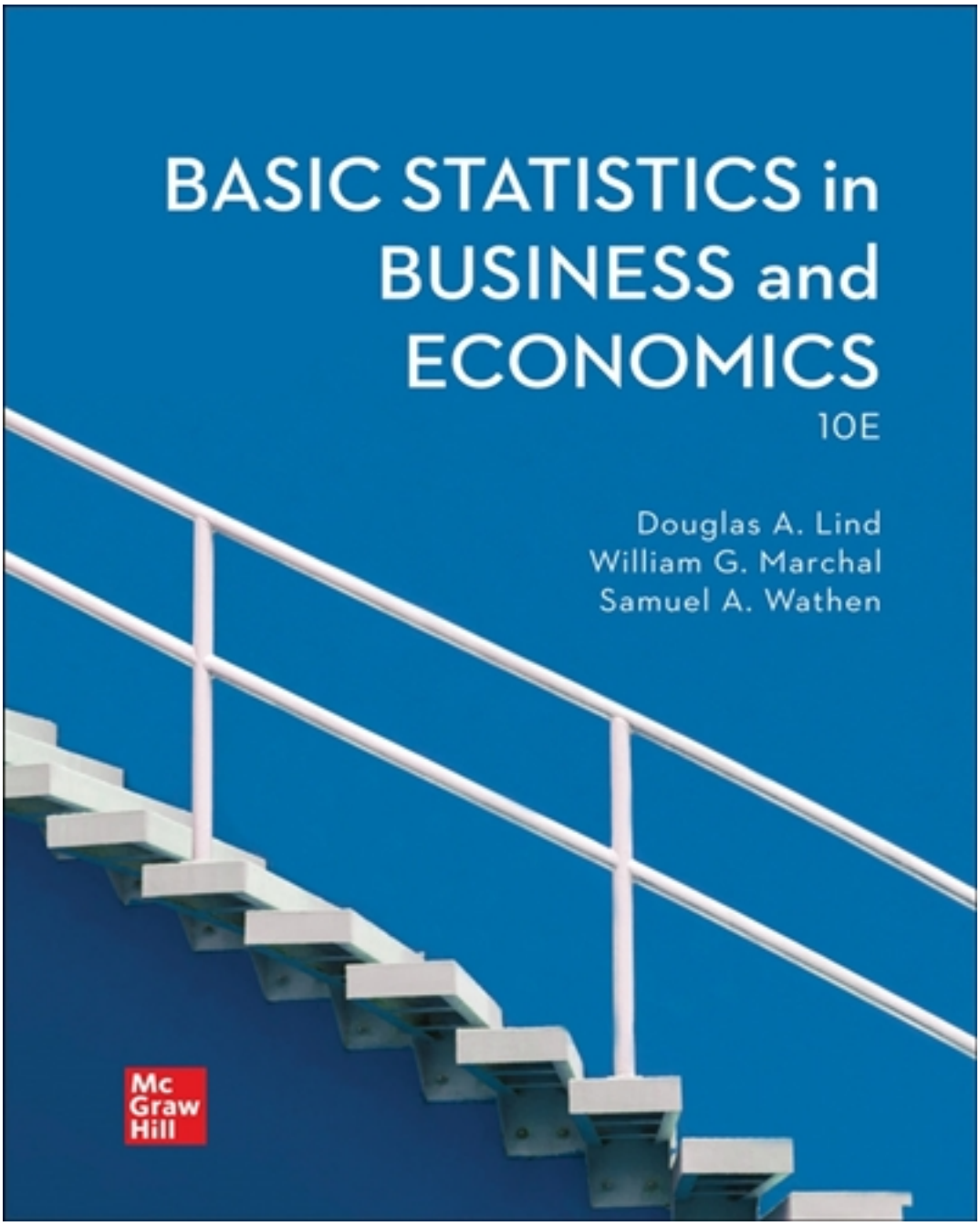

Test Bank

Basic Statistics in Business and Economics Edition 10 by Lind

CORRECT ANSWERS ARE LOCATED IN THE 2ND HALF OF THIS DOC.

TRUE/FALSE - Write 'T' if the statement is true and 'F' if the statement is false.

1) After using the "2 to the kth" rule, it suggests that your graph have 9 classes. However, you decide to use 10 classes instead of 9. Your decision to use 10 classes causes the class interval to be larger.
   - ◎ true
   - ◎ false

2) A frequency distribution is a grouping of quantitative data into overlapping classes showing the number of observations in each class.
   - ◎ true
   - ◎ false

3) A frequency table for qualitative data has class limits.
   - ◎ true
   - ◎ false

4) To summarize the gender of students attending a college, the number of classes in a frequency table depends on the number of students.
   - ◎ true
   - ◎ false

5) In frequency distributions, classes are mutually exclusive if each individual, object, or measurement is included in only one category.
   - ◎ true
   - ◎ false

6) In a bar chart, the horizontal axis is usually labeled with the values of a qualitative variable.
   - ◎ true
   - ◎ false

7) In a bar chart, the heights of the bars represent the frequencies in each class.
   - ◎ true
   - ◎ false

