Lesson 2: The Statistical Process & Design of Studies

Preparation

## Solutions

**Please note that the steps show rounded numbers, but that the final answers to the problems are calculated without rounding.**

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| Problem | Part | Solution |
| 1 | A | Design the Study - State a research question, what needs to be done to answer the research question. What is the population? What kind of data needs to be collected? |
| 1 | B | Collect Data - How is the sample collected, and going out to actually obtain the data? |
| 1 | C | Describe the Data - Creating graphs or calculating statistics to help visualize and describe the data. |
| 1 | D | Make Inferences - Using the information contained in a sample to draw conclusions about a population. |
| 1 | E | Take Action - Determine which action to take based on the results of the study. |
| 2 | A | c- Simple Random Sample (SRS) |
| 2 | B | a - Stratified Sampling |
| 2 | C | b - Systematic Sampling |
| 2 | D | d - Cluster Sampling |
| 3 | - | Experiment - Researchers control the conditions under which measurements are made.  Observational Study - Researchers simply observe what happens without controlling the conditions under which measurements are made.  Treatment - The new or experimental condition that is imposed on the subjects.  Response Variable - The variable that changes or responds to the treatment.  Subjects - Participants in a study |
| 4 | - | The Null Hypothesis () is the foundational assumption about the population, the ‘status quo’  The Alternative Hypothesis () is the statement of what is true if the null hypothesis is rejected. It is also a statement about the population. |
| 5 | - | P-Value: The probability that a result will be observed that is as extreme or more extreme than the information observed, assuming that that the null hypothesis is true. |
| 6 | A | Convenience Sampling |
| 6 | B | Systematic Sampling |
| 6 | C | Simple Random Sampling |
| 6 | D | Stratified Sampling |
| 6 | E | Cluster Sampling |
| 7 | A | Cluster Sampling |
| 7 | B | Simple Random Sampling |
| 7 | C | Stratified Sampling |
| 7 | D | Systematic Sampling |
| 8 | A | Observational Study |
| 8 | B | Experimental Design  Response Variable - Hours of sleep they get in a week  Treatment - Sleepeze or placebo  Subjects - 1,000 insomnia patients |
| 9 | A | Designed Experiment |
| 9 | B | 224 patients diagnosed with skin irritations |
| 9 | C | The degree of skin irritations observed in the patients |
| 9 | D | 0.5% cream, 1% cream, and placebo |