Exam

Name_____

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

Solve the problem.

1) Which of the following is not the job of a statistician?   1) _____
   A) determining whether the conclusions drawn from a study are to be trusted
   B) determining what information is relevant in a given problem
   C) collecting numerical information in the form of data
   D) implementing new procedures based on the results of a study

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

2) What is statistics?   2) _____

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

3) A recent report stated "Based on a sample of 180 truck drivers, there is evidence to indicate that, on   3) _____
   average, independent truck drivers earn more than company-hired truck drivers." Does this
   statement describe descriptive or inferential statistics?
   A) Inferential statistics   B) Descriptive statistics

4) A survey of high school teenagers reported that 79% of those sampled are interested in pursuing a   4) _____
   college education. Does this statement describe descriptive or inferential statistics?
   A) Inferential statistics   B) Descriptive statistics

5) The average age of the students in a statistics class is 22 years. Does this statement describe   5) _____
   descriptive or inferential statistics?
   A) Descriptive statistics   B) Inferential statistics

6) From past figures, it is predicted that 44% of the registered voters will vote in the March primary.   6) _____
   Does this statement describe descriptive or inferential statistics?
   A) Inferential statistics   B) Descriptive statistics

7) Parking at a large university has become a very big problem. University administrators are   7) _____
   interested in determining the average parking time (e.g. the time it takes a student to find a parking
   spot) of its students. An administrator inconspicuously followed 250 students and carefully
   recorded their parking times. The university is interested in using the information from the sample
   of 250 students collected to learn information about the entire student parking population. Would
   this be an application of descriptive or inferential statistics?
   A) Descriptive statistics   B) Inferential statistics

8) As part of an economics class project, students were asked to randomly select 500 New York Stock   8) _____
   Exchange (NYSE) stocks from the Wall Street Journal. As part of the project, students were asked to
   summarize the current prices (also referred to as the closing price of the stock for a particular
   trading date) of the collected stocks using graphical and numerical techniques. Would this be an
   application of descriptive or inferential statistics?
   A) Descriptive statistics   B) Inferential statistics

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SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

9) In a survey of 1000 high school students, 14% of those surveyed read at least one   9) _____
best-seller each month. Give an example of a descriptive statement and an inferential
statement that could be made based on this information.

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

10) Which of the following is not an element of descriptive statistical problems?   10) _____
    A) predictions are made about a larger set of data
    B) information revealed in a data set is summarized
    C) patterns in a data set are identified
    D) data are displayed visually in graphs

Answer the question True or False.

11) When we take data obtained from a sample and make generalizations or predictions about the   11) _____
entire population, we are utilizing inferential statistics.
    A) True   B) False

12) Statistics involves two different processes, describing sets of data and drawing conclusions about   12) _____
the sets of data on the basis of sampling.
    A) True   B) False

Solve the problem.

13) Parking at a university has become a problem. University administrators are interested in   13) _____
determining the average time it takes a student to find a parking spot. An administrator
inconspicuously followed 100 students and recorded how long it took each of them to find a
parking spot. Identify the population of interest to the university administration.
    A) the students who park at the university between 9 and 10 AM on Wednesdays
    B) the 100 students about whom the data were collected
    C) the entire set of students who park at the university
    D) the entire set of faculty, staff, and students who park at the university

14) Parking at a university has become a problem. University administrators are interested in   14) _____
determining the average time it takes a student to find a parking spot. An administrator
inconspicuously followed 300 students and recorded how long it took each of them to find a
parking spot. Identify the variable of interest to the university administration.
    A) time to find a parking spot
    B) students who drive cars on campus
    C) number of students who cannot find a spot
    D) number of empty parking spots

15) An assembly line is operating satisfactorily if fewer than 6% of the phones produced per day are   15) _____
defective. To check the quality of a day's production, the company randomly samples 50 phones
from a day's production to test for defects. Define the population of interest to the manufacturer.
    A) the 6% of the phones that are defective
    B) the 50 responses: defective or not defective
    C) all the phones produced during the day in question
    D) the 50 phones sampled and tested

16) An insurance company conducted a study to determine the percentage of cardiologists who had been sued for malpractice in the previous seven years. The sample was randomly chosen from a national directory of doctors. What is the variable of interest in this study?
 A) the doctor's area of expertise (i.e., cardiology, pediatrics, etc.)
 B) all cardiologists in the directory
 C) the number of doctors who are cardiologists
 D) the responses: have been sued/have not been sued for malpractice in the last seven years