8) The midpoint of a class is halfway between the lower and upper limits.
   - ◎ true
   - ◎ false

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9) A class interval can be determined by subtracting the lower limit of a class from the lower limit of the next higher class.
- ◎ true
- ◎ false

10) To convert a frequency distribution to a relative frequency distribution, divide each class frequency by the sum of the class frequencies.
- ◎ true
- ◎ false

11) To convert a frequency distribution to a relative frequency distribution, divide each class frequency by the number of classes.
- ◎ true
- ◎ false

12) A pie chart is similar to a relative frequency distribution.
- ◎ true
- ◎ false

13) A pie chart shows the relative frequency in each class.
- ◎ true
- ◎ false

14) To construct a pie chart, relative class frequencies are used to graph the "slices" of the pie.
- ◎ true
- ◎ false

15) A cumulative frequency distribution is used when we want to determine how many observations lie above or below certain values.
- ◎ true
- ◎ false

16) A frequency polygon is a very useful graphic technique when comparing two or more distributions.
- ◎ true
- ◎ false

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MULTIPLE CHOICE - Choose the one alternative that best completes the statement or answers the question.

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) a histogram.
B) raw data.
C) a frequency distribution.
D) a frequency polygon.

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) Histograms
B) Class limits
C) Class frequencies
D) Raw data

19) When data are collected using a quantitative, ratio variable, what is true about a frequency distribution that summarizes the data?
A) Upper and lower class limits must be calculated.
B) A pie chart can be used to summarize the data.
C) The number of classes is equal to the number of variable values.
D) The "5 to the k rule" can be applied.

20) When data are collected using a qualitative, nominal variable, what is true about a frequency table that summarizes the data?
A) The upper and lower class limits must be calculated.
B) A pie chart can be used to summarize the data.
C) The number of classes is equal to the number of variable's values plus 2.
D) The "5 to the k rule" can be applied.

21) When data are collected using a qualitative, nominal variable (e.g., male or female), what is true about a frequency table that summarizes the data?
A) The upper and lower class limits must be calculated.
B) Class midpoints can be computed.
C) The number of classes corresponds to the number of a variable's values.
D) The "2 to the k rule" can be applied.

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22) A student was interested in the cigarette-smoking habits of college students and collected data from an unbiased random sample of students. The data are summarized in the following table.

Males	50
Females	75
Males who smoke	20
Males who do not smoke	30
Females who smoke	25
Females who do not smoke	50

What is wrong with this frequency table?

A) The number of males does not equal the sum of males that smoke and do not smoke.
B) The classes are not mutually exclusive.
C) There are too many classes.
D) Class limits cannot be computed.

23) A student was interested in the cigarette-smoking habits of college students and collected data from an unbiased random sample of students. The data are summarized in the following table.

Males who smoke	20
Males who do not smoke	30
Females who smoke	25
Females who do not smoke	50

What type of chart would best represent the data from this frequency table?

A) Bar chart
B) Box plot
C) Scatterplot
D) Frequency polygon

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24) A student was interested in the cigarette-smoking habits of college students and collected data from an unbiased random sample of students. The data are summarized in the following table.

Males who smoke	20
Males who do not smoke	30
Females who smoke	25
Females who do not smoke	50

What type of chart best represents the relative class frequencies?

A) Box plot
B) Pie chart
C) Scatterplot
D) Frequency polygon

25) When a class interval is expressed as 100 up to 200,

A) observations with values of 100 are excluded from the class.
B) observations with values of 200 are included in the class.
C) observations with values of 200 are excluded from the class.
D) the class interval is 99.

26) For a relative frequency distribution, relative frequency is computed as

A) the class width divided by the class interval.
B) the class midpoint divided by the class frequency.
C) the class frequency divided by the class interval.
D) the class frequency divided by the number of observations.

27) The relative frequency for a class represents the

A) class width.
B) class midpoint.
C) class interval.
D) percentage of observations in the class.

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28) A group of 100 students was surveyed about their interest in a new International Studies program. Interest was measured in terms of high, medium, or low. In the study, 30 students responded high interest, 40 students responded medium interest, and 30 students responded low interest. What is the relative frequency of students with high interest?
A) 0.30
B) 0.50
C) 0.40
D) 0.030

29) 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. In the study, 30 students responded high interest, 50 students responded medium interest, and 20 students responded low interest. What is the best way to illustrate the relative frequency of student interest?
A) Use a cumulative frequency polygon.
B) Use a box plot.
C) Use a pie chart.
D) Use a frequency table.

30) The monthly salaries of a sample of 100 employees were rounded to the nearest $10. 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

31) A student was studying the political party preferences of a university's student population. The survey instrument asked students to identify themselves as a Democrat or a Republican. This question is flawed because
A) students generally don't know their political preferences.
B) political preference is a continuous variable.
C) the categories are generally mutually exclusive.
D) the categories are not exhaustive.
E) political preference is a continuous variable.

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32) A student was studying the political party preferences of a university's student population. The survey instrument asked students to identify their political preferences—for example, Democrat, Republican, Libertarian, or another party. The best way to illustrate the frequencies for each political preference is a

A) bar chart.
B) box plot.
C) histogram.
D) frequency polygon.

