Chapter 1

*Student: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*

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| 1. | A population is a set of units (usually people, objects, or events).    True    False |

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| 2. | If we examine half of the population measurements, we are conducting a census of the population.    True    False |

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| 3. | A random sample is selected so that, on each selection from the population, every unit remaining in the population on that selection has the same chance of being chosen.    True    False |

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| 4. | A process is in statistical control if it does not exhibit any unusual process variations.    True    False |

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| 5. | An example of a quantitative variable is the make of a car.    True    False |

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| 6. | An example of a qualitative variable is the fuel efficiency of a car, measured in L/100km.    True    False |

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| 7. | Statistical inference is the science of using a sample of measurements to make generalizations about the important aspects of a population of measurements.    True    False |

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| 8. | If we sample without replacement, we do not place the unit chosen on a particular selection back into the population.    True    False |

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| 9. | By taking a systematic sample, in which we select every 100th shopper arriving at a specific store, we are approximating a random sample of shoppers.    True    False |

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| 10. | Nonresponse reduces the sample size and may have a negative impact on the generalization of results if the individuals who do not respond are themselves nonrandom.    True    False |

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| 11. | Undercoverage is when some units of the population are mistakenly included in the sample.    True    False |

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| 12. | Suppose that the six students listed below have applied for a bursary.  1. Justin 2. Gordon 3. Ahmed 4. Melanie 5. Olga 6. Ian  Only three students can receive the bursary. Because they have all met the criteria for the bursary, the three students who will receive the bursary will be selected at random. Consider the following list of random digits from a random number table:  27102 56027 55892 33063 41842 81868 71035 09001 43367 49497 54580 81507  Starting with the leftmost digit, use this list of random digits to choose a simple random sample of three students from the six students listed above. The sample you obtain is      |  |  | | --- | --- | | A. | Olga, Ian, and Ahmed. |  |  |  | | --- | --- | | B. | Melanie, Ahmed, and Ian. |  |  |  | | --- | --- | | C. | Justin, Gordon, and Olga. |  |  |  | | --- | --- | | D. | Justin, Gordon, and Gordon again. |  |  |  | | --- | --- | | E. | any set of 3 names, but we must exclude Gordon. | |

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| 13. | Ratio variables have the following unique characteristic:      |  |  | | --- | --- | | A. | Meaningful order |  |  |  | | --- | --- | | B. | An arbitrarily defined zero value |  |  |  | | --- | --- | | C. | Categorical in nature |  |  |  | | --- | --- | | D. | Predictable with 100% accuracy |  |  |  | | --- | --- | | E. | Equal distance between points | |

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| 14. | When we are choosing a random sample and we do not place chosen units back into the population, we are      |  |  | | --- | --- | | A. | sampling with replacement. |  |  |  | | --- | --- | | B. | sampling by convenience. |  |  |  | | --- | --- | | C. | using a systematic sample. |  |  |  | | --- | --- | | D. | using a voluntary response sample. |  |  |  | | --- | --- | | E. | sampling without replacement. | |

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| 15. | Which one of the following is a quantitative variable?      |  |  | | --- | --- | | A. | The make of a TV. |  |  |  | | --- | --- | | B. | A person's gender. |  |  |  | | --- | --- | | C. | A person's height. |  |  |  | | --- | --- | | D. | Whether a person is an university graduate or not. |  |  |  | | --- | --- | | E. | Whether a person has a credit card. | |

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| 16. | Which one of the following is a categorical variable?      |  |  | | --- | --- | | A. | Air temperature. |  |  |  | | --- | --- | | B. | Bank account balance. |  |  |  | | --- | --- | | C. | Daily sales in a store. |  |  |  | | --- | --- | | D. | Whether a person has a traffic violation. |  |  |  | | --- | --- | | E. | Value of company stock. | |

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| 17. | Measurements from a population are also known as      |  |  | | --- | --- | | A. | statistics. |  |  |  | | --- | --- | | B. | observations. |  |  |  | | --- | --- | | C. | variables. |  |  |  | | --- | --- | | D. | processes. |  |  |  | | --- | --- | | E. | functions. | |

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| 18. | If the runs plot for a process shows increasing variation around a constant level, then the process is      |  |  | | --- | --- | | A. | reliable. |  |  |  | | --- | --- | | B. | capable. |  |  |  | | --- | --- | | C. | profitable. |  |  |  | | --- | --- | | D. | predictable. |  |  |  | | --- | --- | | E. | out of control. | |

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| 19. | The two levels of measurement for quantitative variables are      |  |  | | --- | --- | | A. | ordinal and ratio. |  |  |  | | --- | --- | | B. | interval and ordinal. |  |  |  | | --- | --- | | C. | nominative and ordinal. |  |  |  | | --- | --- | | D. | interval and ratio. |  |  |  | | --- | --- | | E. | nominative and interval. | |

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| 20. | Temperature, (in degrees Celsius) is an example of a(n) \_\_\_\_\_\_\_\_ variable.      |  |  | | --- | --- | | A. | nominative |  |  |  | | --- | --- | | B. | ordinal |  |  |  | | --- | --- | | C. | interval |  |  |  | | --- | --- | | D. | ratio |  |  |  | | --- | --- | | E. | random | |

