

Exam

Name _____

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

Provide an appropriate response.

- 1) Classify the following random variable: telephone area codes 1) _____
A) quantitative discrete data B) experimental data
C) quantitative continuous data D) qualitative data

Answer: D

- 2) A drug company wanted to test a new arthritis medication. The researchers found 800 adults aged 25-35 and randomly assigned them to two groups. The first group received the new drug, while the second received a placebo. After one month of treatment, the percentage of each group whose arthritis symptoms decreased was recorded and compared. What is the treatment in this experiment? 2) _____
A) the 800 adults aged 25-35
B) the drug
C) the percentage who had decreased arthritis symptoms
D) the one month treatment time

Answer: B

Identify the type of sampling used.

- 3) Thirty-five math majors, 38 music majors and 47 history majors are randomly selected from 206 math majors, 535 music majors and 471 history majors at the state university. What sampling technique is used? 3) _____
A) systematic
B) simple random
C) cluster
D) stratified
E) convenience

Answer: D

Provide an appropriate response.

- 4) The object upon which the response variable is measured is called _____. 4) _____
A) the factor B) a treatment
C) the predictor variable D) an experimental unit

Answer: D

- 5) The peak shopping time at a pet store is between 8-11:00 am on Saturday mornings. Management at the pet store randomly selected 155 customers last Saturday morning and decided to observe their shopping habits. They recorded the number of items that a sample of the customers purchased as well as the total time the customers spent in the store. Identify the types of variables recorded by the pet store. 5) _____
A) number of items - continuous; total time - discrete
B) number of items - discrete; total time - continuous
C) number of items - continuous; total time - continuous
D) number of items - discrete; total time - discrete

Answer: B

Determine whether the quantitative variable is discrete or continuous.

- 6) the number of bottles of juice sold in a cafeteria during lunch 6) _____
A) continuous B) discrete

Answer: B

Determine whether the underlined value is a parameter or a statistic.

- 7) 51.4% of the residents of Idlington Garden City are female. 7) _____
A) statistic B) parameter

Answer: B

Provide an appropriate response.

- 8) The number of violent crimes committed in a city on a given day in a random sample of 80 days is a 8) _____
_____ random variable.
A) continuous B) discrete

Answer: B

Determine whether the underlined value is a parameter or a statistic.

- 9) Telephone interviews of 336 employees of a large electronics company found that 75% were 9) _____
dissatisfied with their working conditions.
A) statistic B) parameter

Answer: A

Determine whether the study depicts an observational study or an experiment.

- 10) A pollster obtains a sample of students and asks them how they will vote on an upcoming 10) _____
referendum.
A) observational study B) experiment

Answer: A

Provide an appropriate response.

- 11) Parking at a large university has become a very big problem. University administrators are 11) _____
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 290 students and carefully
recorded their parking times. Identify the population of interest to the university administration.
A) the entire set of faculty, staff, and students that park at the university
B) the parking times of the entire set of students that park at the university
C) the parking times of the 290 students from whom the data were collected
D) the students that park at the university between 9 and 10 AM on Wednesdays

Answer: B

- 12) The legal profession conducted a study to determine the percentage of cardiologists who had been 12) _____
sued for malpractice in the last ten years. The sample was randomly chosen from a national
directory of doctors. Identify the individuals in the study.
A) the responses: have been sued/have not been sued for malpractice in the last ten years
B) all cardiologists in the directory
C) each cardiologist selected from the directory
D) the doctor's area of expertise (i.e., cardiology, pediatrics, etc.)

Answer: C

Determine what type of observational study is described. Explain.

- 13) Researchers wanted to determine whether there was an association between high blood pressure and the suppression of emotions. The researchers looked at 1800 adults enrolled in a Health Initiative Observational Study. Each person was interviewed and asked about their response to emotions. In particular they were asked whether their tendency was to express or to hold in anger and other emotions. The degree of suppression of emotions was rated on a scale of 1 to 10. Each person's blood pressure was also measured. The researchers analyzed the results to determine whether there was an association between high blood pressure and the suppression of emotions. 13) _____
- A) cross-sectional; Information is collected at a specific point in time.
 - B) retrospective; Individuals are asked to look back in time.
 - C) cohort; Individuals are observed over a long period of time.

Answer: A

Determine the level of measurement of the variable.

- 14) time spent playing basketball 14) _____
- A) interval
 - B) ordinal
 - C) ratio
 - D) nominal

Answer: C

Provide an appropriate response.

- 15) A student is asked to rate a guest speaker's ability to communicate on a scale of poor-average-good-excellent. The student is to fill in a corresponding circle on a bubble form. This is an example of collecting what type of data? 15) _____
- A) qualitative
 - B) insightful
 - C) discrete
 - D) continuous

Answer: A

- 16) True or False: Experiments assist the researcher in isolating the causes of the relationships that exist between two variables. 16) _____
- A) True
 - B) False

Answer: A

Determine whether the underlined value is a parameter or a statistic.

- 17) A study of 1700 college students in the city of Pembrington found that 11% had been victims of violent crimes. 17) _____
- A) statistic
 - B) parameter

Answer: A

Provide an appropriate response.

- 18) Which of the following is not true about factors? 18) _____
- A) Factors whose effect on the response variable is not of interest can be set after the experiment.
 - B) Any combination of the values of the factors is called a treatment.
 - C) One way to control factors is to fix their level at one predetermined value throughout the experiment.
 - D) Factors whose effect on the response variable interests us should be set at predetermined levels.

Answer: A

- 19) An experiment in which the experimental unit (or subject) does not know which treatment he or she is receiving is called a _____. 19) _____
- A) single-blind experiment
 - B) randomized block design
 - C) double-blind experiment
 - D) matched-pairs design

Answer: A

Classify the variable as qualitative or quantitative.