33) A student was studying the political party preferences of a university's student population. The survey instrument asked students to identify their political preferences—for example, Democrat, Republican, Libertarian, or another party. The best way to illustrate the relative frequency distribution is a

A) bar chart.
B) pie chart.
C) histogram.
D) frequency polygon.

34) What is the following table called?

Ages	Number of Ages
20 up to 30	16
30 up to 40	25
40 up to 50	51
50 up to 60	80
60 up to 70	20
70 up to 80	8

A) Histogram
B) Frequency polygon
C) Cumulative frequency distribution
D) Frequency distribution

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35) 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"
Frequency	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

36) In a frequency distribution, the number of observations in a class is called the class
A) midpoint.
B) interval.
C) array.
D) frequency.

37) Why are unequal class intervals sometimes used in a frequency distribution?
A) To avoid a large number of classes with very small frequencies
B) For the sake of variety in presenting the data
C) To make the class frequencies smaller
D) To avoid the need for midpoints

38) The number of employees less than the upper limit of each class at Lloyd's Fast Food Emporium is shown in the following table.

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 is it called?
A) A histogram
B) A cumulative frequency distribution
C) A pie chart
D) A frequency polygon

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39) Here is a sample distribution of hourly earnings in Paul's Cookie Factory.

Hourly Earning	$6 up to $9	$9 up to $12	$12 up to $15
Frequency	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.

40) 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	12
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

What is the relative frequency for salespeople who earn from $1,600 up to $1,800?

A) 0.02
B) 0.024
C) 0.20
D) 0.24

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41) 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	12
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

To plot a cumulative frequency distribution, the first coordinate would be

A) $X = 0$, $Y = 600$.
B) $X = 500$, $Y = 3$.
C) $X = 3$, $Y = 600$.
D) $X = 600$, $Y = 0$.

42) 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

What is the relative frequency of salespeople who earn $1,600 or more?

A) 29.5%
B) 25.5%
C) 30.8%
D) 27.5%
E) 29.5%
F) 30.8%

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43) 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	12
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

For the preceding distribution, what is the midpoint of the class with the greatest frequency?

A) 1,400
B) 1,500
C) 1,700
D) The midpoint cannot be determined.

44) 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	12
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

What is the class interval?

A) 200
B) 300
C) 3,500
D) 400

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45) Refer to the following wage breakdown for a garment factory.

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

What is the class interval for the preceding table of wages?

A) $2
B) $3
C) $4
D) $5

46) Refer to the following wage breakdown for a garment factory.

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

What is the class midpoint for the class with the greatest frequency?

A) $5.50
B) $8.50
C) $11.50
D) $14.50

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47) Refer to the following wage breakdown for a garment factory.

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

What are the class limits for the class with the smallest frequency?

A) 3.5 and 6.5
B) 4 and up to 7
C) 13 and up to 16
D) 12.5 and 15.5

48) Refer to the following distribution of ages.

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

For this distribution of ages, what is the relative class frequency for the lowest class?

A) 0.50
B) 0.18
C) 0.20
D) 0.10

49) Refer to the following distribution of ages.

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

What is the class interval?

A) 9
B) 10
C) 10.5
D) 11

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50) Refer to the following distribution of ages.

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

What is the class midpoint of the highest class?

A) 65
B) 55
C) 54
D) 64

51) 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". What is the class interval?

A) 1"
B) 2"
C) 2.5"
D) 3"

52) 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 80.5" and 83.5". What are the class limits for the lowest class?

A) 79" and up to 82"
B) 80" and up to 82"
C) 80" and 83"
D) 80" and 81"

53) 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". 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"

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54) 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 74.5" and 77.5". What are the class limits for the third class?

A) 76" and up to 79"
B) 79" and 81"
C) 79" and up to 82"
D) 78" and 80"

55) 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". 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"

56) Refer to the following distribution:

Cost of Textbooks	Frequency
$25 up to $35	3
35 up to 45	20
45 up to 55	12
55 up to 65	14
65 up to 75	11

What is the relative class frequency for the $25 up to $35 class?

A) 0.03
B) 0.05
C) 0.06
D) 0.11

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57) Refer to the following distribution:

Cost of Textbooks	Frequency
$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

What is the relative class frequency for the $25 up to $35 class?

A) 0.02
B) 0.04
C) 0.05
D) 0.10

58) Refer to the following distribution:

Cost of Textbooks	Frequency
$38 up to $48	2
48 up to 58	5
58 up to 68	7
68 up to 78	20
78 up to 88	16

What is the class midpoint for the $58 up to $68 class?

A) $62.00
B) $62.50
C) $63.00
D) $63.50

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59) Refer to the following distribution:

Cost of Textbooks	Frequency
$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

What is the class midpoint for the $45 up to $55 class?

A) $49
B) $49.5
C) $50
D) $50.5

60) Refer to the following distribution:

Cost of Textbooks	Frequency
$25 up to $35	12
35 up to 45	14
45 up to 55	6
55 up to 65	8
65 up to 75	20

What are the class limits for the class with the highest frequency?