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| 21. | Jersey numbers of soccer players are an example of a(n) \_\_\_\_\_\_\_\_\_\_\_ variable.      |  |  | | --- | --- | | A. | nominative |  |  |  | | --- | --- | | B. | ordinal |  |  |  | | --- | --- | | C. | interval |  |  |  | | --- | --- | | D. | ratio |  |  |  | | --- | --- | | E. | random | |

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| 22. | Weights of items obtained using a well-adjusted scale represents a(n) \_\_\_\_\_\_\_\_\_\_\_\_\_ level of measurement.      |  |  | | --- | --- | | A. | nominative |  |  |  | | --- | --- | | B. | ordinal |  |  |  | | --- | --- | | C. | interval |  |  |  | | --- | --- | | D. | ratio |  |  |  | | --- | --- | | E. | balanced | |

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| 23. | An identification of police officers by rank would represent a(n) \_\_\_\_\_\_\_\_\_\_\_\_ level of measurement.      |  |  | | --- | --- | | A. | nominative |  |  |  | | --- | --- | | B. | ordinal |  |  |  | | --- | --- | | C. | interval |  |  |  | | --- | --- | | D. | ratio |  |  |  | | --- | --- | | E. | professional | |

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| 24. | \_\_\_\_\_\_\_\_\_\_ is a necessary component of a runs plot.      |  |  | | --- | --- | | A. | Observation over time |  |  |  | | --- | --- | | B. | A qualitative variable |  |  |  | | --- | --- | | C. | Random sampling of the data |  |  |  | | --- | --- | | D. | Voluntary response data |  |  |  | | --- | --- | | E. | A Likert scale survey | |

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| 25. | \_\_\_\_\_\_\_\_\_\_\_\_\_\_ is the science of using a sample of measurements to make generalizations about the important aspects of a population.      |  |  | | --- | --- | | A. | Statistical process control |  |  |  | | --- | --- | | B. | Descriptive statistics |  |  |  | | --- | --- | | C. | Random sample |  |  |  | | --- | --- | | D. | Statistical inference |  |  |  | | --- | --- | | E. | Deductive reasoning | |

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| 26. | Degree program entrance exam scores, such as MCAT scores, are an example of a(n) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ variable.      |  |  | | --- | --- | | A. | ordinal |  |  |  | | --- | --- | | B. | ratio |  |  |  | | --- | --- | | C. | nominative |  |  |  | | --- | --- | | D. | interval |  |  |  | | --- | --- | | E. | undefined | |

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| 27. | The number of kilometres a truck is driven before it is overhauled is an example of a(n) \_\_\_\_\_\_\_\_\_\_\_\_\_ variable.      |  |  | | --- | --- | | A. | nominative |  |  |  | | --- | --- | | B. | ordinal |  |  |  | | --- | --- | | C. | interval |  |  |  | | --- | --- | | D. | ratio |  |  |  | | --- | --- | | E. | maintenance | |

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| 28. | Which one of the following sampling methods would generally lead to the least reliable statistical inferences about the population from which the sample has been selected?       |  |  | | --- | --- | | A. | A random sample selected without replacement. |  |  |  | | --- | --- | | B. | A random sample selected with replacement. |  |  |  | | --- | --- | | C. | A voluntary response sample. |  |  |  | | --- | --- | | D. | A systematic sample. |  |  |  | | --- | --- | | E. | A stratified random sample. | |

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| 29. | A(n) \_\_\_\_\_ variable is a qualitative variable such that there is no meaningful ordering or ranking of the categories.      |  |  | | --- | --- | | A. | ratio |  |  |  | | --- | --- | | B. | ordinal |  |  |  | | --- | --- | | C. | nominative |  |  |  | | --- | --- | | D. | interval |  |  |  | | --- | --- | | E. | random | |

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| 30. | A person's telephone area code is an example of a(n) \_\_\_\_\_\_\_\_\_\_\_\_\_ variable.      |  |  | | --- | --- | | A. | nominative |  |  |  | | --- | --- | | B. | ordinal |  |  |  | | --- | --- | | C. | interval |  |  |  | | --- | --- | | D. | ratio |  |  |  | | --- | --- | | E. | independent | |

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| 31. | Any characteristic of a population unit is a(n):      |  |  | | --- | --- | | A. | measurement |  |  |  | | --- | --- | | B. | sample |  |  |  | | --- | --- | | C. | observation |  |  |  | | --- | --- | | D. | variable |  |  |  | | --- | --- | | E. | trait | |

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| 32. | A list of all of the units in a population is called a \_\_\_\_\_.      |  |  | | --- | --- | | A. | census |  |  |  | | --- | --- | | B. | frame |  |  |  | | --- | --- | | C. | random sample |  |  |  | | --- | --- | | D. | variable |  |  |  | | --- | --- | | E. | systematic sample | |

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| 33. | The two levels of measurement for qualitative variables are      |  |  | | --- | --- | | A. | ordinal and ratio. |  |  |  | | --- | --- | | B. | interval and ordinal. |  |  |  | | --- | --- | | C. | nominative and ordinal. |  |  |  | | --- | --- | | D. | interval and ratio. |  |  |  | | --- | --- | | E. | nominative and interval. | |

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| 34. | Each customer in a market research study is asked to identify their favourite beverage. The level of measurement for this study would be at the \_\_\_\_\_ level.      |  |  | | --- | --- | | A. | nominal |  |  |  | | --- | --- | | B. | ordinal |  |  |  | | --- | --- | | C. | interval |  |  |  | | --- | --- | | D. | ratio |  |  |  | | --- | --- | | E. | quantitative | |

