1) _____ refers to a collection of quantitative measures and ways of describing data.
A) Statistical inference
B) Descriptive statistics
C) Frequency distribution
D) Categorical data
Answer: B

2) All of the following are examples of measures of central tendency except _____.
A) mean
B) median
C) standard deviation
D) mode
Answer: C

3) All of the following are examples of measures of dispersion except _____.
A) range
B) variance
C) standard deviation
D) mode
Answer: D

4) In Microsoft Excel 2010, the function that computes the standard deviation of a set of data, assumed to be a sample, is _____.
A) STDEV.P(*data range*)
B) MODE.SNGL(*data range*)
C) STAND.MULT(*data range*)
D) STDEV.S(*data range*)
Answer: D

5) In Microsoft Excel 2010, the function that computes the standard deviation of a set of data, assumed to be a population, is _____.
A) STDEV.S(*data range*)
B) STAND.SNGL(*data range*)
C) STDEV.P(*data range*)
D) STAND.MULT(*data range*)
Answer: C

6) In Microsoft Excel 2010, the function that computes the single most frequently occurring value in a set of data is _____.
A) MEDIAN(*data range*)
B) MODE.SNGL(*data range*)
C) STDEV.P(*data range*)
D) SKEW(*data range*)
Answer: B

7) Using Microsoft Excel 2010, the function that computes the most frequently occurring values of a set of data is _____.
A) MODE.SNGL(*data range*)
B) MEDIAN(*data range*)
C) STDEV.P(*data range*)
D) MODE.MULT(*data range*)
Answer: D

8) A table that shows the number of observations in each of several nonoverlapping groups is called a _____.
A) frequency distribution
B) scatter plot
C) histogram
D) chart
Answer: A

9) The sum of relative frequencies will always equal _____.
A) 100
B) 1.0
C) 10
D) 0.01
Answer: B

10) A graphical depiction of a frequency distribution for numerical data in the form of a column chart is called a _____.
A) scatter plot
B) box-and-whisker plot
C) pie chart
D) histogram
Answer: D

11) The proportion of the total sample that falls at or below the upper limit value is represented by _____.
A) dispersion
B) cumulative relative frequency
C) median
D) standard deviation
Answer: B

12) The _____ is a value at or below which at least k percent of the observations lie.
A) k^{th} percentile
B) k^{th} ratio

C) k^{th} quartile
D) k^{th} mean
Answer: A

13) The formula to calculate k^{th} percentile is given by _____.
A) $100/Nk + 0.05$
B) $100/Nk - 0.05$
C) $Nk/100 + 0.05$
D) $Nk/100 - 0.05$
Answer: C

14) _____ is the quartile representing the 25^{th} percentile.
A) Q1
B) Q2
C) Q3
D) Q4
Answer: A

15) _____ is the quartile representing the 50^{th} percentile.
A) Q1
B) Q2
C) Q3
D) Q4
Answer: B

16) _____ is the quartile representing the 75^{th} percentile.
A) Q1
B) Q2
C) Q3
D) Q4
Answer: C

17) _____ is the quartile representing the 100^{th} percentile.
A) Q1
B) Q2
C) Q3
D) Q4
Answer: D

18) One-fourth of the data falls below the _____ quartile.
A) fourth
B) second
C) first
D) third
Answer: C

19) Three-fourths of the data fall below the _____ quartile.
A) fourth
B) second
C) first
D) third
Answer: D

20) The _____ is the sum of all observations divided by the number of observations.
A) arithmetic mean
B) median
C) mode
D) midrange
Answer: A

21) The _____ is the middle value when the data are arranged from smallest to largest.
A) mode
B) median
C) midrange
D) arithmetic mean
Answer: B

22) The _____ is the observation that occurs the most frequently in the data set.
A) arithmetic mean
B) median
C) mode
D) midrange
Answer: C

23) The _____ is the average of the largest and smallest values in the data set.
A) arithmetic mean
B) median
C) mode
D) midrange
Answer: D

24) An observation that is radically different from the rest is called _____.
A) the median
B) the mean
C) an outlier
D) the mode
Answer: C

25) The population mean is represented by _____.
A) α
B) μ
C) λ
D) π
Answer: B

26) The sample mean is represented by _____.
A) $\bar{x}$
B) α
C) μ
D) η
Answer: A

27) The midrange for a data set containing all the values between 50 and 67 is _____.
A) 67
B) 58.5
C) 50
D) -17
Answer: B