A) $65 up to $74
B) $64 up to $74
C) $65 up to $75
D) $65 up to $74.5

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61) Refer to the following distribution:

Cost of Textbooks	Frequency
$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

What are the class limits for the class with the highest frequency?

A) $55 up to $64
B) $54 up to $64
C) $55 up to $65
D) $55 up to $64.5

62) Refer to the following frequency distribution of days absent during a calendar year by employees of a manufacturing company:

Days Absent	Number of Employees
0 up to 3	13
3 up to 6	43
6 up to 9	36
9 up to 12	11
12 up to 15	14

How many employees were absent for 3 up to 6 days?

A) 43
B) 51
C) 36
D) 14

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63) Refer to the following frequency distribution of days absent during a calendar year by employees of a manufacturing company:

Days Absent	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

How many employees were absent for 3 up to 6 days?

A) 31
B) 29
C) 14
D) 2

64) Refer to the following frequency distribution of days absent during a calendar year by employees of a manufacturing company:

Days Absent	Number of Employees
0 up to 3	36
3 up to 6	34
6 up to 9	25
9 up to 12	18
12 up to 15	52

How many employees were absent fewer than six days?

A) 36
B) 34
C) 70
D) 49

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65) Refer to the following frequency distribution of days absent during a calendar year by employees of a manufacturing company:

Days Absent	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

How many employees were absent fewer than six days?

A) 60
B) 31
C) 91
D) 46

66) Refer to the following frequency distribution of days absent during a calendar year by employees of a manufacturing company:

Days Absent	Number of Employees
0 up to 3	36
3 up to 6	34
6 up to 9	25
9 up to 12	18
12 up to 15	52

How many employees were absent six or more days?

A) 70
B) 16
C) 95
D) 34

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67) Refer to the following frequency distribution of days absent during a calendar year by employees of a manufacturing company:

Days Absent	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

How many employees were absent six or more days?

A) 8
B) 4
C) 22
D) 31

68) Refer to the following frequency distribution of days absent during a calendar year by employees of a manufacturing company:

Days Absent	Number of Employees
0 up to 3	14
3 up to 6	49
6 up to 9	58
9 up to 12	28
12 up to 15	6

How many employees were absent for 6 up to 12 days?

A) 86
B) 34
C) 56
D) 61

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69) Refer to the following frequency distribution of days absent during a calendar year by employees of a manufacturing company:

Days Absent	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

How many employees were absent for 6 up to 12 days?

A) 20
B) 8
C) 12
D) 17

70) Refer to the following breakdown of responses to a survey of room service in a hotel.

Response	Frequency
Not satisfied	20
Satisfied	40
Highly satisfied	60

What is the class interval for this frequency table?

A) 10
B) 20
C) 40
D) None apply

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71) Refer to the following breakdown of responses to a survey of room service in a hotel.

Response	Frequency
Not satisfied	20
Satisfied	40
Highly satisfied	60

What is the class with the greatest frequency?

A) Not satisfied
B) Satisfied
C) Highly satisfied
D) None apply

72) Refer to the following breakdown of responses to a survey of room service in a hotel:

Response	Frequency
Not satisfied	50
Satisfied	40
Highly satisfied	30

What percentage of the responses indicated that customers were satisfied?

A) 40%
B) 33%
C) 25%
D) 100%

73) Refer to the following breakdown of responses to a survey of room service in a hotel:

Response	Frequency
Not satisfied	20
Satisfied	40
Highly satisfied	60

What percentage of the responses indicated that customers were satisfied?

A) 40%
B) 33%
C) 50%
D) 100%

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74) Refer to the following breakdown of responses to a survey of room service in a hotel.

Response	Frequency
Not satisfied	20
Satisfied	40
Highly satisfied	60

What type of chart should be used to describe the frequency table?

A) A pie chart
B) A bar chart
C) A histogram
D) A frequency polygon

75) Refer to the following breakdown of responses to a survey of room service in a hotel.

Response	Frequency
Not satisfied	20
Satisfied	40
Highly satisfied	60

What type of chart should be used to show relative class frequencies?

A) A pie chart
B) A bar chart
C) A histogram
D) A frequency polygon

76) Refer to the following breakdown of responses to a survey of "Are you concerned about being tracked while connected to the Internet?"

Response	Frequency
Very concerned	140
Somewhat concerned	40
No concern	20

What is the class interval for the preceding frequency table?

A) 10
B) 20
C) 40
D) None apply

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77) Refer to the following breakdown of responses to a survey of "Are you concerned about being tracked while connected to the Internet?"

Response	Frequency
Very concerned	140
Somewhat concerned	40
No concern	20

What is the class with the greatest frequency?

A) Very concerned
B) Somewhat concerned
C) No concern
D) None apply

78) Refer to the following breakdown of responses to a survey of "Are you concerned about being tracked while connected to the Internet?":

Response	Frequency
Very concerned	70
Somewhat concerned	80
No concern	40

What percentage of the responses indicated that users were somewhat concerned?

