

Questions on Topic Six: Overview of Methods of Data Collection

Multiple-Choice Questions

Directions: The questions or incomplete statements that follow are each followed by five suggested answers or completions. Choose the response that best answers the question or completes the statement.

1. When travelers change airlines during connecting flights, each airline receives a portion of the fare. Several years ago, the major airlines used a sample trial period to determine what percentage of certain fares each should collect. Using these statistical results to determine fare splits, the airlines now claim huge savings over previous clerical costs. Which of the following is true?
 - I. The airlines ran an experiment using a trial period for the control group.
 - II. The airlines ran an observational study using the calculations from a trial period as a sample.
 - III. The airlines feel that any monetary error in fare splitting resulting from using a statistical sample is smaller than the previous clerical costs necessary to calculate exact fare splits.

(A) I only
(B) II only
(C) III only
(D) I and III
(E) II and III
2. Which of the following are true statements?
 - I. In an experiment some treatment is intentionally forced on one group to note the response.
 - II. In an observational study information is gathered on an already existing situation.
 - III. Sample surveys are observational studies, not experiments.

(A) I and II
(B) I and III
(C) II and III
(D) I, II, and III
(E) None of the above gives the complete set of true responses.

3. Which of the following are true statements?

- I. In an experiment researchers decide how people are placed in different groups.
- II. In an observational study, the participants select which group they are in.
- III. A control group is most often a self-selected grouping in an experiment.

- (A) I and II
- (B) I and III
- (C) II and III
- (D) I, II, and III
- (E) None of the above gives the complete set of true responses.

4. In one study on the effect of niacin on cholesterol level, 100 subjects who acknowledged being long-time niacin takers had their cholesterol levels compared with those of 100 people who had never taken niacin. In a second study, 50 subjects were randomly chosen to receive niacin and 50 were chosen to receive a placebo.

- (A) The first study was a controlled experiment, while the second was an observational study.
- (B) The first study was an observational study, while the second was a controlled experiment.
- (C) Both studies were controlled experiments.
- (D) Both studies were observational studies.
- (E) Each study was part controlled experiment and part observational study.

5. In one study subjects were randomly given either 500 or 1000 milligrams of vitamin C daily, and the number of colds they came down with during a winter season was noted. In a second study people responded to a questionnaire asking about the average number of hours they sleep per night and the number of colds they came down with during a winter season.

- (A) The first study was an experiment without a control group, while the second was an observational study.
- (B) The first study was an observational study, while the second was a controlled experiment.
- (C) Both studies were controlled experiments.
- (D) Both studies were observational studies.
- (E) None of the above is a correct statement.

6. In a 1992 London study, 12 out of 20 migraine sufferers were given chocolate whose flavor was masked by peppermint, while the remaining eight sufferers received a similar-looking, similar-tasting tablet that had no chocolate. Within 1 day, five of those receiving chocolate complained of migraines, while no complaints were made by any of those who did not receive chocolate. Which of the following is a true statement?
- (A) This study was an observational study of 20 migraine sufferers in which it was noted how many came down with migraines after eating chocolate.
 - (B) This study was a sample survey in which 12 out of 20 migraine sufferers were picked to receive peppermint-flavored chocolate.
 - (C) A census of 20 migraine sufferers was taken, noting how many were given chocolate and how many developed migraines.
 - (D) A study was performed using chocolate as a placebo to study one cause of migraines.
 - (E) An experiment was performed comparing a treatment group that was given chocolate to a control group that was not.
7. Suppose you wish to compare the average class size of mathematics classes to the average class size of English classes in your high school. Which is the most appropriate technique for gathering the needed data?
- (A) Census
 - (B) Sample survey
 - (C) Experiment
 - (D) Observational study
 - (E) None of these methods is appropriate.
8. Which of the following are true statements?
- I. Based on careful use of control groups, experiments can often indicate cause-and-effect relationships.
 - II. While observational studies may suggest relationships, great care must be taken in concluding that there is cause and effect because of the lack of control over lurking variables.
 - III. A complete census is the only way to establish a cause-and-effect relationship absolutely.
- (A) I and II
 - (B) I and III
 - (C) II and III
 - (D) I, II, and III
 - (E) None of the above gives the complete set of true responses.

9. Two studies are run to compare the experiences of families living in high-rise public housing to those of families living in townhouse subsidized rentals. The first study interviews 25 families who have been in each government program for at least 1 year, while the second randomly assigns 25 families to each program and interviews them after 1 year. Which of the following is a true statement?
- (A) Both studies are observational studies because of the time period involved.
 - (B) Both studies are observational studies because there are no control groups.
 - (C) The first study is an observational study, while the second is an experiment.
 - (D) The first study is an experiment, while the second is an observational study.
 - (E) Both studies are experiments.
10. Two studies are run to determine the effect of low levels of wine consumption on cholesterol level. The first study measures the cholesterol levels of 100 volunteers who have not consumed alcohol in the past year and compares these values with their cholesterol levels after 1 year, during which time each volunteer drinks one glass of wine daily. The second study measures the cholesterol levels of 100 volunteers who have not consumed alcohol in the past year, randomly picks half the group to drink one glass of wine daily for a year while the others drink no alcohol for the year, and finally measures their levels again. Which of the following is a true statement?
- (A) The first study is an observational study, while the second is an experiment.
 - (B) The first study is an experiment, while the second is an observational study.
 - (C) Both studies are observational studies, but only one uses both randomization and a control group.
 - (D) The first study is a census of 100 volunteers, while the second study is an experiment.
 - (E) Both studies are experiments.

Answer Key

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| 1. E | 3. A | 5. A | 7. A | 9. C |
| 2. D | 4. B | 6. E | 8. A | 10. E |

Answers Explained

1. (E) This study is not an experiment in which responses are being compared. It is an observational study in which the airlines use split fare calculations from a trial period as a sample to indicate the pattern of all split fare transactions. They claim that this leads to "huge savings."