28) The degree of variation in or the numerical spread of the data is known as _____.
A) quartile
B) median
C) dispersion
D) mean
Answer: C

29) Which of the following can be used to represent dispersion in a data set?
A) proportion
B) range
C) mode
D) median
Answer: B

30) Which of the following provides an estimate that represents "centering" of the entire set of data?
A) range
B) variance
C) midrange
D) standard deviation
Answer: C

31) Computing the difference between the maximum value and the minimum value gives the _____ of the data set.
A) variance
B) standard deviation
C) range
D) median
Answer: C

32) The range of the middle 50% of the data is called the _____.
A) midrange
B) interquartile range
C) variance
D) mode
Answer: B

33) The sample variance is denoted as _____.
A) s^2
B) v^2
C) σ^2
D) α^2
Answer: A

34) The population variance is denoted as _____.
A) s^2
B) v^2
C) σ^2
D) α^2
Answer: C

35) The square root of the variance is called the _____.
A) mean
B) standard deviation
C) median
D) interquartile range
Answer: B

36) The standard deviation for the population is denoted as _____.
A) μ
B) Ω
C) s
D) σ
Answer: D

37) The standard deviation for a sample is denoted as _____.
A) μ
B) Ω
C) s
D) σ
Answer: C

38) Which of the following state(s) that for any set of data, the proportion of values that lie within k standard deviations (k>1) of the mean is at least $1 - 1/k^2$?
A) empirical rules
B) interquartile range
C) Chebyshev's theorem
D) standard deviation
Answer: C

39) Using Chebyshev's theorem, k = 2 would mean that _____.
A) at least two-thirds of the data lie within two standard deviations of the mean
B) at least 89% of the data lie within two standard deviations of the mean
C) less than three-fourths of the data lie within three standard deviations of the mean
D) at least three-fourths of the data lie within two standard deviations of the mean
Answer: D

40) Using Chebyshev's theorem, k = 3 means that _____.
A) at least two-thirds of the data lie within three standard deviations of the mean
B) at least 89% of the data lie within three standard deviations of the mean
C) less than 29% of the data lie within three standard deviations of the mean
D) at least three-fourths of the data lie within two standard deviations of the mean
Answer: B

41) Which of the following is included in the empirical rules?
A) Approximately 59% of the observations will fall within two standard deviations of the mean, or within $x \pm 2s$.
B) Approximately 68% of the observations will fall within one standard deviation of the mean, or between $x - s$ and $x + s$.
C) Approximately 89% of the observations will fall within three standard deviations of the mean, or within $x \pm 3s$.
D) Approximately 28% of the observations will fall within three standard deviations of the mean, or within $x \pm 3s$.
Answer: B

42) According to the empirical rules, approximately 99.7% of the observations will fall within _____.
A) one standard deviation of the mean
B) two standard deviations of the mean
C) three standard deviations of the mean
D) four standard deviations of the mean
Answer: C

43) According to the empirical rules, approximately 95% of the observations will fall within _____.
A) one standard deviation of the mean
B) two standard deviations of the mean
C) three standard deviations of the mean
D) four standard deviations of the mean
Answer: B

44) The _____ is used to compare the variability of two or more data sets with different scales.
A) coefficient of variation
B) variance
C) median
D) coefficient of skewness
Answer: A

45) The coefficient of variation (CV) is calculated as _____.
A) mode/standard deviation
B) standard deviation/mean
C) standard deviation/variance
D) range/standard deviation
Answer: B

46) Given that the standard deviation is equal to 0.568, the median equals 5, and the mean value is 3.5, what is the value of the coefficient of variation?
A) 0.1136
B) 0.162
C) 6.16
D) 0.7
Answer: B

47) When more of the mass of the data is concentrated on one side and the distribution of values tails off to the other side, the histogram is said to be _____.
A) symmetric
B) skewed
C) curved
D) positively sloped
Answer: B

48) When a histogram is positively skewed, it _____.
A) tails off to the right
B) is symmetrical
C) tails off to the left
D) has a slope greater than one
Answer: A

49) When a histogram is negatively skewed, it _____.
A) is symmetrical

B) tails off to the left
C) has a slope lesser than one
D) tails off to the right
Answer: B

50) The degree of asymmetry of observations around the mean is measured by the _____.
A) coefficient of correlation
B) coefficient of symmetry
C) coefficient of skewness
D) coefficient of deviation
Answer: C