A) 80%
B) 35%
C) 42%
D) 100%

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79) Refer to the following breakdown of responses to a survey of "Are you concerned about being tracked while connected to the Internet?":

Response	Frequency
Very concerned	140
Somewhat concerned	40
No concern	20

What percentage of the responses indicated that users were somewhat concerned?

A) 40%
B) 70%
C) 20%
D) 100%

80) Refer to the following breakdown of responses to a survey of "Are you concerned about being tracked while connected to the Internet?"

Response	Frequency
Very concerned	140
Somewhat concerned	40
No concern	20

What type of chart should be used to describe the frequency table?

A) A pie chart
B) A bar chart
C) A histogram
D) A frequency polygon

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81) Refer to the following breakdown of responses to a survey of "Are you concerned about being tracked while connected to the Internet?"

Response	Frequency
Very concerned	140
Somewhat concerned	40
No concern	20

What type of chart should be used to show relative class frequencies?

A) A pie chart
B) A bar chart
C) A histogram
D) A frequency polygon

82) Refer to the following breakdown of responses to a survey of "How confident are you that you saved enough to retire?"

Response	Frequency
Very confident	63
Somewhat confident	135
Not very confident	99
Don't know	3

What is the class interval for the preceding frequency table?

A) 10
B) 20
C) 40
D) None apply

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83) Refer to the following breakdown of responses to a survey of "How confident are you that you saved enough to retire?"

Response	Frequency
Very confident	63
Somewhat confident	135
Not very confident	99
Don't know	3

What is the class with the greatest frequency?

A) Very confident
B) Somewhat confident
C) Not very confident
D) Don't know

84) Refer to the following breakdown of responses to a survey of "How confident are you that you saved enough to retire?":

Response	Frequency
Very confident	99
Somewhat confident	87
Not very confident	89
Don't know	25

What percentage of the responses indicated that users were very confident?

A) 99%
B) 33%
C) 29%
D) 45%

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85) Refer to the following breakdown of responses to a survey of "How confident are you that you saved enough to retire?":

Response	Frequency
Very confident	63
Somewhat confident	135
Not very confident	99
Don't know	3

What percentage of the responses indicated that users were very confident?

A) 63%
B) 21%
C) 45%
D) 33%

86) Refer to the following breakdown of responses to a survey of "How confident are you that you saved enough to retire?"

Response	Frequency
Very confident	63
Somewhat confident	135
Not very confident	99
Don't know	3

What type of chart should be used to describe the frequency table?

A) A pie chart
B) A bar chart
C) A histogram
D) A frequency polygon

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87) Refer to the following breakdown of responses to a survey of "How confident are you that you saved enough to retire?"

Response	Frequency
Very confident	63
Somewhat confident	135
Not very confident	99
Don't know	3

What type of chart should be used to show relative class frequencies?

A) A pie chart
B) A bar chart
C) A histogram
D) A frequency polygon

88) A pie chart shows the

A) relative frequencies of a qualitative variable.
B) relative frequencies of a quantitative variable.
C) frequencies of a nominal variable.
D) frequencies of a ratio variable.

89) A table summarizing a set of data showing the fraction of the total number of items in several classes is a

A) relative frequency table.
B) frequency table.
C) normal frequency table.
D) cumulative frequency table.

90) In order to convert class frequency to relative class frequency, we

A) divide the midpoint of the class by the sample size.
B) divide the frequency of the class by the midpoint.
C) divide the sample size by the frequency of the class.
D) divide the frequency of the class by the sample size.

91) In constructing a frequency distribution, the approximate class interval is computed as

A) (maximum value − minimum value)/(number of classes).
B) (maximum value − minimum value)/(sample size).
C) (minimum value − maximum value)/(sample size).
D) (maximum value)/(number of classes − sample size).

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92) What is the difference between a histogram and a bar chart?

A) There is no difference. Histograms and bar charts are interchangeable.
B) A histogram is used to display quantitative data and a bar chart is used to display qualitative data.
C) Histograms have distinct gaps between the bars and bar charts have no gaps between the bars.
D) Histograms are used to display categorical data, while bar charts are used to display numerical data.

93) Which of the following statements about histograms are true?

A) A histogram is used to display qualitative data.
B) A histogram has gaps between the bars.
C) The heights of the bars represent relative class frequencies.
D) The bars are drawn adjacent to each other because the data is continuous.

94) Which of the following statements about histograms are true?

A) A histogram has gaps between the bars.
B) Histograms are used to display discrete numerical data.
C) The heights of the bars represent class frequencies.
D) A histogram has gaps between the bars.

E) Histograms are used to display qualitative, categorical data.
F) The heights of the bars represent class frequencies.
G) Histograms are used to display qualitative, categorical data.

95) Which of the following statements about frequency polygons are true?

A) Frequency polygons do not show the shape of a distribution.
B) A frequency polygon is a graph of a bar chart.
C) The frequencies of each class are graphed at the midpoint of each class.
D) Frequency polygons represent each class as a rectangle.

96) Which of the following statements about frequency polygons are *FALSE*?