- 20) the weights of cases loaded onto an airport conveyor belt 20) _____
A) quantitative B) qualitative

Answer: A

Determine whether the quantitative variable is discrete or continuous.

- 21) the low temperature in degrees Fahrenheit on January 1st in Cheyenne, Wyoming 21) _____
A) continuous B) discrete

Answer: A

Classify the variable as qualitative or quantitative.

- 22) the temperatures of cups of coffee served at a restaurant 22) _____
A) qualitative B) quantitative

Answer: B

Provide an appropriate response.

- 23) A drug company wanted to test a new depression medication. The researchers found 700 adults aged 25-35 and randomly assigned them to two groups. The first group received the new drug, while the second received a placebo. After one month of treatment, the percentage of each group whose depression symptoms decreased was recorded and compared. How many levels does the treatment in this experiment have? 23) _____
A) 1 (months of treatment) B) 2 (medication or placebo)
C) 700 (number of respondents) D) 10 (age span of respondents)

Answer: B

Identify the type of sampling used.

- 24) At a local technical school, five auto repair classes are randomly selected and all of the students from each class are interviewed. What sampling technique is used? 24) _____
A) cluster
B) convenience
C) systematic
D) simple random
E) stratified

Answer: A

Determine whether the study depicts an observational study or an experiment.

- 25) A scientist was studying the effects of a new fertilizer on crop yield. She randomly assigned half of the plots on a farm to group one and the remaining plots to group two. On the plots in group one, the new fertilizer was used for a year. On the plots in group two, the old fertilizer was used. At the end of the year the average crop yield for the plots in group one was compared with the average crop yield for the plots in group two. 25) _____
A) observational study B) experiment

Answer: B

Provide an appropriate response.

- 26) A drug company wanted to test a new depression medication. The researchers found 700 adults aged 25-35 and randomly assigned them to two groups. The first group received the new drug, while the second received a placebo. After one month of treatment, the percentage of each group whose depression symptoms decreased was recorded and compared. Identify the experimental units. 26) _____
- A) the one month treatment time
 - B) the percentage who had decreased depression symptoms
 - C) the 700 adults aged 25-35
 - D) the drug (medication or placebo)

Answer: C

Determine what type of observational study is described. Explain.

- 27) A researcher wanted to determine whether women with children are more likely to develop anxiety disorders than women without children. She selected a sample of 900 twenty-year old women and followed them for a twenty-year period. At the start of the study, none of the women had children. By the end of the study 53% of the women had at least one child. The level of anxiety of each participant was evaluated at the beginning and at the end of the study and the increase (or decrease) in anxiety was recorded. The researchers analyzed the results to determine whether there was an association between anxiety and having children. 27) _____
- A) cross-sectional; Information is collected at a specific point in time.
 - B) retrospective; Individuals are asked to look back in time.
 - C) cohort; Individuals are observed over a long period of time.

Answer: C

Provide an appropriate response.

- 28) The government of a town needs to determine if the city's residents will support the construction of a new town hall. The government decides to conduct a survey of a sample of the city's residents. Which one of the following procedures would be most appropriate for obtaining a sample of the town's residents? 28) _____
- A) Survey a random sample of persons within each geographic region of the city.
 - B) Survey the first 200 people listed in the town's telephone directory.
 - C) Survey a random sample of employees at the old city hall.
 - D) Survey every 4th person who walks into city hall on a given day.

Answer: A

Determine the level of measurement of the variable.

- 29) the native language of a tourist 29) _____
- A) nominal
 - B) ordinal
 - C) ratio
 - D) interval

Answer: A

Classify the variable as qualitative or quantitative.

- 30) the number of calls received at a company's help desk 30) _____
- A) quantitative
 - B) qualitative

Answer: A

Determine whether the quantitative variable is discrete or continuous.

- 31) the weight of a player on the wrestling team 31) _____
- A) continuous
 - B) discrete

Answer: A

- 32) the speed of a car on a Boston tollway during rush hour traffic 32) _____
A) continuous B) discrete
Answer: A

Classify the variable as qualitative or quantitative.

- 33) the numbers on the shirts of a boy's football team 33) _____
A) quantitative B) qualitative
Answer: B

Provide an appropriate response.

- 34) A medical journal published the results of an experiment on depression. The experiment investigated the effects of a controversial new therapy for depression. Researchers measured the depression levels of 47 adult women who suffer moderate conditions of the disorder. After the therapy, the researchers again measured the women's depression levels. The differences between the the pre- and post-therapy depression levels were reported. What is the treatment in this experiment? 34) _____
A) the 47 adult women who suffer from depression
B) the disorder (depression or no depression)
C) the therapy
D) the differences between the the pre- and post-therapy depression levels
Answer: C

- 35) A medical journal published the results of an experiment on insomnia. The experiment investigated the effects of a controversial new therapy for insomnia. Researchers measured the insomnia levels of 78 adult women who suffer moderate conditions of the disorder. After the therapy, the researchers again measured the women's insomnia levels. The differences between the the pre- and post-therapy insomnia levels were reported. Identify the experimental units. 35) _____
A) the disorder (insomnia or no insomnia)
B) the therapy time period (pre or post)
C) the 78 adult women who suffer from insomnia
D) the differences between the pre- and post-therapy insomnia levels
Answer: C

- 36) The variable measured in the experiment is called _____. 36) _____
A) a sampling unit B) the response variable
C) the treatment D) the predictor variable
Answer: B

Determine the level of measurement of the variable.