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| 35. | In sampling from the population, a \_\_\_\_\_ is a unique group representing a segment of the population of interest and which has been predetermined by the researcher.      |  |  | | --- | --- | | A. | focus group |  |  |  | | --- | --- | | B. | system |  |  |  | | --- | --- | | C. | parliament |  |  |  | | --- | --- | | D. | response |  |  |  | | --- | --- | | E. | stratum | |

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| 36. | When a researcher uses a(n) \_\_\_\_\_ sample, they decrease bias in the sample.      |  |  | | --- | --- | | A. | voluntary response |  |  |  | | --- | --- | | B. | small |  |  |  | | --- | --- | | C. | expensive |  |  |  | | --- | --- | | D. | random |  |  |  | | --- | --- | | E. | convenience | |

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| 37. | A researcher believes a person's gender will influence their answer to a particular question. In order to take this into account, the researcher selects a random sample of 100 men and another random sample of 100 women. This is an example of a \_\_\_\_\_\_ sample.      |  |  | | --- | --- | | A. | stratified random |  |  |  | | --- | --- | | B. | simple random |  |  |  | | --- | --- | | C. | biased |  |  |  | | --- | --- | | D. | multistage cluster |  |  |  | | --- | --- | | E. | systematic | |

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| 38. | A \_\_\_\_\_ plot is a graph of individual process measurements versus time.       |  |  | | --- | --- | | A. | line |  |  |  | | --- | --- | | B. | runs |  |  |  | | --- | --- | | C. | scatter |  |  |  | | --- | --- | | D. | pie-chart |  |  |  | | --- | --- | | E. | stem | |

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| 39. | A machine produces pencils. At the start of the day, the potential number of pencils produced is \_\_\_\_\_. At the end of the day, the actual number of pencils produced is \_\_\_\_\_.      |  |  | | --- | --- | | A. | finite, infinite |  |  |  | | --- | --- | | B. | actual, probable |  |  |  | | --- | --- | | C. | infinite, finite |  |  |  | | --- | --- | | D. | staged, actual |  |  |  | | --- | --- | | E. | controlled, measured | |

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| 40. | If a process does not exhibit any unusual process variations, then the process is said to be in \_\_\_\_\_\_\_\_\_.    \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

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| 41. | Any characteristic of a population unit is called a \_\_\_\_\_.    \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

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| 42. | If a process is in statistical control, then the runs plot for the process will exhibit a(n) \_\_\_\_\_\_\_ amount of variation around a constant, or horizontal, level.    \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

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| 43. | A \_\_\_\_\_ is an examination of all the population measurements.    \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

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| 44. | When a population unit selected as part of the sample cannot be contacted or refuses to participate, then we say that \_\_\_\_\_\_\_\_\_ has occurred.    \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

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| 45. | A \_\_\_\_\_ is a list of all the units in a population.    \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

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| 46. | The process of assigning a value of a variable to each unit in a population or sample is called \_\_\_\_\_.    \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

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| 47. | A \_\_\_\_ is a graph of individual process measurements versus time.    \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

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| 48. | Statistical \_\_\_\_\_ refers to using a sample of measurements to make generalizations about the important aspects of a population.    \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

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| 49. | A \_\_\_\_\_ is a subset of the units in a population.    \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

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| 50. | A \_\_\_\_\_ variable can have values that are numbers on the real number line.    \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

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| 51. | A sequence of operations that takes inputs and turns them into outputs is a \_\_\_\_\_.    \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

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| 52. | A \_\_\_\_\_\_\_\_\_ variable records into which of several categories a population unit falls.    \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

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| 53. | A set of units we wish to study is called a \_\_\_\_\_.    \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

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| 54. | \_\_\_\_\_ is the science of describing the important aspects of a set of measurements.    \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

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| 55. | In situations when it is not possible to number all of the units in a population, we often use a \_\_\_\_\_ sample to approximate a random sample.    \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

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| 56. | A runs plot with an increasing trend would indicate that the corresponding process is \_\_\_\_\_.    \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

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| 57. | If a unit is placed back into the population after being selected for a sample, we are sampling \_\_\_\_\_ replacement.    \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

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| 58. | A \_\_\_\_\_ table is used to help select items for a random sample.    \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

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| 59. | A process that is in statistical control does not necessarily imply that the process is \_\_\_\_\_\_\_\_\_\_ of meeting the customer requirements.    \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

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| 60. | A consumer's yes/no reply to a survey question is what type of variable? |

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| 61. | The change in daily price of a stock is what type of variable? |

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| 62. | List two types of random sampling methods. |

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| 63. | In a voluntary response sample, what types of opinions are usually expressed? |

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| 64. | Describe one weakness and one advantage to mailed surveys. |

Chapter 1 Key

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| 1. | A population is a set of units (usually people, objects, or events).    **TRUE** |

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| *Accessibility: Keyboard Navigation Bowerman - Chapter 01 #1 Difficulty: Easy Learning Objective: 01-01 Explain the function of research samples* |

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| 2. | If we examine half of the population measurements, we are conducting a census of the population.    **FALSE** |