A) Frequency polygons allow us to directly compare two or more frequency distributions.
B) A frequency polygon is a graph of a frequency distribution.
C) The frequencies of each class are graphed at the midpoint of each class.
D) Frequency polygons do not show the shape of a distribution.

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97) Taylor Simmons owns an online store that sells small appliance parts. She wishes to see the percentage of sales revenue earned less than a particular amount for various parts sold in her shop. What type of display should she use for each part type?

A) Pie charts
B) Histograms
C) Cumulative frequency polygons
D) Frequency polygons

98) When constructing frequency distributions for continuous quantitative data, the first thing to determine is

A) the number of classes.
B) the class interval.
C) the individual class limits.
D) the number of observations in each class.

99) When determining the number of classes needed for graphing continuous data, a good place to start is with

A) the value halfway between the highest and lowest raw data value.
B) the "2 to the k rule."
C) converting raw data to an ordinal scale.
D) the "5 to the k rule."

100) The “2 to the k rule” is used

A) to determine the number of classes for graphing continuous data.
B) to determine the lowest category value on a graph.
C) to determine the category width.
D) to quickly count the number of observations in each category

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101) Assume that you have 55 data points, and a "2 to the k rule" table looks like the following:

k	2 to the kth
1	2
2	4
3	6
4	16
5	32
6	64
7	128
8	256

How many classes, or bars should you consider having for your frequency diagram?

A) 50
B) 10
C) 12
D) 6

102) When establishing the beginning point of a histogram, if your smallest value is 308 and your largest value is 4396, and you have 55 values, a good place to start your graph would be

A) 308.
B) 300.
C) 305.
D) 400.

103) When establishing a category width, assume that you have 55 raw data values, that you have determined to use 6 classes, the largest data value is 4396, and the smallest data value is 308. What class interval would you use?

A) 681
B) 700
C) 680
D) 450

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Answer Key

Test name: Chapter 02

1) FALSE
When one increases the number of classes, the category width is reduced.

2) FALSE
Classes in a frequency distribution may not overlap and must be mutually exclusive.

3) FALSE
Qualitative data are not numeric, so there cannot be class limits.

4) FALSE
Gender is a nominal, qualitative variable that has two values. Therefore, there will be only two classes: male and female.

5) TRUE
This is the definition of the term mutually exclusive.

6) TRUE
Bar charts set up with vertical bars will put the quantitative variable on the horizontal axis, while the frequency or counts will be on the vertical axis.

7) TRUE
Bar charts set up with vertical bars will put the quantitative variable on the horizontal axis, while the frequency or counts will be on the vertical axis.

8) TRUE
The midpoint is the center of each class. To find it, you add the lower and upper limits and divide by two.

9) TRUE
This is how one determines the class interval. One can also determine the class interval by subtracting the class midpoints from one class to the next class.

10) TRUE
Relative frequency is the class frequency divided by the sum or total of the class frequencies.

11) FALSE

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Relative frequencies are computed by dividing class frequencies by the total of the class frequencies.

12) TRUE
Pie charts are essentially visual representations of relative frequencies: these charts show the percentage or proportion of each class relative to the total frequency.

13) TRUE
Pie charts are essentially visual representations of relative frequencies: these charts show the percentage or proportion of each class relative to the total frequency.

14) TRUE
Pie charts visually represent the percentage or proportion of each class relative to the total. Relative frequencies are found by dividing the frequency of each class divided by the total frequency, which makes it a percentage or proportion of that total.

15) TRUE
A cumulative frequency distribution shows the number of values below a given value. If we know how many lie below that value, we can use this information to determine how many lie above that value.

16) TRUE
This is a major advantage of using frequency polygons because you can place the graphs on top of each other, something you can't do with histograms.

17) B
Histograms, frequency distributions, and frequency polygons all summarize data. The data in the question are individual observations or raw data that are not summarized.

18) D
Histograms and frequency distributions summarize data. The data in the question are the individual observations that are not summarized.

19) A
The statements "a pie chart can be used to summarize the data" and "the number of classes is equal to the number of variable values" refer to frequency distributions for qualitative variables. For quantitative, ratio variables, the number of classes, the class interval, and class limits must be computed.

20) B

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A pie chart is used to show the relative frequency for a qualitative, nominal, or ordinal variable. Class limits and rules for determining the number of classes apply to quantitative variables. To determine the number of classes for quantitative data, we use the 2 to the k rule (not the 5 to the k rule). With qualitative data, the number of classes is equal to the number of variables only.

21) C
Gender is a nominal, qualitative variable that has two values. Therefore, the frequency distribution will have only two classes: male and female.

22) B
In a frequency distribution, the classes must be mutually exclusive so that each data item can be assigned to only one class. In this example, the classes are not mutually exclusive because a female can be assigned to two classes: females, and females who smoke or females who do not smoke.

23) A
The variables are nominal and qualitative. The frequency table is best presented with a bar chart.

24) B
The variables are nominal and qualitative. Relative frequencies for a qualitative, nominal variable are best summarized with a pie chart.

25) C
Class intervals must be interpreted so they are mutually exclusive. The class interval, 100 up to 200, includes values equal to 100 and less than 200.