16) _____

17) A study attempted to estimate the proportion of Florida residents who were willing to spend more tax dollars on protecting the Florida coastline from environmental disasters. Forty-five hundred Florida residents were surveyed.Which of the following is the population used in the study?
 A) all Florida residents who lived along the coastline
 B) all Florida residents
 C) the 4500 Florida residents who were surveyed
 D) Florida residents willing to spend more tax dollars protecting the coastline from environmental disasters

17) _____

18) A study attempted to estimate the proportion of Florida residents who were willing to spend more tax dollars on protecting the Florida beaches from environmental disasters. Twenty-three hundred Florida residents were surveyed.Which of the following describes the variable of interest in the study?
 A) the response to the question "Do you use the beach?"
 B) the response to the question "Do you live along the beach?"
 C) the 2300 Florida residents surveyed
 D) the response to the question, "Are you willing to spend more tax dollars on protecting the Florida beaches from environmental disasters?"

18) _____

19) Parking at a large university has become a very big problem. University administrators are interested in determining the average parking time (e.g. the time it takes a student to find a parking spot) of its students. An administrator inconspicuously followed 250 students and carefully recorded their parking times. Identify the population of interest to the university administration.
 A) the 250 students that data was collected from
 B) a single student that parks at the university
 C) the parking time, defined to be the amount of time the student spent finding a parking spot
 D) the entire set of students that park at the university

19) _____

20) Parking at a large university has become a very big problem. University administrators are interested in determining the average parking time (e.g. the time it takes a student to find a parking spot) of its students. An administrator inconspicuously followed 250 students and carefully recorded their parking times. Identify the sample of interest to the university administration.
 A) the entire set of students that park at the university
 B) the parking time, defined to be the amount of time the student spent finding a parking spot
 C) the 250 students that data was collected from
 D) a single student that parks at the university

20) _____

21) Parking at a large university has become a very big problem. University administrators are interested in determining the average parking time (e.g. the time it takes a student to find a parking spot) of its students. An administrator inconspicuously followed 250 students and carefully recorded their parking times. Identify the experimental unit of interest to the university administration.

   A) a single student that parks at the university
   B) the 250 students that data was collected from
   C) the parking time, defined to be the amount of time the student spent finding a parking spot
   D) the entire set of students that park at the university

22) Parking at a large university has become a very big problem. University administrators are interested in determining the average parking time (e.g. the time it takes a student to find a parking spot) of its students. An administrator inconspicuously followed 250 students and carefully recorded their parking times. Identify the variable of interest to the university administration.

   A) a single student that parks at the university
   B) the 250 students that data was collected from
   C) the parking time, defined to be the amount of time the student spent finding a parking spot
   D) the entire set of students that park at the university

23) As part of an economics class project, students were asked to randomly select 500 New York Stock Exchange (NYSE) stocks from the Wall Street Journal. As part of the project, students were asked to summarize the current prices (also referred to as the closing price of the stock for a particular trading date) of the collected stocks using graphical and numerical techniques. Identify the population of interest for this study.

   A) the 500 NYSE stocks that current prices were collected from
   B) the entire set of stocks that are traded on the NYSE
   C) the current price (or closing price) of a NYSE stock
   D) a single stock traded on the NYSE

24) As part of an economics class project, students were asked to randomly select 500 New York Stock Exchange (NYSE) stocks from the Wall Street Journal. As part of the project, students were asked to summarize the current prices (also referred to as the closing price of the stock for a particular trading date) of the collected stocks using graphical and numerical techniques. Identify the sample of interest for this study.

   A) the entire set of stocks that are traded on the NYSE
   B) the current price (or closing price) of a NYSE stock
   C) the 500 NYSE stocks that current prices were collected from
   D) a single stock traded on the NYSE

25) As part of an economics class project, students were asked to randomly select 500 New York Stock Exchange (NYSE) stocks from the Wall Street Journal. As part of the project, students were asked to summarize the current prices (also referred to as the closing price of the stock for a particular trading date) of the collected stocks using graphical and numerical techniques. Identify the experimental unit of interest for this study.

   A) a single stock traded on the NYSE
   B) the current price (or closing price) of a NYSE stock
   C) the 500 NYSE stocks that current prices were collected from
   D) the entire set of stocks that are traded on the NYSE

26) As part of an economics class project, students were asked to randomly select 500 New Your Stock Exchange (NYSE) stocks from the Wall Street Journal. As part of the project, students were asked to summarize the current prices (also referred to as the closing price of the stock for a particular trading date) of the collected stocks using graphical and numerical techniques. Identify the variable of interest for this study.