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| *Accessibility: Keyboard Navigation Bowerman - Chapter 01 #2 Difficulty: Medium Learning Objective: 01-01 Explain the function of research samples* |

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| 3. | A random sample is selected so that, on each selection from the population, every unit remaining in the population on that selection has the same chance of being chosen.    **TRUE** |

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| *Accessibility: Keyboard Navigation Bowerman - Chapter 01 #3 Difficulty: Easy Learning Objective: 01-02 Define the term random sample* |

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| 4. | A process is in statistical control if it does not exhibit any unusual process variations.    **TRUE** |

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| *Accessibility: Keyboard Navigation Bowerman - Chapter 01 #4 Difficulty: Easy Learning Objective: 01-04 Describe how a process is sampled* |

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| 5. | An example of a quantitative variable is the make of a car.    **FALSE** |

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| *Accessibility: Keyboard Navigation Bowerman - Chapter 01 #5 Difficulty: Easy Learning Objective: 01-05 Identify the first four levels of measurement* |

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| 6. | An example of a qualitative variable is the fuel efficiency of a car, measured in L/100km.    **FALSE** |

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| *Accessibility: Keyboard Navigation Bowerman - Chapter 01 #6 Difficulty: Easy Learning Objective: 01-05 Identify the first four levels of measurement* |

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| 7. | Statistical inference is the science of using a sample of measurements to make generalizations about the important aspects of a population of measurements.    **TRUE** |

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| *Accessibility: Keyboard Navigation Bowerman - Chapter 01 #7 Difficulty: Medium Learning Objective: 01-01 Explain the function of research samples* |

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| 8. | If we sample without replacement, we do not place the unit chosen on a particular selection back into the population.    **TRUE** |

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| *Accessibility: Keyboard Navigation Bowerman - Chapter 01 #8 Difficulty: Medium Learning Objective: 01-02 Define the term random sample* |

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| 9. | By taking a systematic sample, in which we select every 100th shopper arriving at a specific store, we are approximating a random sample of shoppers.    **TRUE** |

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| *Accessibility: Keyboard Navigation Bowerman - Chapter 01 #9 Difficulty: Medium Learning Objective: 01-03 Explain how a random sample can be generated* |

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| 10. | Nonresponse reduces the sample size and may have a negative impact on the generalization of results if the individuals who do not respond are themselves nonrandom.    **TRUE** |

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| *Accessibility: Keyboard Navigation Bowerman - Chapter 01 #10 Difficulty: Hard Gradable: manual Learning Objective: 01-06 List some of the potential problems associated with surveys* |

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| 11. | Undercoverage is when some units of the population are mistakenly included in the sample.    **FALSE** |

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| *Accessibility: Keyboard Navigation Bowerman - Chapter 01 #11 Difficulty: Medium Learning Objective: 01-06 List some of the potential problems associated with surveys* |

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| 12. | Suppose that the six students listed below have applied for a bursary.  1. Justin 2. Gordon 3. Ahmed 4. Melanie 5. Olga 6. Ian  Only three students can receive the bursary. Because they have all met the criteria for the bursary, the three students who will receive the bursary will be selected at random. Consider the following list of random digits from a random number table:  27102 56027 55892 33063 41842 81868 71035 09001 43367 49497 54580 81507  Starting with the leftmost digit, use this list of random digits to choose a simple random sample of three students from the six students listed above. The sample you obtain is      |  |  | | --- | --- | | A. | Olga, Ian, and Ahmed. |  |  |  | | --- | --- | | B. | Melanie, Ahmed, and Ian. |  |  |  | | --- | --- | | **C.** | Justin, Gordon, and Olga. |  |  |  | | --- | --- | | D. | Justin, Gordon, and Gordon again. |  |  |  | | --- | --- | | E. | any set of 3 names, but we must exclude Gordon. | |

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| *Accessibility: Keyboard Navigation Bowerman - Chapter 01 #12 Difficulty: Easy Learning Objective: 01-03 Explain how a random sample can be generated* |

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| 13. | Ratio variables have the following unique characteristic:      |  |  | | --- | --- | | A. | Meaningful order |  |  |  | | --- | --- | | B. | An arbitrarily defined zero value |  |  |  | | --- | --- | | C. | Categorical in nature |  |  |  | | --- | --- | | D. | Predictable with 100% accuracy |  |  |  | | --- | --- | | **E.** | Equal distance between points | |

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| *Accessibility: Keyboard Navigation Bowerman - Chapter 01 #13 Difficulty: Easy Learning Objective: 01-05 Identify the first four levels of measurement* |

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| 14. | When we are choosing a random sample and we do not place chosen units back into the population, we are      |  |  | | --- | --- | | A. | sampling with replacement. |  |  |  | | --- | --- | | B. | sampling by convenience. |  |  |  | | --- | --- | | C. | using a systematic sample. |  |  |  | | --- | --- | | D. | using a voluntary response sample. |  |  |  | | --- | --- | | **E.** | sampling without replacement. | |

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| *Accessibility: Keyboard Navigation Bowerman - Chapter 01 #14 Difficulty: Medium Learning Objective: 01-02 Define the term random sample* |

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| 15. | Which one of the following is a quantitative variable?      |  |  | | --- | --- | | A. | The make of a TV. |  |  |  | | --- | --- | | B. | A person's gender. |  |  |  | | --- | --- | | **C.** | A person's height. |  |  |  | | --- | --- | | D. | Whether a person is an university graduate or not. |  |  |  | | --- | --- | | E. | Whether a person has a credit card. | |