26) D
By definition, relative frequency is computed as class frequency divided by total frequency.

27) D
By definition, relative frequency is computed as class frequency divided by total frequency, which is a percentage of the total observations in a class.

28) A
For calculations, 30 of the 100 students have a high interest, or 30/100 = 0.30.

29) C
Interest is a qualitative, ordinal variable. The relative frequencies for a qualitative, ordinal variable are best summarized with a pie chart.

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30) B
($1,720 − 1,040)/7 = $97.14. Of the answer choices, a class interval of $100 is closest to $97.14.

31) D
The survey is not exhaustive because it does not include all possible party preferences, such as Independent or Libertarian.

32) A
Political preference is a qualitative, nominal variable. Frequencies for a qualitative, nominal variable are best presented with a bar chart.

33) B
Political preference is a qualitative, nominal variable. The relative frequencies for a qualitative, nominal variable are best summarized with a pie chart.

34) D
The table is not a graph, such as a histogram or a frequency polygon. The table shows the number of people in each class.

35) C
The frequency table has three classes with frequencies of 10, 70, and 20. The class 65" up to 70" corresponds with the greatest frequency of 70.

36) D
By definition, frequency is the number of observations in a class.

37) A
When constructing frequency distributions, sometimes there are extreme or outlier values. Therefore, there would be several classes with zero frequencies. To better summarize the data, a class would be created with extended limits that would include the classes with zero frequencies and all the outlier or extreme values.

38) B
The table shows the number of employees in each class or less. So each class frequency is a cumulative total and the table is a cumulative frequency distribution.

39) D
The frequency table has three classes with frequencies of 16, 42, and 10. The class $12 up to $15 corresponds with the smallest frequency of 10.

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40) C
The number 0.20 is found by 24/120. Here 120 is the total number of salespeople in the distribution (the sum of the class frequencies).

41) D
To plot a cumulative frequency distribution, the first point would show a frequency of zero (Y = 0) at the lower limit of the first class.

42) CFCF
The figure of 30.8%, or 37/120, is found by taking the total of the frequencies for $1,600 or more (24 + 9 + 4) and dividing by the total of 120.

43) B
The class with the greatest frequency is "1,400 up to 1,600." The class midpoint is the lower limit (1,400) plus one half of the class interval (1/2 × 200 = 100) or 1,400 + 100 = 1,500.

44) A
The class interval is 200, found by calculating the difference between any consecutive lower or upper class limits.

45) B
The class interval is $3, found by calculating the difference between any consecutive lower or upper class limits.

46) B
The class with the greatest frequency is "7 up to 10." The class midpoint is the lower limit (7) plus half of the class interval (1/2 × 3 = 1.5) or $7 + 1.5 = $8.50.

47) C
This class has the lowest frequency with 6 wage earners in the class.

48) C
The answer 0.20, or 10/50, is found by dividing 10 by the total of 50.

49) B
The class interval is 10, found by calculating the difference between any consecutive lower or upper class limits.

50) A

The highest class is "60 up to 70." The class midpoint is the lower limit (60) plus half of the class interval: ½ × 10 = 5, or $60 + 5 = 65.

51) D
The class interval can be computed as the difference between adjacent class midpoints (65.5 − 62.5 = 3).

52) A
Based on the class midpoints, the class interval is 3". The class limit for the lowest class would be the class midpoint less half of the class interval, or 80.5" − (½ × 3") = 79".

53) A
Based on the class midpoints, the class interval is 3". The class limit for the lowest class would be the class midpoint less half of the class interval, or 62.5" − (½ × 3") = 61".

54) C
Based on the class midpoints, the class interval is 3". The class limit for the lowest class would be the class midpoint less half of the class interval, or 74.5" − (½ × 3") = 73". Then adding the class interval, the lower limit of the second class would be 76" and the lower limit of the third class would be 79". Again, applying the class interval, the upper limit of the third class would be "up to 82"."

55) C
Based on the class midpoints, the class interval is 3". The class limit for the lowest class would be the class midpoint less half of the class interval, or 62.5" − (½ × 3") = 61". Then adding the class interval, the lower limit of the second class would be 64" and the lower limit of the third class would be 67". Again, applying the class interval, the upper limit of the third class would be "up to 70"."

56) B
The class frequency is divided by the total observations: 3/60 = 0.05.

57) B
The class frequency is divided by the total observations: 2/50 = 0.04.

58) C
The class midpoint is the lower limit ($58) plus half of the class interval: ½ × 10 = 5, or $58 + 5 = $63.

59) C

The class midpoint is the lower limit ($45) plus half of the class interval: ½ × 10 = 5, or $45 + 5 = $50.

60) C
The class with the highest frequency of 20 observations is "$65 up to $75."

61) C
The class with the highest frequency of 20 observations is "$55 up to $65."

62) A
From the chart, there are 43 employees who were absent 3 up to 6 days.

63) A
From the chart, there are 31 employees who were absent 3 up to 6 days.

64) C
To find the number of employees who were absent fewer than six days, add frequencies for the classes "0 up to 3" days and "3 up to 6" days, or 36 + 34 = 70.