- 37) the musical instrument played by a music student 37) _____
A) ordinal B) ratio C) nominal D) interval
Answer: C

- 38) the year of manufacture of a car 38) _____
A) nominal B) ratio C) interval D) ordinal
Answer: C

Determine what type of observational study is described. Explain.

- 39) A researcher wanted to determine whether colon cancer was associated with eating meat. He selected a sample of 500 men with colon cancer and an equal number of men without colon cancer. The two groups were matched - in other words they were similar in terms of age, occupation, income, and exercise levels. Histories on the amount of meat consumed over the previous twenty years were obtained for all men. The total amount of meat that each man eaten in the previous twenty years was estimated. The meat consumption was compared for the two groups. 39) _____
- A) cohort; Individuals are observed over a long period of time.
B) cross-sectional; Information is collected at a specific point in time.
C) retrospective; Individuals are asked to look back in time

Answer: C

Solve the problem.

- 40) A bicycle manufacturer produces four different bicycle models. Information is summarized in the table below: 40) _____

Model	Series Number	Weight	Style
Ascension	A120	32	Mountain
Road Runner	B640	21	Road
All Terrain	C300	26	Hybrid
Class Above	D90	15	Racing

Identify the variables and determine whether each variable is quantitative or qualitative.

- A) series number: quantitative; weight: qualitative; style: qualitative
B) series number: qualitative; weight: quantitative; style: qualitative
C) series number: quantitative; weight: quantitative; style: qualitative
D) series number: qualitative; weight: qualitative; style: qualitative

Answer: B

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

Provide an appropriate response.

- 41) A survey of 1027 American households found that 37% of the households own a DVD recorder. Identify the population, the sample, and the individuals in the study. 41) _____

Answer: population: collection of all American households; sample: collection of 1027 American households surveyed; individuals: each household

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

Classify the variable as qualitative or quantitative.

- 42) the bank account numbers of the students in a class 42) _____
A) quantitative B) qualitative

Answer: B

Identify the type of sampling used.

- 43) A market researcher randomly selects 500 homeowners under 70 years of age and 300 homeowners over 70 years of age. What sampling technique was used? 43) _____
- A) convenience
 - B) simple random
 - C) stratified
 - D) systematic
 - E) cluster

Answer: C

Provide an appropriate response.

- 44) A salesman boasts to a farmer that his new fertilizer will increase the yield of the farmer's crops by 15%. The farmer wishes to test the effects of the new fertilizer on her corn yield. She has four equal sized plots of land—one with sandy soil, one with rocky soil, one with clay-rich soil, and one with average soil. She divides each of the four plots into three equal sized portions and randomly labels them A, B and C. The four A portions are treated with her old fertilizer. The four B portions are treated with the new fertilizer. The four C portions receive no fertilizer. At harvest time, the corn yield is recorded for each section of land. What is the claim she is testing? 44) _____
- A) The total yield increased at least 15%.
 - B) The A sections had at least a 15% increase in yield.
 - C) The average soil field had at least a 15% increase in yield.
 - D) The new fertilizer yielded at least a 15% improvement.

Answer: D

- 45) A manufacturer of cellular phones has decided that an assembly line is operating satisfactorily if less than 0.05% of the phones produced per day are defective. To check the quality of a day's production, the company decides to randomly sample 30 phones from a day's production to test for defects. Define the population of interest to the manufacturer. 45) _____
- A) the 30 phones sampled and tested
 - B) the 30 responses: defective or not defective
 - C) all the phones produced during the day in question
 - D) the 0.05% of the phones that are defective

Answer: C

- 46) 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 280 students and carefully recorded their parking times. Identify the sample of interest to the university administration. 46) _____
- A) location of the parking spot
 - B) parking times of the 280 students
 - C) type of car (import or domestic)
 - D) parking time of a student

Answer: B

Determine the level of measurement of the variable.

- 47) the medal received (gold, silver, bronze) by an Olympic gymnast 47) _____
- A) ratio
 - B) interval
 - C) nominal
 - D) ordinal

Answer: D

Determine whether the underlined value is a parameter or a statistic.

- 48) The average age of the 65 students in Ms. Hope's political science class is 21 years 10 months. 48) _____
- A) parameter
 - B) statistic

Answer: A

Identify the type of sampling used.

- 49) A travel industry researcher interviews all of the passengers on five randomly selected cruises. 49) _____
What sampling technique is used?
A) convenience
B) cluster
C) simple random
D) systematic
E) stratified

Answer: B

Determine what type of observational study is described. Explain.

- 50) Vitamin D is important for the metabolism of calcium and exposure to sunshine is an important source of vitamin D. A researcher wanted to determine whether osteoporosis was associated with a lack of exposure to sunshine. He selected a sample of 250 women with osteoporosis and an equal number of women without osteoporosis. The two groups were matched - in other words they were similar in terms of age, diet, occupation, and exercise levels. Histories on exposure to sunshine over the previous twenty years were obtained for all women. The total number of hours that each woman had been exposed to sunshine in the previous twenty years was estimated. The amount of exposure to sunshine was compared for the two groups. 50) _____
A) cohort; Individuals are observed over a long period of time.
B) retrospective; Individuals are asked to look back in time
C) cross-sectional; Information is collected at a specific point in time.

Answer: B

Determine whether the quantitative variable is discrete or continuous.

- 51) the number of goals scored in a hockey game 51) _____
A) continuous B) discrete

Answer: B

Determine what type of observational study is described. Explain.

- 52) Researchers wanted to determine whether there was an association between city driving and stomach ulcers. They selected a sample of 900 young adults and followed them for a twenty-year period. At the start of the study none of the participants was suffering from a stomach ulcer. Each person kept track of the number of hours per week they spent driving in city traffic. At the end of the study each participant underwent tests to determine whether they were suffering from a stomach ulcer. The researchers analyzed the results to determine whether there was an association between city driving and stomach ulcers. 52) _____
A) cross-sectional; Information is collected at a specific point in time.
B) cohort; Individuals are observed over a long period of time.
C) retrospective; Individuals are asked to look back in time.