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| *Accessibility: Keyboard Navigation Bowerman - Chapter 01 #15 Difficulty: Easy Learning Objective: 01-05 Identify the first four levels of measurement* |

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| 16. | Which one of the following is a categorical variable?      |  |  | | --- | --- | | A. | Air temperature. |  |  |  | | --- | --- | | B. | Bank account balance. |  |  |  | | --- | --- | | C. | Daily sales in a store. |  |  |  | | --- | --- | | **D.** | Whether a person has a traffic violation. |  |  |  | | --- | --- | | E. | Value of company stock. | |

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| *Accessibility: Keyboard Navigation Bowerman - Chapter 01 #16 Difficulty: Medium Learning Objective: 01-05 Identify the first four levels of measurement* |

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| 17. | Measurements from a population are also known as      |  |  | | --- | --- | | A. | statistics. |  |  |  | | --- | --- | | **B.** | observations. |  |  |  | | --- | --- | | C. | variables. |  |  |  | | --- | --- | | D. | processes. |  |  |  | | --- | --- | | E. | functions. | |

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| *Accessibility: Keyboard Navigation Bowerman - Chapter 01 #17 Difficulty: Medium Learning Objective: 01-01 Explain the function of research samples* |

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| 18. | If the runs plot for a process shows increasing variation around a constant level, then the process is      |  |  | | --- | --- | | A. | reliable. |  |  |  | | --- | --- | | B. | capable. |  |  |  | | --- | --- | | C. | profitable. |  |  |  | | --- | --- | | D. | predictable. |  |  |  | | --- | --- | | **E.** | out of control. | |

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| *Accessibility: Keyboard Navigation Bowerman - Chapter 01 #18 Difficulty: Easy Learning Objective: 01-04 Describe how a process is sampled* |

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| 19. | The two levels of measurement for quantitative variables are      |  |  | | --- | --- | | A. | ordinal and ratio. |  |  |  | | --- | --- | | B. | interval and ordinal. |  |  |  | | --- | --- | | C. | nominative and ordinal. |  |  |  | | --- | --- | | **D.** | interval and ratio. |  |  |  | | --- | --- | | E. | nominative and interval. | |

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| *Accessibility: Keyboard Navigation Bowerman - Chapter 01 #19 Difficulty: Medium Learning Objective: 01-05 Identify the first four levels of measurement* |

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| 20. | Temperature, (in degrees Celsius) is an example of a(n) \_\_\_\_\_\_\_\_ variable.      |  |  | | --- | --- | | A. | nominative |  |  |  | | --- | --- | | B. | ordinal |  |  |  | | --- | --- | | **C.** | interval |  |  |  | | --- | --- | | D. | ratio |  |  |  | | --- | --- | | E. | random | |

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| *Accessibility: Keyboard Navigation Bowerman - Chapter 01 #20 Difficulty: Medium Learning Objective: 01-05 Identify the first four levels of measurement* |

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| 21. | Jersey numbers of soccer players are an example of a(n) \_\_\_\_\_\_\_\_\_\_\_ variable.      |  |  | | --- | --- | | **A.** | nominative |  |  |  | | --- | --- | | B. | ordinal |  |  |  | | --- | --- | | C. | interval |  |  |  | | --- | --- | | D. | ratio |  |  |  | | --- | --- | | E. | random | |

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| *Accessibility: Keyboard Navigation Bowerman - Chapter 01 #21 Difficulty: Medium Learning Objective: 01-05 Identify the first four levels of measurement* |

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| 22. | Weights of items obtained using a well-adjusted scale represents a(n) \_\_\_\_\_\_\_\_\_\_\_\_\_ level of measurement.      |  |  | | --- | --- | | A. | nominative |  |  |  | | --- | --- | | B. | ordinal |  |  |  | | --- | --- | | C. | interval |  |  |  | | --- | --- | | **D.** | ratio |  |  |  | | --- | --- | | E. | balanced | |

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| *Accessibility: Keyboard Navigation Bowerman - Chapter 01 #22 Difficulty: Medium Learning Objective: 01-05 Identify the first four levels of measurement* |

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| 23. | An identification of police officers by rank would represent a(n) \_\_\_\_\_\_\_\_\_\_\_\_ level of measurement.      |  |  | | --- | --- | | A. | nominative |  |  |  | | --- | --- | | **B.** | ordinal |  |  |  | | --- | --- | | C. | interval |  |  |  | | --- | --- | | D. | ratio |  |  |  | | --- | --- | | E. | professional | |

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| *Accessibility: Keyboard Navigation Bowerman - Chapter 01 #23 Difficulty: Medium Learning Objective: 01-05 Identify the first four levels of measurement* |

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| 24. | \_\_\_\_\_\_\_\_\_\_ is a necessary component of a runs plot.      |  |  | | --- | --- | | **A.** | Observation over time |  |  |  | | --- | --- | | B. | A qualitative variable |  |  |  | | --- | --- | | C. | Random sampling of the data |  |  |  | | --- | --- | | D. | Voluntary response data |  |  |  | | --- | --- | | E. | A Likert scale survey | |