    A) the 500 NYSE stocks that current prices were collected from
    B) the current price (or closing price) of a NYSE stock
    C) a single stock traded on the NYSE
    D) the entire set of stocks that are traded on the NYSE

26) _____

27) A study in the state of Georgia was conducted to determine the percentage of all community college students who have taken at least one online class. 1500 community college students were contacted and asked if they had taken at least one online class during their time at their community college. These responses were then used to estimate the percentage of all community college students who have taken at least one online class. Identify the population of interest in this study.

    A) the number of online classes a student has taken
    B) the response (Yes/No) to the question, "Have you taken at least one online class?"
    C) all community college students in the state of Georgia
    D) the 1500 community college students contacted

27) _____

28) A study in the state of Georgia was conducted to determine the percentage of all community college students who have taken at least one online class. 1500 community college students were contacted and asked if they had taken at least one online class during their time at their community college. These responses were then used to estimate the percentage of all community college students who have taken at least one online class. Identify the variable of interest in this study.

    A) the response (Yes/No) to the question, "Have you taken at least one online class?"
    B) the number of online classes a student has taken
    C) the 1500 community college students contacted
    D) all community college students in the state of Georgia

28) _____

29) Which of the following is not typically an element of inferential statistical problems?

    A) sample   B) variable of interest
    C) census   D) measure of reliability

29) _____

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

30) Parking at a university has become a problem. University administrators are interested in determining the average time it takes a student to find a parking spot. An administrator inconspicuously followed 110 students and recorded how long it took each of them to find a parking spot. Identify the population, sample, and variable of interest to the administrators.

30) _____

31) A quality inspector tested 71 copiers in an attempt to estimate the average failure rate of the copier model. His study indicated that the number of failures decreased from two years ago, indicating an increase in the reliability of the copiers. Describe the variable of interest to the inspector.

31) _____

32) A high school guidance counselor analyzed data from a sample of 700 community colleges throughout the United States. One of his goals was to estimate the annual tuition costs of community colleges in the United States. Describe the population and variable of interest to the guidance counselor.

32) _____

33) Explain why it is not necessary to provide a measure of reliability when a census is used rather than a sample.

33) _____

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

Answer the question True or False.

34) A variable is a characteristic or property of a population.

    A) True   B) False

34) _____

35) Measurement is the process of assigning numbers to variables of individual population units.

    A) True   B) False

35) _____

36) A census is feasible when the population of interest is small.

    A) True   B) False

36) _____

37) The process of using information from a sample to make generalizations about the larger population is called statistical inference.

    A) True   B) False

37) _____

38) A measure of reliability is an important element of a descriptive statistical problem.

    A) True   B) False

38) _____

Solve the problem.

39) The amount of television viewed by today's youth is of primary concern to Parents Against Watching Television (PAWT). 250 parents of elementary school-aged children were asked to estimate the number of hours per week that their child watches television. Identify the type of data collected by PAWT.

    A) quantitative   B) qualitative

39) _____

40) The manager of a car dealership records the colors of automobiles on a used car lot. Identify the type of data collected.

    A) qualitative   B) quantitative

40) _____

41) A postal worker counts the number of complaint letters received by the United States Postal Service in a given day. Identify the type of data collected.

    A) quantitative   B) qualitative

41) _____

42) An usher records the number of unoccupied seats in a movie theater during each viewing of a film. Identify the type of data collected.

    A) qualitative   B) quantitative

42) _____

43) A fan observes the numbers on the shirts of a girl's soccer team. Identify the type of data collected.

    A) qualitative   B) quantitative

43) _____

44) Parking at a large university has become a very big problem. University administrators are interested in determining the average parking time (e.g. the time it takes a student to find a parking spot) of its students. An administrator inconspicuously followed 250 students and carefully recorded their parking times. What type of variable is the administration interested in collecting?

    A) qualitative data   B) quantitative data

44) _____

45) As part of an economics class project, students were asked to randomly select 500 New York Stock Exchange (NYSE) stocks from the Wall Street Journal. As part of the project, students were asked to summarize the current prices (also referred to as the closing price of the stock for a particular trading date) of the collected stocks using graphical and numerical techniques. What type of variable is being collected?

A) quantitative data   B) qualitative data

45) _____

46) A study in the state of Georgia was conducted to determine the percentage of all community college students who have taken at least one online class. 1500 community college students were contacted and asked if they had taken at least one online class during their time at their community college. These responses were then used to estimate the percentage of all community college students who have taken at least one online class. What type of variable is being collected?

A) qualitative data   B) quantitative data

46) _____

47) Which data about paintings would *not* be qualitative?