Answer: B

Provide an appropriate response.

- 53) A medical journal published the results of an experiment on depression. The experiment investigated the effects of a controversial new therapy for depression. Researchers measured the depression levels of 69 adult women who suffer moderate conditions of the disorder. After the therapy, the researchers again measured the women's depression levels. The differences between the pre- and post-therapy depression levels were reported. How many levels does the treatment have in this experiment? 53) _____
- A) 1 (therapy)
 - B) 138 (the adult women who suffer from depression measured pre- and post-therapy)
 - C) 69 (the adult women who suffer from depression)
 - D) 2 (pre- and post-therapy)

Answer: D

Classify the variable as qualitative or quantitative.

- 54) the native languages of students in an English class 54) _____
- A) quantitative
 - B) qualitative

Answer: B

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

Provide an appropriate response.

- 55) A local hardware store wants to know if its customers are satisfied with the customer service they receive. The store posts an interviewer at the front of the store to ask the first 60 shoppers who leave the store, "How satisfied, on a scale of 1 to 10, were you with this store's customer service?" Determine the type of bias. 55) _____

Answer: Sampling bias; the customers are not chosen through a random sample.

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

- 56) Multiple choice questions on a test that include as one of the choices "none of the above" are an example of what type of question? 56) _____
- A) reader response question
 - B) framing question
 - C) open question
 - D) closed question

Answer: D

Classify the variable as qualitative or quantitative.

- 57) the number of seats in a school auditorium 57) _____
- A) qualitative
 - B) quantitative

Answer: B

Determine whether the study depicts an observational study or an experiment.

- 58) A researcher obtained a random sample of 100 smokers and a random sample of 100 nonsmokers. After interviewing all 200 participants in the study, the researcher compared the rate of depression among the smokers with the rate of depression among nonsmokers. 58) _____
- A) experiment
 - B) observational study

Answer: B

Identify the type of sampling used.

- 59) A statistics student interviews everyone in his apartment building to determine who owns a cell phone. What sampling technique is used? 59) _____
- A) systematic
 - B) simple random
 - C) cluster
 - D) convenience
 - E) stratified

Answer: D

Provide an appropriate response.

- 60) Quantitative variables classify individuals in a sample according to 60) _____
- A) numerical measure.
 - B) personality characteristic.
 - C) exhibited trait.
 - D) physical attribute.

Answer: A

- 61) A researcher wants to study the effects of advertising by female models upon high school boys in small Midwestern towns. The research methodology calls for selecting several small Midwestern towns that have high schools. What is the frame for this study? 61) _____
- A) all students attending high school from small Midwestern towns
 - B) high school boys from the small Midwestern towns selected
 - C) high school students from the small Midwestern towns selected
 - D) all high school boys from small Midwestern towns

Answer: D

Determine whether the study depicts an observational study or an experiment.

- 62) A poll is conducted in which professional musicians are asked their ages. 62) _____
- A) experiment
 - B) observational study

Answer: B

Determine whether the quantitative variable is discrete or continuous.

- 63) the number of pills in an aspirin bottle 63) _____
- A) discrete
 - B) continuous

Answer: A

Provide an appropriate response.

- 64) _____ is a condition applied to the experimental units involved in an experiment. 64) _____
- A) A treatment
 - B) The design
 - C) The sampling design
 - D) The factor level

Answer: A

65) Select a random sample of five state capitals from the list below using the two digit list of random numbers provided. Begin with the uppermost left random number and proceed down each column. When a column is complete, use the numbers at the top of the next right column and proceed down that column.

65) _____

State Capitals

1	Albany, NY	11	Charleston, WV	21	Hartford, CT	31	Madison, WI	41	Richmond, VA
2	Annapolis, MD	12	Cheyenne, WY	22	Helena, MT	32	Montgomery, AL	42	Sacramento, CA
3	Atlanta, GA	13	Columbia, SC	23	Honolulu, HI	33	Montpelier, VT	43	Salem, OR
4	Augusta, ME	14	Columbus, OH	24	Indianapolis, IN	34	Nashville, TN	44	Salt Lake City, UT
5	Austin, TX	15	Concord, NH	25	Jackson, MS	35	Oklahoma City, OK	45	Santa Fe, NM
6	Baton Rouge, LA	16	Denver, CO	26	Jefferson City, MO	36	Olympia, WA	46	Springfield, IL
7	Bismarck, ND	17	Des Moines, IA	27	Juneau, AK	37	Phoenix, AZ	47	St. Paul, MN
8	Boise, ID	18	Dover, DE	28	Lansing, MI	38	Pierre, SD	48	Tallahassee, FL
9	Boston, MA	19	Frankfort, KY	29	Lincoln, NE	39	Providence, RI	49	Topeka KS
10	Carson City, NV	20	Harrisburg, PA	30	Little Rock, AR	40	Raleigh, NC	50	Trenton, NJ

Random Numbers

46	81	17	60	92	59	40	9
53	78	45	14	53	78	8	43
3	99	46	86	41	42	36	95
39	14	16	59	84	18	5	48
45	41	77	91	11	43	76	28

- A) Springfield, IL; Des Moines, IA; Boston, MA; Santa Fe, NM; Columbus OH.
- B) Springfield, IL; Atlanta, GA; Providence, RI; Santa Fe, NM; Columbus OH.
- C) Boston, MA; Concord, NH; Dover DE; Santa Fe, NM; Richmond, VA.
- D) Carson City NV; Boise ID; Atlanta, GA; Cheyenne, WY; Boston, MA.

