

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

- 1) Is the following variable at the interval or the ratio level of measurement? 1) _____
The price of a loaf of bread
A) Interval B) Ratio
- 2) In an experiment, subjects are put into two categories according to sex, and then each subject is randomly assigned a treatment . This is an example of... 2) _____
A) observational studies B) gender bias
C) confounding D) randomized blocking
- 3) Determine which of the following describes qualitative data. 3) _____
i). the volume of a shipping container, in gallons
ii). the name of the material from which the container is made
iii). the shape of the container
A) i, ii, and iii B) i and iii only C) ii and iii only D) i and ii only
- 4) A college basketball team held a promotion at one of its games in which every twentieth person who entered the arena won a free basketball. What kind of sample do the winners represent? 4) _____
A) Systematic B) Voluntary response C) Stratified
- 5) Which one of the following data are discrete? 5) _____
A) the average preseason ranking of the University of Connecticut's women's basketball team over the past 10 years
B) the height of the tallest player on Duke University's men's basketball team
C) the pre-season ranking of Duke University's men's basketball team
D) the average height of players on the University of Connecticut's women's basketball team
- 6) In a _____ experiment, subjects do not decide for themselves which treatment they will get. 6) _____
A) double-blind B) observational C) randomized D) prospective
- 7) You ask your friends who they plan to vote for in the next congressional election. Based on their responses, you conclude that the candidate you favor cannot lose! 7) _____
This is most likely an example of ...
A) voluntary response bias B) self-interest bias
C) sampling bias D) randomized sampling

- 8) A study in which the assignment to treatment groups is not made by the investigator is called _____. 8) _____
A) double-blind B) prospective C) randomized D) observational
- 9) Determine which of the following describes qualitative data. 9) _____
i). the make of the car with license plate number VNS-862
ii). the license plate number VNS-862
iii). the number of vehicles whose license plate number begins with "VNS"
A) i and ii only B) iii only
C) neither i, nor ii, nor iii D) i only
- 10) Which one of the following data are discrete? 10) _____
A) the number of crew members on the boat
B) the latitude and longitude of a boat at sea
C) the speed of the boat's propeller, in revolutions per minute
D) the latitude and longitude of the boat's port of departure
- 11) Determine which of the following describes ordinal data. 11) _____
i. In the horse race, Betty's Girl won, Mr. Ed placed, and Wabash showed.
ii. In the horse race, I bet on Betty's Girl to win, Mr. Ed to place, and Wabash to show.
A) ii only B) neither i nor ii C) both i and ii D) i only
- 12) Determine which of the following describes quantitative data. 12) _____
i). the name of a chemical sample
ii). the mass of a chemical sample
iii). the color of a chemical sample
A) i and ii only B) i, ii, and iii C) i only D) ii only
- 13) A medical researcher wants to determine whether exercising can lower blood pressure. 13) _____
At a health fair, he measures the blood pressure of 100 individuals and interviews them about their exercise habits. He divides the individuals into two categories: those whose typical level of exercise is low, and those whose level of exercise is high. Is this a randomized experiment or an observational study?
A) Randomized experiment B) Observational study
- 14) Is the following variable at the interval or the ratio level of measurement? 14) _____
The weight in pounds of a sack of potatoes
A) Interval B) Ratio
- 15) Is the following variable at the interval or the ratio level of measurement? 15) _____
The year of your birth
A) Interval B) Ratio

- 23) Determine which of the following describes quantitative data. 23) _____
- i). the length of an object in feet
 - ii). the speed of an object in meters per second
 - iii). the number of objects that are blue
- A) i only B) iii only C) i and ii only D) i, ii, and iii

- 24) A radio talk show host invites listeners to send an email to express their opinions on an upcoming election. More than 10,000 emails are received. What kind of sample is this? 24) _____
- A) Stratified B) Voluntary response
 C) Systematic D) Cluster

- 25) Which of the following is the best description of a double-blind experiment? 25) _____
- A) an experiment in which neither the investigators nor the subjects know how the treatments have been assigned
 - B) an experiment in which both the investigators and the subjects are hidden from the others' views
 - C) an experiment in which the subjects are blindfolded so they cannot see which treatment is applied to them
 - D) an experiment in which neither the investigators nor the subjects know the others' names