51) Which of the following coefficients of skewness values has the lowest degree of skewness?
A) 1
B) 1.1
C) 0.5
D) 0.05
Answer: D

52) A coefficient of skewness that indicates relative symmetry would lie between _____.
A) 0.5 and -0.5
B) 5 and -5
C) 1 and -1
D) 0.95 and 1
Answer: A

53) A coefficient of skewness that indicates moderate skewness would lie between _____.
A) 1 and 2
B) 0.5 and 1
C) 0 and 1
D) 0.5 and -0.5
Answer: B

54) A histogram with only one peak _____.
A) does not have a mode value
B) is unimodal
C) is bimodal
D) has a high degree of kurtosis
Answer: B

55) A histogram with exactly two peaks _____.
A) is unimodal
B) has a low degree of kurtosis
C) has the same values for mean and mode
D) is bimodal
Answer: D

56) If the distribution of observations were perfectly symmetrical and unimodal, _____.
A) the mean would be greater than the mode
B) the mean, median, and mode would be the same
C) the mode would be lesser than the median
D) the median would be greater than the mean
Answer: B

57) The degree of flatness or peakedness of a population is measured by the _____.
A) coefficient of kurtosis
B) coefficient of skewness
C) coefficient of variation
D) coefficient of deviation
Answer: A

58) A distribution that is relatively flat with a wide degree of dispersion has a coefficient of kurtosis that is _____.
A) more than 3
B) less than 3
C) less than 6
D) more than 6
Answer: B

59) A distribution that is relatively peaked with a low degree of dispersion has a coefficient of kurtosis that is _____.
A) equal to 0
B) less than 0
C) more than 3
D) equal to 3
Answer: C

60) _____ is a measure of a linear relationship between two variables.
A) Variance
B) Proportion
C) Correlation
D) Kurtosis
Answer: C

61) The correlation coefficient is a number between _____.
A) 0 and +1
B) -1 and 0
C) -1 and +1
D) -2 and +2
Answer: A

62) The correlation coefficient for two variables that are not linearly related will be equal to _____.
A) 1
B) 2
C) 0
D) 3
Answer: C

63) What does a positive correlation coefficient indicate?
A) When one variable increases, the other variable decreases.
B) When one variable increases, the other variable also increases.
C) When one variable decreases, the other variable remains constant.
D) Both the variables are not linearly related.
Answer: B

64) What does a negative correlation coefficient indicate?
A) When one variable increases, the other variable decreases.
B) There is a nonlinear relationship between the two variables.
C) When one variable increases, the other variable increases by a smaller proportion.
D) A change in one variable does not lead to a change in the other variable.
Answer: A

65) The formal statistical measure for categorical data is called the _____.
A) sample mean
B) sample median
C) sample mode
D) sample proportion
Answer: D

66) Sample proportion is usually denoted as _____.
A) sp
B) p
C) $p2$
D) s
Answer: B

67) The subcategories of the variables in a contingency table must _____.
A) be mutually exclusive
B) sum up to a total of 1
C) be arranged in ascending order
D) lie between 0 and 1
Answer: A

for Categorical Data

68) A _____ displays the minimum, first quartile, median, third quartile, and maximum of a data set.
A) scatter plot
B) contingency table
C) box plot
D) stacked column chart
Answer: C

Topic: Visual Display of Statistical Measures

69) In a box-and-whisker plot, the whiskers represent the _____.
A) Q_1 and Q_3
B) minimum and maximum values
C) median and mode
D) cumulative frequencies
Answer: B

Topic: Visual Display of Statistical Measures

70) In a box plot, the outer boundaries of the box represent the _____.
A) interquartile range
B) median and mode
C) minimum and maximum
D) outlier values
Answer: A

Topic: Visual Display of Statistical Measures

71) In a box plot, the line inside the box represents the _____.
A) mean
B) median
C) mode
D) range
Answer: B

Topic: Visual Display of Statistical Measures

72) Outliers defined as being between 1.5*IQR and 3*IQR to the left of Q_1 or to the right of Q_3 are considered _____.
A) weak
B) extreme
C) mild
D) statistically significant
Answer: C

Topic: Visual Display of Statistical Measures

73) Outliers defined as being more than 3*IQR away from Q_1 and Q_3 are considered _____.
A) mild
B) extreme
C) weak
D) irrelevant
Answer: B