Answer: B

66) A recent 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. Forty-five hundred Florida residents were surveyed. Which of the following is the population used in the study?

66) _____

- A) all Florida residents who lived along the beaches
- B) the 4500 Florida residents surveyed
- C) all Florida residents
- D) the Florida residents who were willing to spend more tax dollars on protecting the beaches from environmental disasters

Answer: C

- 67) A drug company wanted to test a new depression medication. The researchers found 300 adults aged 25-35 and randomly assigned them to two groups. The first group received the new drug, while the second received a placebo. After one month of treatment, the percentage of each group whose depression symptoms decreased was recorded and compared. What type of experimental design is this? 67) _____
- A) matched-pairs design
 - B) randomized block design
 - C) completely randomized design
 - D) single-blind design

Answer: C

Identify the type of sampling used.

- 68) Based on 11,000 responses from 37,500 questionnaires sent to all its members, a major medical association estimated that the annual salary of its members was \$92,000 per year. What sampling technique was used? 68) _____
- A) stratified
 - B) systematic
 - C) convenience
 - D) cluster
 - E) simple random

Answer: E

Determine the level of measurement of the variable.

- 69) weight of rice bought by a customer 69) _____
- A) ratio
 - B) interval
 - C) ordinal
 - D) nominal

Answer: A

Provide an appropriate response.

- 70) A medical journal published the results of an experiment on insomnia. The experiment investigated the effects of a controversial new therapy for insomnia. Researchers measured the insomnia levels of 32 adult women who suffer moderate conditions of the disorder. After the therapy, the researchers again measured the women's insomnia levels. The differences between the pre- and post-therapy insomnia levels were reported. What is the response variable in this experiment? 70) _____
- A) the differences between the pre- and post-therapy insomnia levels
 - B) the therapy
 - C) the 32 adult women who suffer from insomnia
 - D) the disorder (insomnia or no insomnia)

Answer: A

Determine whether the quantitative variable is discrete or continuous.

- 71) the number of phone calls to the police department on any given day 71) _____
- A) discrete
 - B) continuous

Answer: A

Provide an appropriate response.

- 72) Which of the following is not true of statistics? 72) _____
- A) Statistics is used to draw conclusions using data.
 - B) Statistics involves collecting and summarizing data.
 - C) Statistics is used to answer questions with 100% certainty.
 - D) Statistics can be used to organize and analyze information.

Answer: C

- 73) True or False: Observational studies are not as useful as experiments to learn about the characteristics of a population. 73) _____
A) False B) True
Answer: A

Determine the level of measurement of the variable.

- 74) height of a tree 74) _____
A) ordinal B) ratio C) nominal D) interval
Answer: B
- 75) ranking (first place, second place, etc.) of contestants in a singing competition 75) _____
A) nominal B) ordinal C) ratio D) interval
Answer: B

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

Provide an appropriate response.

- 76) Administrators at a large university want to know the average debt incurred by their graduates. Surveys were mailed to 270 graduating seniors asking them to report their total student loan debt. Identify the population, sample, and individuals in the study. 76) _____
Answer: The population of interest is the student loan debt incurred by all graduates of the university. The sample is student loan debt of the 270 graduating seniors that were collected by the university administrators. The individuals are each graduating senior whose student loan debt was recorded.

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

- 77) The policy committee at State University has 6 members: John, Prof. Rise, Dr. Hernandez, LaToyna, Ming, and Jose. A subcommittee of two members must be formed to investigate the visitation policy in the dormitories. List all possible simple random samples of size 2. 77) _____
A) John and Prof. Rise, Prof. Rise and Dr. Hernandez, Dr. Hernandez and LaToyna, LaToyna and Ming, Ming and Jose
B) John and Prof. Rise, John and Dr. Hernandez, John and LaToyna, John and Ming, John and Jose
C) John and Prof. Rise, John and Dr. Hernandez, John and LaToyna, John and Ming, John and Jose, Prof. Rise and Dr. Hernandez, Prof. Rise and LaToyna, Prof. Rise and Ming, Prof. Rise and Jose, Dr. Hernandez and LaToyna, Dr. Hernandez and Ming, Dr. Hernandez and Jose, LaToyna and Ming, LaToyna and Jose, Ming and Jose
D) John and Prof. Rise, Dr. Hernandez and LaToyna, Ming and Jose
Answer: C

78) The top 38 cities in Wisconsin as determined by population are given below. Select a random sample of four cities from the list below using the two digit list of random numbers provided. Begin with the uppermost left random number and proceed down each column. When a column is complete, use the numbers at the top of the next right column and proceed down that column. Information was obtained from the web site <http://www.citypopulation.de/USA-Wisconsin.html>.

78) _____

Wisconsin Cities by Population

1	Milwaukee	9	Eau Claire	17	New Berlin	25	West Bend	33	Watertown
2	Madison	10	Janesville	18	Wausau	26	Superior	34	Muskego
3	Green Bay	11	West Allis	19	Greenfield	27	Mount Pleasant	35	De Pere
4	Kenosha	12	La Crosse	20	Beloit	28	Neeah	36	Fitchburg
5	Racine	13	Sheboygan	21	Manitowoc	29	Stevens Point	37	South Milwaukee
6	Appleton	14	Wauwatosa	22	Menomonee Falls	30	Caledonia	38	Grand Chute
7	Waukesha	15	Fond du Lac	23	Franklin	31	Sun Prairie		
8	Oshkosh	16	Brookfield	24	Oak Creek	32	Mequon		

Random Numbers

21	49	6	6	19	15	11	17
12	43	4	31	7	18	1	43
23	30	2	24	21	18	6	48
44	12	20	32	2	28	12	38
8	30	38	43	41	29	3	13

- A) Manitowoc, Appleton, Greenfield, Fond du Lac.
- B) Milwaukee, Madison, Green Bay, Kenosha.
- C) Manitowoc, La Crosse, Franklin, Oshkosh.
- D) Milwaukee, Eau Claire, New Berlin, West Bend.