65) C

To find the number of employees who were absent fewer than six days, add frequencies for the classes "0 up to 3" days and "3 up to 6" days, or 60 + 31 = 91.

66) C
To find the number of employees who were absent six or more days, add frequencies for the classes "6 up to 9" days and "9 up to 12" days and "12 up to 15" days, or 25 + 18 + 52 = 95.

67) C
To find the number of employees who were absent six or more days, add frequencies for the classes "6 up to 9" days and "9 up to 12" days and "12 up to 15" days, or 14 + 6 + 2 = 22.

68) A
To find the number of employees who were absent for "6 up to 12" days, add frequencies for the classes "6 up to 9" days and "9 up to 12" days, or 58 + 28 = 86.

69) A
To find the number of employees who were absent for "6 up to 12" days, add frequencies for the classes "6 up to 9" days and "9 up to 12" days, or 14 + 6 = 20.

70) D

There is no class interval for data measured on an ordinal scale.

71) C
The highly satisfied class has 60 people.

72) B
The answer (33%) is found by dividing the frequency of the satisfied class by the total frequency, or 40/120.

73) B
The answer (33%) is found by dividing the frequency of the satisfied class by the total frequency, or 40/120.

74) B
Bar charts can be used to illustrate a frequency table.

75) A
Pie charts can be used to illustrate relative frequencies for an ordinal variable.

76) D

There is no class interval for data measured on an ordinal scale.

77) A
The very concerned class has 140 people.

78) C
The answer (42%) is found by dividing the frequency of the somewhat concerned class by the total frequency, or 80/190.

79) C
The answer (20%) is found by dividing the frequency of the somewhat concerned class by the total frequency, or 40/200.

80) B
Bar charts can be used to illustrate a frequency table.

81) A
Pie charts can be used to illustrate relative frequencies for an ordinal variable.

82) D

There is no class interval for data measured on an ordinal scale.

83) B
The somewhat confident class with 135 people has the greatest frequency.

84) B
The answer (33%) is found by dividing the frequency of the very confident class by the total frequency, or 99/300.

85) B
The answer (21%) is found by dividing the frequency of the very confident class by the total frequency, or 63/300.

86) B
Bar charts can be used to illustrate a frequency table.

87) A
Pie charts can be used to illustrate relative frequencies for an ordinal variable.

88) A

Pie charts can be used to illustrate relative frequencies for qualitative variables.

89) A
To convert a frequency table to a relative frequency table, each of the class frequencies is divided by the total number of observations.

90) D
To convert a frequency table to a relative frequency table, each of the class frequencies is divided by the total number of observations.

91) A
The class interval is greater than or equal to the difference between the maximum and minimum values, divided by the number of classes, *k*. The reason is that all classes taken together must cover at least the distance between the minimum and maximum values in a data set.

92) B

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A histogram's classes represent groups of number ranges in a quantitative data set, while a bar chart's classes represent qualitative or attribute data. Histograms have bars that touch each other because the data being graphed is continuous and quantitative. The rectangles in a bar chart do not touch each other because they represent separate categories based on characteristics or attributes (i.e., qualitative variables).

93) D
Histograms have bars that touch each other because the data being graphed is continuous and quantitative. The heights of the bars represent class frequencies, not relative class frequencies.

94) CFCF
Histograms have bars that touch each other because the data being graphed is continuous and quantitative. The heights of the bars represent class frequencies. Bar charts are used to display qualitative, categorical data.

95) C
Frequency polygons are a graph of a frequency distribution, so they are for quantitative data only. They consist of line segments connecting the points formed by the intersections of the class midpoints and the class frequencies. Histograms, not frequency polygons, represent each class as a rectangle.

96) D
Frequency polygons are a graph of a frequency distribution. They consist of line segments connecting the points formed by the intersections of the class midpoints and the class frequencies. This allows us to directly compare two or more frequency distributions on the same graph. By looking at the heights of the points graphed, one can see the shape of the distribution.

97) C
Pie charts are used for qualitative data, so they would not be appropriate for quantitative data like sales revenue. Histograms and frequency polygons would be used to display the frequencies of various classes of sales revenue earned. A cumulative frequency polygon, however, would show the cumulative relative frequency or the percent of sales revenue earned below each class.

98) A
With continuous qualitative data, the desired number of classes, or bars on a frequency diagram, must first be determined.

99) B

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To determine the number of classes for quantitative data, use the 2 to the k rule (not the 5 to the k rule). With qualitative data, the number of classes is equal to the number of variables.

100) A

To determine the number of classes for quantitative data, use the 2 to the k rule. This calculates a good place to start for the number of classes.

101) D

The first "2 to the kth" value that is greater than 55 is 64, for a k value of 6. So the recommended number of classes is 6.

102) B

It is recommended to begin your graph with a value smaller than your smallest raw data value, and one that is easy for humans to read, and appropriate for the range of raw data.

103) B

Use the equation (Max value − Min value)/# classes, which calculate to 681.33. In practice, this interval size is usually rounded up to some convenient number, such as a multiple of 10 or 100. The value of 700 is a reasonable choice.