A) the theme   B) the style   C) the artist   D) the value

47) _____

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

48) Gender is one variable of interest in a study of the effectiveness of a new medication. For data entry purposes, the researcher conducting the study assigns 1 for Male and 2 for Female. Is the gender data quantitative or qualitative?

48) _____

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

49) The amount of television viewed by today's youth is of primary concern to Parents Against Watching Television (PAWT). 330 parents of elementary school-aged children were asked to estimate the number of hours per week that their child watches television. Identify how the data were collected in this study.

A) from a published source   B) from a designed experiment
C) observationally   D) from a survey

49) _____

50) A personnel director studied the eating habits of a company's employees. The director noted whether employees brought their own lunch to work, ate at the company cafeteria, or went out to eat lunch. This type of data collection would best be considered as a(n) _____.

A) designed experiment   B) observational study

50) _____

51) A student worked on her statistics project in the library and found a reference book that contained the median family incomes for all 50 states. On her project, she would report her data as being collected _____.

A) from a designed experiment   B) from a survey
C) observationally   D) from a published source

51) _____

52) What method of data collection would you use to collect data for a study where a drug was given to 38 patients and a placebo to another group of 38 patients to determine if the drug has an effect on a patient's illness?

A) published source   B) survey
C) designed experiment   D) observational study

52) _____

53) What method of data collection would you use to collect data for a study where a political pollster 53) _____
wishes to determine if his candidate is leading in the polls?
　　A) observational study　　　　　　　　　　B) designed experiment
　　C) published source　　　　　　　　　　　D) survey

54) Parking at a large university has become a very big problem. University administrators are 54) _____
interested in determining the average parking time (e.g. the time it takes a student to find a parking
spot) of its students. An administrator inconspicuously followed 250 students and carefully
recorded their parking times. Identify the data collection method used by the administration in this
study.
　　A) data collected observationally
　　B) data from a designed experiment
　　C) data from a published source

55) As part of an economics class project, students were asked to randomly select 500 New York Stock 55) _____
Exchange (NYSE) stocks from the Wall Street Journal. As part of the project, students were asked to
summarize the current prices (also referred to as the closing price of the stock for a particular
trading date) of the collected stocks using graphical and numerical techniques. Identify the data
collection method used in this study.
　　A) data from a published source
　　B) data collected observationally
　　C) data from a designed experiment

56) Does online teaching help or hinder student learning? To help answer this question, a statistics 56) _____
teacher decided to teach his three sections of a particular class using three different teaching models
- a traditional face-to-face section, a completely online section, and a hybrid or blended section
that incorporated both a face-to-face and online component in the section. Students were
randomly assigned to the different sections, taught identical information using the different
teaching formats, and given identical examinations to measure student learning. The goal was to
identify if the teaching method used affected student learning performance. Identify the data
collection method used in this study.
　　A) data collected observationally
　　B) data from a designed experiment
　　C) data from a published source

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

57) What is meant by a representative sample?　　　　　　　　　　　　　　57) _____

58) What is the most common way to satisfy the representative sample requirement?　　58) _____

59) Three female students and two male students are to be chosen from a group of 30 female 59) _____
students and 20 male students. Does this sample of five students satisfy the conditions to
be a random sample of the 50 students in the group? Explain.

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

Answer the question True or False.
60) In an observational study, the researcher exerts strict control over the units in the study. 60) _____
　　A) True　　　　　　　　　　　　　　　B) False

8

61) When using data from a published source, it is not important to know how the data were collected   61) _____
and whether randomization was used.
    A) True   B) False

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Solve the problem.

62) In one study of the moral of company's employees, 10 employees were randomly chosen   62) _____
from each of the departments within the company. Identify the sampling design used.

63) In an attempt to determine the ages of its customers, one store asked every tenth customer   63) _____
who entered the store his or her age. Identify the sampling design used.

64) What term is used to describe the situation where sampling units contained in a sample do   64) _____
not produce sample observations?

65) What is meant by selection bias?   65) _____

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

66) Which type of problem has occurred when inaccuracies exist in the values of the data recorded?   66) _____
    A) nonresponse bias   B) selection bias   C) measurement error

67) A watchdog group is investigating how people are treated during the foreclosure process. Surveys   67) _____
were mailed to a random sample of 300 people who had recently been threatened with foreclosure.
75 of the surveys were returned by the postal service because the intended recipients had moved
and left no forwarding address. What type of problem has occurred?
    A) nonresponse bias   B) measurement error   C) selection bias

68) A university was interested in student reaction to a proposal to spend more on athletic scholarships   68) _____
and less on academic scholarships. 35 student athletes were surveyed. What type of problem has
occurred?
    A) nonresponse bias   B) selection bias   C) measurement error