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| *Accessibility: Keyboard Navigation Bowerman - Chapter 01 #24 Difficulty: Medium Learning Objective: 01-04 Describe how a process is sampled* |

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| 25. | \_\_\_\_\_\_\_\_\_\_\_\_\_\_ is the science of using a sample of measurements to make generalizations about the important aspects of a population.      |  |  | | --- | --- | | A. | Statistical process control |  |  |  | | --- | --- | | B. | Descriptive statistics |  |  |  | | --- | --- | | C. | Random sample |  |  |  | | --- | --- | | **D.** | Statistical inference |  |  |  | | --- | --- | | E. | Deductive reasoning | |

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| *Accessibility: Keyboard Navigation Bowerman - Chapter 01 #25 Difficulty: Easy Learning Objective: 01-01 Explain the function of research samples* |

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| 26. | Degree program entrance exam scores, such as MCAT scores, are an example of a(n) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ variable.      |  |  | | --- | --- | | A. | ordinal |  |  |  | | --- | --- | | B. | ratio |  |  |  | | --- | --- | | C. | nominative |  |  |  | | --- | --- | | **D.** | interval |  |  |  | | --- | --- | | E. | undefined | |

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| *Accessibility: Keyboard Navigation Bowerman - Chapter 01 #26 Difficulty: Hard Learning Objective: 01-05 Identify the first four levels of measurement* |

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| 27. | The number of kilometres a truck is driven before it is overhauled is an example of a(n) \_\_\_\_\_\_\_\_\_\_\_\_\_ variable.      |  |  | | --- | --- | | A. | nominative |  |  |  | | --- | --- | | B. | ordinal |  |  |  | | --- | --- | | C. | interval |  |  |  | | --- | --- | | **D.** | ratio |  |  |  | | --- | --- | | E. | maintenance | |

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| *Accessibility: Keyboard Navigation Bowerman - Chapter 01 #27 Difficulty: Medium Learning Objective: 01-05 Identify the first four levels of measurement* |

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| 28. | Which one of the following sampling methods would generally lead to the least reliable statistical inferences about the population from which the sample has been selected?       |  |  | | --- | --- | | A. | A random sample selected without replacement. |  |  |  | | --- | --- | | B. | A random sample selected with replacement. |  |  |  | | --- | --- | | **C.** | A voluntary response sample. |  |  |  | | --- | --- | | D. | A systematic sample. |  |  |  | | --- | --- | | E. | A stratified random sample. | |

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| *Accessibility: Keyboard Navigation Bowerman - Chapter 01 #28 Difficulty: Medium Gradable: manual Learning Objective: 01-02 Define the term random sample* |

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| 29. | A(n) \_\_\_\_\_ variable is a qualitative variable such that there is no meaningful ordering or ranking of the categories.      |  |  | | --- | --- | | A. | ratio |  |  |  | | --- | --- | | B. | ordinal |  |  |  | | --- | --- | | **C.** | nominative |  |  |  | | --- | --- | | D. | interval |  |  |  | | --- | --- | | E. | random | |

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| *Accessibility: Keyboard Navigation Bowerman - Chapter 01 #29 Difficulty: Easy Learning Objective: 01-05 Identify the first four levels of measurement* |

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| 30. | A person's telephone area code is an example of a(n) \_\_\_\_\_\_\_\_\_\_\_\_\_ variable.      |  |  | | --- | --- | | **A.** | nominative |  |  |  | | --- | --- | | B. | ordinal |  |  |  | | --- | --- | | C. | interval |  |  |  | | --- | --- | | D. | ratio |  |  |  | | --- | --- | | E. | independent | |

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| *Accessibility: Keyboard Navigation Bowerman - Chapter 01 #30 Difficulty: Medium Learning Objective: 01-05 Identify the first four levels of measurement* |

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| 31. | Any characteristic of a population unit is a(n):      |  |  | | --- | --- | | A. | measurement |  |  |  | | --- | --- | | B. | sample |  |  |  | | --- | --- | | C. | observation |  |  |  | | --- | --- | | **D.** | variable |  |  |  | | --- | --- | | E. | trait | |

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| *Accessibility: Keyboard Navigation Bowerman - Chapter 01 #31 Difficulty: Medium Learning Objective: 01-01 Explain the function of research samples* |

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| 32. | A list of all of the units in a population is called a \_\_\_\_\_.      |  |  | | --- | --- | | A. | census |  |  |  | | --- | --- | | **B.** | frame |  |  |  | | --- | --- | | C. | random sample |  |  |  | | --- | --- | | D. | variable |  |  |  | | --- | --- | | E. | systematic sample | |

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| *Accessibility: Keyboard Navigation Bowerman - Chapter 01 #32 Difficulty: Medium Learning Objective: 01-01 Explain the function of research samples* |

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| 33. | The two levels of measurement for qualitative variables are      |  |  | | --- | --- | | A. | ordinal and ratio. |  |  |  | | --- | --- | | B. | interval and ordinal. |  |  |  | | --- | --- | | **C.** | nominative and ordinal. |  |  |  | | --- | --- | | D. | interval and ratio. |  |  |  | | --- | --- | | E. | nominative and interval. | |

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| *Accessibility: Keyboard Navigation Bowerman - Chapter 01 #33 Difficulty: Medium Learning Objective: 01-05 Identify the first four levels of measurement* |