Answer: C

Determine whether the underlined value is a parameter or a statistic.

79) In a survey conducted in the town of Atherton, 28% of adult respondents reported that they had been involved in at least one car accident in the past ten years.

79) _____

- A) parameter
- B) statistic

Answer: B

Determine what type of observational study is described. Explain.

80) Can money buy happiness? A researcher wanted to determine whether there was any association between economic status and happiness. She selected a sample of 1000 adults and interviewed them. Each person was asked about their financial situation and their level of happiness was evaluated. The researcher analyzed the results to determine whether there was an association between economic status and happiness.

80) _____

- A) retrospective; Individuals are asked to look back in time.
- B) cohort; Individuals are observed over a long period of time.
- C) cross-sectional; Information is collected at a specific point in time.

Answer: C

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

Provide an appropriate response.

- 81) A telephone poll asked 1480 registered voters "Would you vote for the current vice president if he ran for president?" Of these 1480 respondents, 38% would vote for the current vice president if he ran for president. The administrators of the study concluded that 38% of all registered voters would vote for the current vice president if he ran for president. Identify (a) the research objective, (b) the sample, (c) the descriptive statistics, and (d) the conclusions made in the study. 81) _____

Answer: (a) to determine the percentage of registered voters who would vote for the current vice president if he ran for president
(b) the 1480 registered voters surveyed
(c) 38% of the respondents supported reelection
(d) that 38% of all registered voters would vote for the current vice president if he ran for president

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

Determine whether the underlined value is a parameter or a statistic.

- 82) Mark retired from competitive athletics last year. In his career as a sprinter he had competed in the 100-meters event a total of 328 times. His average time for these 328 races was 10.24 seconds. 82) _____
A) parameter B) statistic

Answer: A

Determine the level of measurement of the variable.

- 83) an evaluation received by a physics student (excellent, good, satisfactory, or poor). 83) _____
A) ratio B) nominal C) ordinal D) interval

Answer: C

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

Provide an appropriate response.

- 84) A study was conducted to determine if listening to heavy metal music affects critical thinking. To test the claim, 134 subjects were randomly assigned to two groups. Both groups were administered a basic math skills exam. The first group took the exam while heavy metal music was piped into the exam room, while the second group took the exam in a silent room. The mean exam score for the first group was 85, and the mean exam score for the second group was 96. The researchers concluded that heavy metal music negatively affects critical thinking. Identify (a) the research objective, (b) the sample, (c) the descriptive statistics, and (d) the conclusions made in the study. 84) _____

Answer: (a) if listening to heavy metal music affects critical thinking
(b) the 134 subjects
(c) the mean exam score for the first group = 85, and the mean exam score for the second group was 96
(d) that heavy metal music negatively affects critical thinking

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

Determine the level of measurement of the variable.

- 85) the day of the month 85) _____
A) nominal B) interval C) ordinal D) ratio

Answer: B

Identify the type of sampling used.

- 86) A sample consists of every 50th worker from a group of 5000 workers. What sampling technique was used? 86) _____
- A) simple random
 - B) stratified
 - C) convenience
 - D) cluster
 - E) systematic

Answer: E

- 87) The names of 40 employees are written on 40 cards. The cards are placed in a bag, and three names are picked from the bag. What sampling technique was used? 87) _____
- A) stratified
 - B) simple random
 - C) cluster
 - D) systematic
 - E) convenience

Answer: B

Provide an appropriate response.

- 88) The United States can be divided into four geographical regions: Northeast, South, Midwest, and West. The Northeast region consists of 9 states; the South region consists of 16 states; the Midwest consists of 12 states; and the West consists of 13 states. If a survey is to be administered to the governors of 10 of the states and we want equal representation for the states in each of the four regions, how many states from the South should be selected? Round to the nearest whole state. 88) _____
- A) 4 B) 5 C) 3 D) 2

Answer: C

- 89) Which branch of statistics deals with the organization and summarization of collected information? 89) _____
- A) Computational statistics
 - B) Descriptive statistics
 - C) Inferential statistics
 - D) Survey design

Answer: B

Identify the type of sampling used.

- 90) To avoid working late, the plant foreman inspects the first 50 microwaves produced that day. What sampling technique was used? 90) _____
- A) stratified
 - B) cluster
 - C) systematic
 - D) simple random
 - E) convenience

Answer: E

Determine whether the quantitative variable is discrete or continuous.

- 91) the cholesterol levels of a group of adults the day after Thanksgiving 91) _____
- A) continuous
 - B) discrete

Answer: A

Determine the level of measurement of the variable.

- 92) an officer's rank in the military 92) _____
A) interval B) nominal C) ordinal D) ratio

Answer: C

- 93) a student's favorite sport 93) _____
A) ratio B) ordinal C) nominal D) interval

Answer: C

Provide an appropriate response.

- 94) An experiment in which neither the experimental unit nor the researcher in contact with the experimental unit knows which treatment the experimental unit is receiving is called a 94) _____

- A) randomized block design B) matched-pairs design
C) single-blind experiment D) double-blind experiment

Answer: D

Determine whether the quantitative variable is discrete or continuous.

- 95) the age of the oldest employee in the data processing department 95) _____
A) continuous B) discrete

Answer: A

Identify the type of sampling used.