- 26) A pollster asks a group of six voters about their political affiliation (Republican, Democrat, or Independent), their age, and whether they voted in the last election. The results are shown in the following table. 26) _____

Voter	Political Affiliation	Age	Voted in Last Election?
1	Republican	34	Yes
2	Democrat	56	Yes
3	Democrat	21	No
4	Independent	28	Yes
5	Republican	61	No
6	Independent	46	Yes

- What are the data for individual #3?
- A) Political affiliation, age, voted in last election
 - B) Democrat, 21
 - C) Political affiliation
 - D) Democrat, 21, no

- 27) When rolling two six-sided dice, your total roll ranges from 2 (double ones) to 12 (double sixes). Characterize the nature of the roll total. 27) _____
- A) qualitative and discrete B) qualitative and continuous
 - C) quantitative and continuous D) quantitative and discrete

- 28) To study the effect of air pollution on respiratory health, a group of people in a city with high levels of air pollution and another group in a rural area with low levels of pollution are examined to determine their lung capacity. Is this a randomized experiment or an observational study? 28) _____
 A) randomized experiment B) observational study
- 29) An electronics manufacturer test every 50th cell phone to verify that it is functioning properly. Identify the kind of sample that is being used. 29) _____
 A) cluster sample B) stratified sample
 C) systematic sample D) simple random sample
- 30) Is the following variable at the interval or the ratio level of measurement? 30) _____
 The year you started school
 A) Interval B) Ratio
- 31) In a randomized experiment, if there are large differences in outcomes among the treatment groups, we can conclude that the differences are due to _____ 31) _____
 A) the treatments B) random luck
 C) deliberate data manipulation D) experimental error
- 32) A medical researcher wants to determine whether exercising can lower blood pressure. She recruits 100 people with high blood pressure to participate in the study. She assigns a random sample of 50 of them to pursue an exercise program that includes daily swimming and jogging. She assigns the other 50 to refrain from vigorous activity. She measures the blood pressure of each of the 100 individuals both before and after the study. Is this a randomized experiment or an observational study? 32) _____
 A) Randomized experiment B) Observational study
- 33) In a study conducted at the University of Colorado, J. Rutenber and colleagues studied people who had worked at the Rocky Flats nuclear weapons production facility near Denver, Colorado. They studied a group of workers who had contracted lung cancer and another group who had not contracted lung cancer. They looked back at plant records to determine the amount of radiation exposure for each worker. The purpose of the study was to determine whether the people with lung cancer had been exposed to higher levels of radiation than those who had not gotten lung cancer. Was this a cohort study or a case-control study? 33) _____
 A) Cohort study B) Case-control study
- 34) Is the following variable at the interval or the ratio level of measurement? 34) _____
 Your age in years
 A) Interval B) Ratio

- 35) A _____ is a variable related to both the treatment and the outcome. 35) _____
 A) dependent B) perplexer C) cohort D) confounder
- 36) Which one of the following data are continuous? 36) _____
 A) all of these represent continuous data
 B) the number of musicians performing in the MP3 file
 C) the number of times the file has been downloaded
 D) the time remaining for an MP3 music download
- 37) In a recent study, Z. Zhao and colleagues measured the levels of formaldehyde in the air 37) _____
 in 34 classrooms in the schools in the city of Taiyuan, China. On the same day, they gave
 questionnaires to 1993 students aged 11–15 in those schools, asking them whether they
 had experienced respiratory problems (such as asthma attacks, wheezing, or shortness of
 breath). They found that the students in the classrooms with higher levels of
 formaldehyde reported more respiratory problems. Was the study prospective,
 cross-sectional, or
 retrospective?
 A) Cross-sectional B) Prospective C) Retrospective
- 38) Which one of the following data are continuous? 38) _____
 A) the number of representatives of each species in the park
 B) the rankings of the trees, from most numerous to least numerous
 C) the average height of a sample of trees
 D) the number of species of trees in a park
- 39) Which of the following is the best description of a randomized experiment? 39) _____
 A) an experiment in which the investigators are chosen at random