69) The way in which an interviewer asks a question about political party affiliation causes   69) _____
respondents to answer that they have no affiliation when they actually do. What type of problem
has occurred?
    A) selection bias   B) nonresponse bias   C) measurement error

70) A student completing a research project for a criminal justice class obtained a radar gun for   70) _____
determining automobile speeds and recorded the speeds of automobiles passing a fixed location
over a period of several hours. The student was unaware that the device needed to be recharged
after two hours of use and that the speeds recorded after two hours were not reliable. What type of
problem has occurred?
    A) nonresponse bias   B) measurement error   C) selection bias

71) Because of the possible legal consequences, many people in a sample of the U.S. population chose   71) _____
not to participate in a survey regarding illegal drug use. What type of problem has occurred?
    A) nonresponse bias   B) measurement error   C) selection bias

72) A middle school was interested in surveying their students to find out opinions about the schools   72) _____
media center. To facilitate data collection, the homeroom period was extended 30 minutes to allow
everyone in the school ample time to respond to a short questionnaire. Unfortunately, it was
learned after the surveys had been completed that all honors students in the middle school were on
an all-day field trip and away from school for the entire day. The exclusion of their input into the
survey would be considered which type of sampling problem?
  A) measurement error   B) nonresponse bias   C) selection bias

73) A county planning commission is attempted to survey 1500 households from the counties 400,000   73) _____
households. A random sample was selected and surveys were mailed to the randomly selected
households, but only 1075 were returned. The inability to collect data from the 425 households that
didn't return the survey would be considered which type of sampling problem?
  A) selection bias   B) measurement error   C) nonresponse bias

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

74) Define statistical thinking.   74) _____

75) Give an example of unethical statistical practice.   75) _____

76) A health food company has the following statement on their new product packaging: 76) _____
"Prevents all types of cancer!" (Fact: Past studies have shown that some ingredients in the
new product have been know to possibly reduce the risk of many types of cancer). Discuss
why it is unethical to make this statement.

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

77) A researcher studying malnutrition among children in a developing country collected weights of a   77) _____
random sample of children using a scale that she had set to give weights 2.5 kilograms less than the
actual weight. Which statement best describes this situation?
  A) Measurement error has not occurred, and the researcher is not guilty of unethical statistical
    practice.
  B) Measurement error has occurred, but the researcher is not guilty of unethical statistical
    practice.
  C) Measurement error has occurred, and the researcher is guilty of unethical statistical practice.
  D) Measurement error has not occurred, but the researcher is guilty of unethical statistical
    practice.

1) D
2) Statistics is the science of data that involves collecting, classifying, summarizing, organizing, analyzing, and interpreting numerical information.
3) A
4) B
5) A
6) A
7) B
8) A
9) Descriptive: 14% of the students sampled (or 140) read at least one best-seller each month.

   Inferential: Based on the survey, we estimate that about 14% of all high school
                       students read at least one best-seller each month.
10) A
11) A
12) A
13) C
14) A
15) C
16) D
17) B
18) D
19) D
20) C
21) A
22) C
23) B
24) C
25) A
26) B
27) C
28) A
29) C
30) The population of interest are all students at the university who park. The sample is the parking times of the 110 students that were collected by the university administrator. The variable of interest to the administrators is the parking time variable.
31) The variable of interest to the researcher is the failure rate of the copiers.
32) The population of interest to the guidance counselor is all community colleges in the United States. The variable of interest is the annual tuition cost of the community college.
33) When a census is used, there should be no error.
34) B
35) A
36) A
37) A
38) B
39) A
40) A
41) A
42) B
43) A

44) B
45) A
46) A
47) D
48) Qualitative; The numbers are arbitrarily selected numerical codes for the categories and have no utility beyond that.
49) D
50) B
51) D
52) C
53) D
54) A
55) A
56) B
57) a sample that exhibits characteristics typical of those possessed by the population of interest
58) selecting a random sample
59) No; not every sample of 5 students from the group has an equal chance of selection; for example, a sample consisting of 5 males has no chance of being selected.
60) B
61) B
62) stratified random sampling
63) systematic sampling
64) nonresponse
65) Selection bias is when a subset of the experimental units in the population is excluded so that these units have no possibility of being selected in the sample.
66) C
67) A
68) B
69) C
70) B
71) A
72) C
73) C
74) Statistical thinking involves applying rational thought and the science of statistics to critically assess data and make inferences.
75) Researchers select a biased sample, with the intention of misleading the public.
76) Answers may vary. One possible answer is that the past studies show that the ingredients only have possible cancer reducing effects on many, not all, types of cancer.
77) C