- 96) In a recent online survey, participants were asked to answer "yes" or "no" to the question "Are you in favor of stricter gun control?" 6571 responded "yes" while 6037 responded "no". There was a fifty-cent charge for the call. What sampling technique was used? 96) _____

- A) stratified
B) systematic
C) simple random
D) convenience
E) cluster

Answer: D

Provide an appropriate response.

- 97) The city council of a small town needs to determine if the town's residents will support the building of a new library. The council decides to conduct a survey of a sample of the town's residents. Which one of the following procedures would be most appropriate for obtaining a sample of the town's residents? 97) _____

- A) Survey every 14th person who enters the old library on a given day.
B) Survey a random sample of librarians who live in the town.
C) Survey 500 individuals who are randomly selected from a list of all people living in the state in which the town is located.
D) Survey a random sample of persons within each neighborhood of the town.

Answer: D

Determine the level of measurement of the variable.

- 98) capacity of a backpack 98) _____
A) nominal B) interval C) ratio D) ordinal

Answer: C

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

Provide an appropriate response.

99) What is a factor?

99) _____

Answer: A factor is the variable whose effect on the response variable is to be assessed by the experimenter.

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

100) A salesman boasts to a farmer that his new fertilizer will increase the yield of the farmer's crops by 15%. The farmer wishes to test the effects of the new fertilizer on her corn yield. She has four equal sized plots of land—one with sandy soil, one with rocky soil, one with clay-rich soil, and one with average soil. She divides each of the four plots into three equal sized portions and randomly labels them A, B and C. The four A portions are treated with her old fertilizer. The four B portions are treated with the new fertilizer. The four C portions receive no fertilizer. At harvest time, the corn yield is recorded for each section of land. What is the claim she is testing? 100) _____

- A) The average soil field had at least a 15% increase in yield.
- B) The A sections had at least a 15% increase in yield.
- C) The new fertilizer yielded at least a 15% improvement.
- D) The total yield increased at least 15%.

Answer: C

101) Which of the following is not true about factors? 101) _____

- A) One way to control factors is to fix their level at one predetermined value throughout the experiment.
- B) Factors whose effect on the response variable is not of interest can be set after the experiment.
- C) Any combination of the values of the factors is called a treatment.
- D) Factors whose effect on the response variable interests us should be set at predetermined levels.

Answer: B

Identify the type of sampling used.

102) A lobbyist for the oil industry assigns a number to each senator and then uses a computer to randomly generate ten numbers. The lobbyist contacts the senators corresponding to these numbers. What sampling technique was used? 102) _____

- A) cluster
- B) simple random
- C) systematic
- D) convenience
- E) stratified

Answer: B

Provide an appropriate response.

103) Which type of bias occurs because we do not obtain complete information about a population? 103) _____

- A) no bias
- B) sampling bias
- C) nonresponse bias
- D) response bias

Answer: B

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

104) What is a designed experiment?

104) _____

Answer: A designed experiment is a controlled study in which treatments are applied to experimental units, and the effect of varying these treatments on a response variable is observed.

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

Determine whether the study depicts an observational study or an experiment.

105) The personnel director at a large company would like to determine whether the company cafeteria is widely used by employees. She calls each employee and asks them whether they usually bring their own lunch, eat at the company cafeteria, or go out for lunch.

105) _____

A) observational study

B) experiment

Answer: A

Determine whether the underlined value is a parameter or a statistic.

106) 28.2% of the mayors of cities in a certain state are from minority groups.

106) _____

A) statistic

B) parameter

Answer: B

Determine whether the study depicts an observational study or an experiment.

107) A medical researcher obtains a sample of adults suffering from diabetes. She randomly assigns 87 people to a treatment group and 87 to a placebo group. The treatment group receives a medication over a period of three months and the placebo group receives a placebo over the same time frame. At the end of three months the patients' symptoms are evaluated.

107) _____

A) experiment

B) observational study

Answer: A

Solve the problem.

108) An international relations professor is supervising four master's students. Information about the students is summarized in the table.

108) _____

Student Name	Student Number	Area of Interest	GPA
Anna	914589205	Africa	3.64
Pierre	981672635	Middle East	3.80
Juan	906539012	Latin America	3.19
Yoko	977530271	Asia	3.25

Identify the variables and determine whether each variable is quantitative or qualitative.

A) student number: qualitative; area of interest: qualitative; GPA: qualitative

B) student number: qualitative; area of interest: qualitative; GPA: quantitative

C) student number: quantitative; area of interest: qualitative; GPA: qualitative

D) student number: quantitative; area of interest: qualitative; GPA: quantitative

Answer: B

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

Provide an appropriate response.

109) What is statistics?

109) _____

Answer: Statistics is the science of collecting, summarizing, organizing, and analyzing information in order to answer questions or draw conclusions.

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

Identify the type of sampling used.

110) A writer for an art magazine randomly selects and interviews fifty male and fifty female artists. 110) _____
What sampling technique is used?

- A) simple random
- B) cluster
- C) systematic
- D) stratified
- E) convenience

Answer: D

111) An education researcher randomly selects 55 of the nation's junior colleges and interviews all of the professors at each school. What sampling technique was used? 111) _____

- A) simple random
- B) convenience
- C) systematic
- D) cluster
- E) stratified

Answer: D

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

Provide an appropriate response.

112) A survey of 1222 American households found that 76% of the households own at least two bicycles. Identify the population, the sample, and the individuals in the study. 112) _____

Answer: population: collection of all American households; sample: collection of 1222 American households surveyed; individuals: each household

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

113) A medical journal published the results of an experiment on anxiety. The experiment investigated the effects of a controversial new therapy for anxiety. Researchers measured the anxiety levels of 91 adult women who suffer moderate conditions of the disorder. After the therapy, the researchers again measured the women's anxiety levels. The differences between the the pre- and post-therapy anxiety levels were reported. What type of experimental design is this? 113) _____

- A) matched-pairs design
- B) completely randomized design
- C) single-blind design
- D) randomized block design

Answer: A

Classify the variable as qualitative or quantitative.