 B) an experiment in which the outcomes are random
 C) an experiment in which the treatments are assigned randomly to experimental units
 D) an experiment in which the experimental units are selected at random
- 40) In a study conducted at the University of Colorado, J. Rutenber and colleagues studied 40) _____
 people who had worked at the Rocky Flats nuclear weapons production facility near
 Denver, Colorado. They studied a group of workers who had contracted lung cancer and
 another group who had not contracted lung cancer. They looked back at plant records to
 determine the amount of radiation exposure for each worker. The purpose of the study
 was to determine whether the people with lung cancer had been exposed to higher levels
 of radiation than those who had not gotten lung cancer. Was the study prospective,
 cross-sectional, or retrospective?
 A) Retrospective B) Prospective C) Cross-sectional

- 46) In a study conducted at the University of Southern California, J. Peters and colleagues studied elementary school students in 12 California communities. Each year for 10 years, they measured the respiratory function of the children and the levels of air pollution in the communities. Was this a cohort study or a case-control study? 46) _____
 A) Cohort study B) Case-control study
- 47) By visiting homes door-to-door, a municipality surveys all the households in 149 randomly-selected neighborhoods to see how residents feel about a proposed property tax increase. Identify the type of sample that is being used. 47) _____
 A) systematic sample B) cluster sample
 C) voluntary response sample D) stratified sample
- 48) Choose the answer below that best completes the following statement. 48) _____
 A) _____ is a number that describes a population.
 A) summary B) statistic C) parameter D) sample
- 49) Determine which of the following describes nominal data. 49) _____
 i. My favorite days of the week are Friday, Saturday, and Tuesday.
 ii. My favorite day of the week is Friday, my second-favorite is Saturday, and third-favorite is Tuesday.
 A) both i and ii B) neither i nor ii C) ii only D) i only
- 50) A recent study compared the heart rates of 19 infants born to nonsmoking mothers with those of 17 infants born to mothers who smoked an average of 15 cigarettes a day while pregnant and after giving birth. The heart rates of the infants at one year of age were 20% slower on the average for the smoking mothers. Was the study prospective, cross-sectional, or retrospective? 50) _____
 A) Retrospective B) Cross-sectional C) Prospective
- 51) In a study conducted at the University of Southern California, J. Peters and colleagues studied elementary school students in 12 California communities. Each year for 10 years, they measured the respiratory function of the children and the levels of air pollution in the communities. Was the study prospective, cross-sectional, or retrospective? 51) _____
 A) Retrospective B) Cross-sectional C) Prospective
- 52) A television newscaster invites viewers to tweet their opinions on a proposed bill on immigration policy. More than 50,000 people express their opinions in this way. 52) _____
 A) Systematic B) Voluntary response
 C) Stratified D) Cluster

- 53) A telephone company wants to estimate the proportion of customers who are satisfied with their service. They use a computer to generate a list of random phone numbers and call those people to ask them whether they are satisfied. Is this a simple random sample? 53) _____
 A) yes B) no
- 54) Is the following variable at the interval or the ratio level of measurement? 54) _____
 The time that your first class starts
 A) Interval B) Ratio
- 55) The names of all 126 students in a professor's class are written on identical slips of paper, and the slips are placed into a large glass jar. Then, the professor selects 14 random slips from the jar. Identify the kind of sample that is being used. 55) _____
 A) simple random sample B) sample of convenience
 C) cluster sample D) systematic sample
- 56) Is the following variable at the interval or the ratio level of measurement? 56) _____
 The score on an SAT exam (range is 200 to 800 points)
 A) Interval B) Ratio
- 57) In a recent study, Z. Zhao and colleagues measured the levels of formaldehyde in the air in 34 classrooms in the schools in the city of Taiyuan, China. On the same day, they gave questionnaires to 1993 students aged 11–15 in those schools, asking them whether they had experienced respiratory problems (such as asthma attacks, wheezing, or shortness of breath). They found that the students in the classrooms with higher levels of formaldehyde reported more respiratory problems. Was this a cohort study or a case-control study? 57) _____
 A) Cohort study B) Case-control study
- 58) The question... 58) _____
 "Do you favor a higher standard of living, even though it produces unclean air and water?"
 ... is an example of ...
 A) framing B) leading question bias
 C) sampling bias D) random sampling
- 59) Which of the following sample types should you always regard as unreliable? 59) _____
 A) voluntary response samples B) stratified samples
 C) cluster samples D) simple random samples
- 60) An app produces a message requesting customers to click on a link to rate the app. 60) _____
 A) Voluntary response B) Cluster C) Systematic