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| 34. | Each customer in a market research study is asked to identify their favourite beverage. The level of measurement for this study would be at the \_\_\_\_\_ level.      |  |  | | --- | --- | | **A.** | nominal |  |  |  | | --- | --- | | B. | ordinal |  |  |  | | --- | --- | | C. | interval |  |  |  | | --- | --- | | D. | ratio |  |  |  | | --- | --- | | E. | quantitative | |

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| *Accessibility: Keyboard Navigation Bowerman - Chapter 01 #34 Difficulty: Medium Learning Objective: 01-05 Identify the first four levels of measurement* |

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| 35. | In sampling from the population, a \_\_\_\_\_ is a unique group representing a segment of the population of interest and which has been predetermined by the researcher.      |  |  | | --- | --- | | A. | focus group |  |  |  | | --- | --- | | B. | system |  |  |  | | --- | --- | | C. | parliament |  |  |  | | --- | --- | | D. | response |  |  |  | | --- | --- | | **E.** | stratum | |

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| *Accessibility: Keyboard Navigation Bowerman - Chapter 01 #35 Difficulty: Medium Learning Objective: 01-02 Define the term random sample* |

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| 36. | When a researcher uses a(n) \_\_\_\_\_ sample, they decrease bias in the sample.      |  |  | | --- | --- | | A. | voluntary response |  |  |  | | --- | --- | | B. | small |  |  |  | | --- | --- | | C. | expensive |  |  |  | | --- | --- | | **D.** | random |  |  |  | | --- | --- | | E. | convenience | |

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| *Accessibility: Keyboard Navigation Bowerman - Chapter 01 #36 Difficulty: Medium Learning Objective: 01-02 Define the term random sample* |

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| 37. | A researcher believes a person's gender will influence their answer to a particular question. In order to take this into account, the researcher selects a random sample of 100 men and another random sample of 100 women. This is an example of a \_\_\_\_\_\_ sample.      |  |  | | --- | --- | | **A.** | stratified random |  |  |  | | --- | --- | | B. | simple random |  |  |  | | --- | --- | | C. | biased |  |  |  | | --- | --- | | D. | multistage cluster |  |  |  | | --- | --- | | E. | systematic | |

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| *Accessibility: Keyboard Navigation Bowerman - Chapter 01 #37 Difficulty: Hard Learning Objective: 01-04 Describe how a process is sampled* |

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| 38. | A \_\_\_\_\_ plot is a graph of individual process measurements versus time.       |  |  | | --- | --- | | A. | line |  |  |  | | --- | --- | | **B.** | runs |  |  |  | | --- | --- | | C. | scatter |  |  |  | | --- | --- | | D. | pie-chart |  |  |  | | --- | --- | | E. | stem | |

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| *Accessibility: Keyboard Navigation Bowerman - Chapter 01 #38 Difficulty: Easy Learning Objective: 01-04 Describe how a process is sampled* |

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| 39. | A machine produces pencils. At the start of the day, the potential number of pencils produced is \_\_\_\_\_. At the end of the day, the actual number of pencils produced is \_\_\_\_\_.      |  |  | | --- | --- | | A. | finite, infinite |  |  |  | | --- | --- | | B. | actual, probable |  |  |  | | --- | --- | | **C.** | infinite, finite |  |  |  | | --- | --- | | D. | staged, actual |  |  |  | | --- | --- | | E. | controlled, measured | |

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| *Accessibility: Keyboard Navigation Bowerman - Chapter 01 #39 Difficulty: Medium Learning Objective: 01-04 Describe how a process is sampled* |

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| 40. | If a process does not exhibit any unusual process variations, then the process is said to be in \_\_\_\_\_\_\_\_\_.    **statistical control** |

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| *Bowerman - Chapter 01 #40 Difficulty: Medium Learning Objective: 01-04 Describe how a process is sampled* |

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| 41. | Any characteristic of a population unit is called a \_\_\_\_\_.    **variable** |

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| *Bowerman - Chapter 01 #41 Difficulty: Medium Learning Objective: 01-01 Explain the function of research samples* |

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| 42. | If a process is in statistical control, then the runs plot for the process will exhibit a(n) \_\_\_\_\_\_\_ amount of variation around a constant, or horizontal, level.    **constant** |

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| *Bowerman - Chapter 01 #42 Difficulty: Medium Learning Objective: 01-04 Describe how a process is sampled* |

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| 43. | A \_\_\_\_\_ is an examination of all the population measurements.    **census** |

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| *Bowerman - Chapter 01 #43 Difficulty: Easy Learning Objective: 01-01 Explain the function of research samples* |

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| 44. | When a population unit selected as part of the sample cannot be contacted or refuses to participate, then we say that \_\_\_\_\_\_\_\_\_ has occurred.    **nonresponse** |

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| *Bowerman - Chapter 01 #44 Difficulty: Easy Learning Objective: 01-06 List some of the potential problems associated with surveys* |

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| 45. | A \_\_\_\_\_ is a list of all the units in a population.    **frame** |

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| *Bowerman - Chapter 01 #45 Difficulty: Medium Learning Objective: 01-03 Explain how a random sample can be generated* |

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| 46. | The process of assigning a value of a variable to each unit in a population or sample is called \_\_\_\_\_.    **measurement** |

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| *Bowerman - Chapter 01 #46 Difficulty: Medium Learning Objective: 01-01 Explain the function of research samples* |