Topic: Visual Display of Statistical Measures

74) Which of the following is true of outliers in a data set?
A) All outliers should be eliminated in order to portray accurate information.
B) Outliers that are within 1 standard deviation of the mean must be eliminated.
C) The mean and range are sensitive to outliers in the data.
D) Outliers do not make any difference in the results obtained from statistical analyses.
Answer: C

Topic: Visual Display of Statistical Measures

75) Pivot tables can be used to create _____.
A) dot-scale diagrams.
B) box-and-whisker plots.
C) cross-tabulations for categorical data.
D) scatter plots.
Answer: C

Topic: Data Analysis Using Pivot tables

76) Frequency distributions can only be constructed for numerical data.
Answer: FALSE

77) The sum of relative frequencies must equal 100.
Answer: FALSE

78) The cumulative relative frequency represents the proportion of the total sample that falls at or below the upper limit value.
Answer: TRUE

79) Point estimates that accurately represent population parameters are called outliers.
Answer: FALSE

80) The standard deviation is the square root of the variance.
Answer: TRUE

81) The formula used for calculating the variance of a population is different from that used for calculating the variance of a sample.
Answer: TRUE

82) A negative correlation coefficient indicates a linear relationship between variables where one variable increases as the other increases.
Answer: FALSE

83) Statistics such as means and variances are not appropriate for categorical data.
Answer: TRUE

84) Box-and-whisker plots graphically display five key statistics of a data set: the minimum, first quartile, mean, third quartile, and maximum.
Answer: FALSE

85) Box plots and dot-scale diagrams can help identify possible outliers visually.
Answer: TRUE

86) For a stock that displays a large standard deviation, the returns may be high but risk is high too.
Answer: TRUE

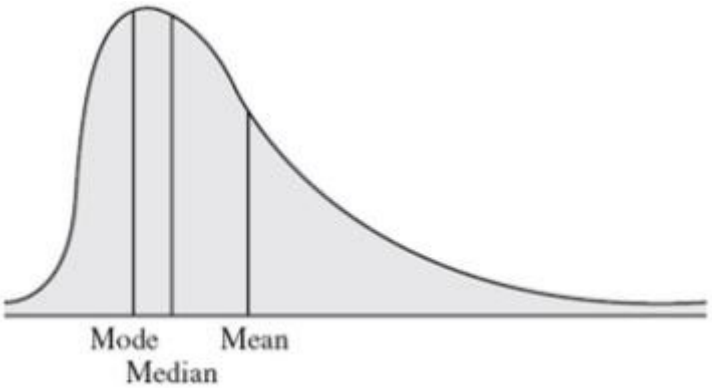
87) According to the empirical rules, approximately 38% of the observations will fall within two standard deviations of the mean.
Answer: FALSE

88) The coefficient of variation (CV) provides a relative measure of the dispersion in data relative to the mean.
Answer: TRUE

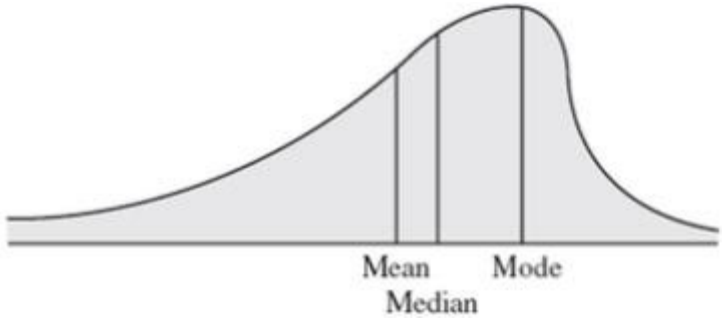
89) For a negatively skewed distribution, the mode is greater than the median, which is greater than the mean.
Answer: TRUE

90) The higher the kurtosis, the more area the histogram has in the middle rather than in the tails.
Answer: FALSE

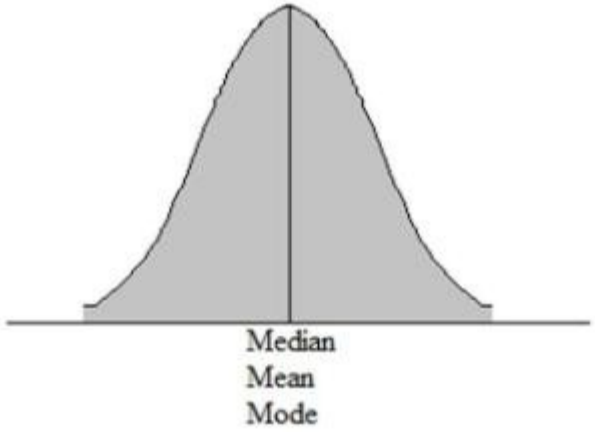
91) Sketch a positively skewed distribution.
Answer:



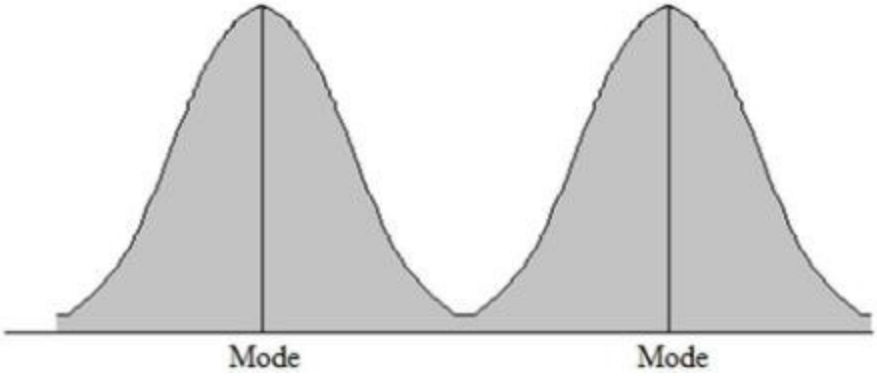
92) Sketch a negatively skewed distribution.
Answer:



93) Sketch a perfectly symmetrical and unimodal distribution.
Answer:



94) Sketch a bimodal distribution.
Answer:



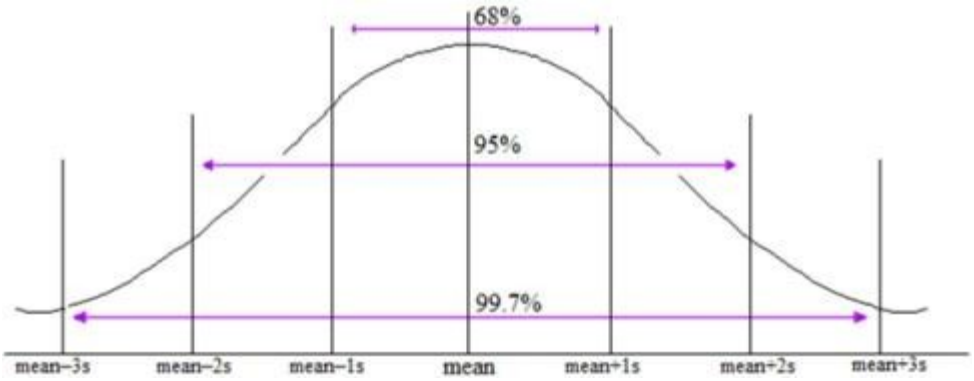
Use the table below to answer the following question(s). The table shows the crude oil prices in dollars per barrel, for 2007.

Jan: $54.63	Feb: $52.11	Mar: $57.83
Apr: $64.93	May: $63.40	Jun: $65.37
Jul: $69.91	Aug: $73.81	Sep: $71.42
Oct: $75.57	Nov: $86.02	Dec: $85.91

95) Calculate the mean price of crude oil in 2007.
Answer: $68.41

96) Locate the median price of crude oil in 2007.
Answer: $67.64

97) Sketch a normal distribution and label the sections of the empirical rules.
Answer:



According to the empirical rules:
1. Approximately 68% of the observations will fall within one standard deviation of the mean.
2. Approximately 95% of the observations will fall within two standard deviations of the mean.
3. Approximately 99.7% of the observations will fall within three standard deviations of the mean.

98) Explain Chebyshev's theorem.
Answer: Chebyshev's theorem states that for any set of data, the proportion of values that lie within k standard deviations ($k > 1$) of the mean is at least $1 - 1/k^2$. Thus, for $k = 2$ at least three-fourths of the data lie within two standard deviations of the mean; for $k = 3$ at least $\frac{8}{9}$, or 89%, of the data lie within three standard deviations of the mean.

99) List three statistical measures that characterize dispersion.
Answer: Range is the difference between the maximum and minimum values in a data set and measures how spread out the data is. Variance involves all the values in the data set and measures how spread out the data is around the mean. The third measure is the standard deviation, which is defined as the square root of the variance.