114) the colors of book covers on a bookshelf 114) _____
A) quantitative B) qualitative

Answer: B

Provide an appropriate response.

115) What will help insure that the effect of a treatment is not due to some characteristic of a single experimental unit? 115) _____

- A) blinding
- B) randomizing
- C) blocking
- D) replication

Answer: D

Identify the type of sampling used.

- 116) Every fifth adult entering an airport is checked for extra security screening. What sampling technique is used? 116) _____
- A) simple random
 - B) systematic
 - C) cluster
 - D) convenience
 - E) stratified

Answer: B

Provide an appropriate response.

- 117) A drug company wanted to test a new indigestion medication. The researchers found 100 adults aged 25-35 and randomly assigned them to two groups. The first group received the new drug, while the second received a placebo. After one month of treatment, the percentage of each group whose indigestion symptoms decreased was recorded and compared. What is the response variable in this experiment? 117) _____
- A) the type of drug (medication or placebo)
 - B) the percentage who had decreased indigestion symptoms
 - C) the one month treatment time
 - D) the 100 adults aged 25-35

Answer: B

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

- 118) What is a factor? 118) _____
- Answer: A factor is the variable whose effect on the response variable is to be assessed by the experimenter.

- 119) Before opening a new dealership, an auto manufacturer wants to gather information about car ownership and driving habits of the local residents. The marketing manager of the company randomly selects 1000 households from all households in the area and mails a questionnaire to them. Of the 1000 surveys mailed, she receives 105 back. Determine the type of bias. 119) _____
- Answer: Nonresponse bias

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

- 120) What will help insure that the effect of a treatment is not due to some characteristic of a single experimental unit? 120) _____
- A) blocking B) randomizing C) replication D) blinding
- Answer: C

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

- 121) An online newspaper conducted a survey by asking, "Do you support the lowering of air quality standards if it could cause the death of millions of innocent people from pollution related diseases?" Determine the type of bias. 121) _____
- Answer: Response bias; poorly worded question

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

Determine the level of measurement of the variable.

122) category of storm (gale, hurricane, etc.)

A) ratio

B) interval

C) ordinal

D) nominal

122) _____

Answer: C

Answer Key

Testname: CH01

- 1) D
- 2) B
- 3) D
- 4) D
- 5) B
- 6) B
- 7) B
- 8) B
- 9) A
- 10) A
- 11) B
- 12) C
- 13) A
- 14) C
- 15) A
- 16) A
- 17) A
- 18) A
- 19) A
- 20) A
- 21) A
- 22) B
- 23) B
- 24) A
- 25) B
- 26) C
- 27) C
- 28) A
- 29) A
- 30) A
- 31) A
- 32) A
- 33) B
- 34) C
- 35) C
- 36) B
- 37) C
- 38) C
- 39) C
- 40) B
- 41) population: collection of all American households; sample: collection of 1027 American households surveyed;
individuals: each household
- 42) B
- 43) C
- 44) D
- 45) C
- 46) B
- 47) D
- 48) A
- 49) B

Answer Key

Testname: CH01

- 50) B
- 51) B
- 52) B
- 53) D
- 54) B
- 55) Sampling bias; the customers are not chosen through a random sample.
- 56) D
- 57) B
- 58) B
- 59) D
- 60) A
- 61) D
- 62) B
- 63) A
- 64) A
- 65) B
- 66) C
- 67) C
- 68) E
- 69) A
- 70) A
- 71) A
- 72) C
- 73) A
- 74) B
- 75) B
- 76) The population of interest is the student loan debt incurred by all graduates of the university. The sample is student loan debt of the 270 graduating seniors that were collected by the university administrators. The individuals are each graduating senior whose student loan debt was recorded.
- 77) C
- 78) C
- 79) B
- 80) C
- 81) (a) to determine the percentage of registered voters who would vote for the current vice president if he ran for president
(b) the 1480 registered voters surveyed
(c) 38% of the respondents supported reelection
(d) that 38% of all registered voters would vote for the current vice president if he ran for president
- 82) A
- 83) C
- 84) (a) if listening to heavy metal music affects critical thinking
(b) the 134 subjects
(c) the mean exam score for the first group = 85, and the mean exam score for the second group was 96
(d) that heavy metal music negatively affects critical thinking
- 85) B
- 86) E
- 87) B
- 88) C
- 89) B
- 90) E
- 91) A

Answer Key

Testname: CH01

- 92) C
- 93) C
- 94) D
- 95) A
- 96) D
- 97) D
- 98) C
- 99) A factor is the variable whose effect on the response variable is to be assessed by the experimenter.
- 100) C
- 101) B
- 102) B
- 103) B
- 104) A designed experiment is a controlled study in which treatments are applied to experimental units, and the effect of varying these treatments on a response variable is observed.
- 105) A
- 106) B
- 107) A
- 108) B
- 109) Statistics is the science of collecting, summarizing, organizing, and analyzing information in order to answer questions or draw conclusions.
- 110) D
- 111) D
- 112) population: collection of all American households; sample: collection of 1222 American households surveyed; individuals: each household
- 113) A
- 114) B
- 115) D
- 116) B
- 117) B
- 118) A factor is the variable whose effect on the response variable is to be assessed by the experimenter.
- 119) Nonresponse bias
- 120) C
- 121) Response bias; poorly worded question
- 122) C