- 61) In a small town, 84% of the residents, aged 16 or more years old, own a car. Is this an example of statistic or a parameter? 61) _____
 A) Statistic B) Parameter
- 62) A radio talk show invites people to call in and state whether or not they think that sexual harassment in the work place is a common problem. 62) _____
 A) Voluntary response B) Self-interest
 C) Sampling D) Social acceptability
- 63) In a recent poll, 64% of the respondents supported stricter gun laws. Is this an example of statistic or a parameter? 63) _____
 A) Statistic B) Parameter
- 64) When experimental units are people, they are sometimes called _____. 64) _____
 A) personnel B) human units C) subjects D) topics
- 65) A small brew pub sent out questionnaires to a simple random sample of 250 customers asking whether they would like the brewery to include an imperial stout in their regular offerings. Of the 250 questionnaires, 12 were returned and 10 of those were in favor of including the stout. Specify the type of bias involved. 65) _____
 A) Sampling B) Nonresponse
 C) Voluntary response D) Self-interest
- 66) A(n) _____ makes it difficult to determine whether an experimental outcome is due to the applied treatment. 66) _____
 A) confounder B) perplexer
 C) uncooperative subject D) error
- 67) Of the televisions offered at an electronics store, 42% cost less than \$500.00. Is this an example of statistic or a parameter? 67) _____
 A) Statistic B) Parameter
- 68) The characteristics of individuals about which we collect information are called _____. 68) _____
 A) clusters B) variables C) samples D) data
- 69) A _____ is a type of sample that is analogous to a lottery. 69) _____
 A) sample of convenience B) population
 C) simple random sample D) cluster

70) A pollster asks a group of six voters about their political affiliation (Republican, Democrat, or Independent), their age, and whether they voted in the last election. The results are shown in the following table.

70) _____

Voter	Political Affiliation	Age	Voted in Last Election?
1	Republican	34	Yes
2	Democrat	56	Yes
3	Democrat	21	No
4	Independent	28	Yes
5	Republican	61	No
6	Independent	46	Yes

How many individuals are there?

- A) 74 B) 6 C) 21 D) 246

71) In a survey of 1000 teenagers, 23% of them said they use tobacco products. Is this an example of statistic or a parameter?

71) _____

- A) Statistic B) Parameter

72) The values of variables are called _____.

72) _____

- A) data B) variables C) clusters D) samples

73) An experiment that tends to overestimate or underestimate the true value is said to be _____.

73) _____

- A) biased B) randomized
C) un-randomized D) flagrant

74) A sign in a grocery store claims that 92% of their customers believe them to have the freshest produce in the city. Specify the type of bias involved.

74) _____

- A) Voluntary response B) Social acceptability
C) Self-interest D) Leading question

75) In an experiment, the _____ is what is measured on each experimental unit.

75) _____

- A) subject B) treatment C) outcome D) category

76) A _____ is a subset of a population.

76) _____

- A) sample B) sample of convenience
C) cluster D) simple random sample

77) The entire collection of individuals about which information is sought is called a _____.

77) _____

- A) population B) simple random sample
C) cluster D) sample

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

- 78) Determine whether the statement is true or false. 78) _____
In a cross-sectional study, measurements are made at only one point in time.
- 79) Determine whether the statement is true or false. 79) _____
A sample of convenience is never acceptable.
- 80) Determine whether the statement is true or false. 80) _____
In a case-control study, the outcome has occurred before the subjects are sampled.
- 81) Determine whether the statement is true or false. 81) _____
Observational studies are generally more reliable than randomized experiments.

Answer Key
Testname: C1

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

Answer Key

Testname: C1

- 51) A
- 52) B
- 53) A
- 54) A
- 55) A
- 56) A
- 57) A
- 58) B
- 59) A
- 60) A
- 61) B
- 62) A
- 63) A
- 64) C
- 65) B
- 66) A
- 67) B
- 68) B
- 69) C
- 70) B
- 71) A
- 72) A
- 73) A
- 74) C
- 75) C
- 76) A
- 77) A
- 78) TRUE
- 79) FALSE
- 80) TRUE
- 81) FALSE