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| 47. | A \_\_\_\_ is a graph of individual process measurements versus time.    **runs plot** |

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| *Bowerman - Chapter 01 #47 Difficulty: Easy Learning Objective: 01-04 Describe how a process is sampled* |

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| 48. | Statistical \_\_\_\_\_ refers to using a sample of measurements to make generalizations about the important aspects of a population.    **inference** |

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| *Bowerman - Chapter 01 #48 Difficulty: Easy Learning Objective: 01-01 Explain the function of research samples* |

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| 49. | A \_\_\_\_\_ is a subset of the units in a population.    **sample** |

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| *Bowerman - Chapter 01 #49 Difficulty: Easy Learning Objective: 01-01 Explain the function of research samples* |

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| 50. | A \_\_\_\_\_ variable can have values that are numbers on the real number line.    **quantitative** |

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| *Bowerman - Chapter 01 #50 Difficulty: Medium Learning Objective: 01-05 Identify the first four levels of measurement* |

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| 51. | A sequence of operations that takes inputs and turns them into outputs is a \_\_\_\_\_.    **process** |

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| *Bowerman - Chapter 01 #51 Difficulty: Medium Learning Objective: 01-04 Describe how a process is sampled* |

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| 52. | A \_\_\_\_\_\_\_\_\_ variable records into which of several categories a population unit falls.    **qualitative** |

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| *Bowerman - Chapter 01 #52 Difficulty: Medium Learning Objective: 01-05 Identify the first four levels of measurement* |

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| 53. | A set of units we wish to study is called a \_\_\_\_\_.    **population** |

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| *Bowerman - Chapter 01 #53 Difficulty: Medium Learning Objective: 01-01 Explain the function of research samples* |

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| 54. | \_\_\_\_\_ is the science of describing the important aspects of a set of measurements.    **Descriptive statistics** |

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| *Bowerman - Chapter 01 #54 Difficulty: Medium Learning Objective: 01-01 Explain the function of research samples* |

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| 55. | In situations when it is not possible to number all of the units in a population, we often use a \_\_\_\_\_ sample to approximate a random sample.    **systematic** |

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| *Bowerman - Chapter 01 #55 Difficulty: Medium Learning Objective: 01-02 Define the term random sample* |

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| 56. | A runs plot with an increasing trend would indicate that the corresponding process is \_\_\_\_\_.    **out of control** |

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| *Bowerman - Chapter 01 #56 Difficulty: Medium Learning Objective: 01-04 Describe how a process is sampled* |

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| 57. | If a unit is placed back into the population after being selected for a sample, we are sampling \_\_\_\_\_ replacement.    **with** |

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| *Bowerman - Chapter 01 #57 Difficulty: Medium Learning Objective: 01-02 Define the term random sample* |

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| 58. | A \_\_\_\_\_ table is used to help select items for a random sample.    **random number** |

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| *Bowerman - Chapter 01 #58 Difficulty: Easy Learning Objective: 01-03 Explain how a random sample can be generated* |

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| 59. | A process that is in statistical control does not necessarily imply that the process is \_\_\_\_\_\_\_\_\_\_ of meeting the customer requirements.    **capable** |

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| *Bowerman - Chapter 01 #59 Difficulty: Hard Learning Objective: 01-04 Describe how a process is sampled* |

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| 60. | A consumer's yes/no reply to a survey question is what type of variable?     qualitative |

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| *Bowerman - Chapter 01 #60 Difficulty: Medium Learning Objective: 01-05 Identify the first four levels of measurement* |

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| 61. | The change in daily price of a stock is what type of variable?     quantitative |

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| *Bowerman - Chapter 01 #61 Difficulty: Medium Learning Objective: 01-05 Identify the first four levels of measurement* |

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| 62. | List two types of random sampling methods.     Any two of the following: simple random sampling, stratified random sampling, multistage cluster sampling, and systematic sampling. |

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| *Bowerman - Chapter 01 #62 Difficulty: Medium Gradable: manual Learning Objective: 01-06 List some of the potential problems associated with surveys* |

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| 63. | In a voluntary response sample, what types of opinions are usually expressed?     Strong/negative. |

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| *Bowerman - Chapter 01 #63 Difficulty: Hard Learning Objective: 01-06 List some of the potential problems associated with surveys* |

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| 64. | Describe one weakness and one advantage to mailed surveys.     Advantages: inexpensive, unobtrusive. Disadvantages: low response rate, uncertain person meant to complete survey was actually the one who completed it, uncertain person fully understood questions. |

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| *Bowerman - Chapter 01 #64 Difficulty: Hard Gradable: manual Learning Objective: 01-06 List some of the potential problems associated with surveys* |

Chapter 1 Summary

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| *Category* | *# of Questions* |
| Accessibility: Keyboard Navigation | 39 |
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| Difficulty: Hard | 6 |
| Difficulty: Medium | 40 |
| Gradable: manual | 4 |
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| Learning Objective: 01-02 Define the term random sample | 8 |
| Learning Objective: 01-03 Explain how a random sample can be generated | 4 |
| Learning Objective: 01-04 Describe how a process is sampled | 12 |
| Learning Objective: 01-05 Identify the first four levels of measurement | 20 |
| Learning Objective: 01-06 List some of the potential problems associated with surveys | 6 |