Name_____

The Data Analysis Process and Collecting Data Sensibly Lightning Round

1. A survey is to be undertaken of recent nursing graduates in order to compare the starting salaries of women and men. For each graduate, three variables are to be recorded (among others) - Gender, starting salary, and area of specialization.

(a) Gender and starting salary are explanatory variables; area of specialization is a response variable.
(b) Gender is an explanatory variable; starting salary and area of specialization are response variables.
(c) Gender is an explanatory variable; starting salary is a response variable; area of specialization is a possible confounding variable.
(d) Gender is a response variable; starting salary is an explanatory variable; area of specialization is a possible confounding variable.
(e) Gender and area of specialization are response variables; starting salary is an explanatory variable.

2. Some researchers believe that too much iron in the blood can raise the level of cholesterol. The iron level in the blood can be lowered by making periodic blood donations. A study is performed by randomly selecting half of a group of volunteers to give periodic blood donations while the rest do not. Is this an experiment or an observational study?

(a) An experiment with control group and blinding
(b) An experiment with blocking
(c) An observational study with comparison and randomization
(d) An observational study with little if any bias
(e) None of the above

3. Consider an experiment to investigate the efficacy of different insecticides in controlling pests and their effects on subsequent yield. What is the best reason for randomly assigning treatment levels (spraying or not spraying) to the experimental units (farms)?

(a) Randomization make the experiment easier to conduct because we can apply the insecticide in any pattern rather than in a systematic fashion.
(b) Randomization makes the analysis easier because the data can be collected and entered into the computer in any order.
(c) Randomization is required by statistical consultants before they will help you analyze the experiment.
(d) Randomization implies that it is not necessary to be careful during the experiment, during data collection, and during data analysis.
(e) Randomization will tend to average out all other uncontrolled factors such as soil fertility so that they are not confounded with the treatment effects.

4. Which of the following are true about the design of matched-pairs experiments?

I. Each subject might receive both treatments.
II. Each pair of subjects receives the identical treatment, and differences in their responses are noted.
III. Blocking is one form of matched-pair design.

(a) I only
(b) II only
(c) III only
(d) I and III
(e) II and III

5. A consumer product agency tests miles per gallon for a sample of automobiles using each of four different octanes of gasoline. Which of the following is true?

(a) There are four explanatory variables and one response variable.
(b) There is one explanatory variable with four levels of response.
(c) Miles per gallon is the only explanatory variable, but there are four response variables corresponding to the different octanes.
(d) There are four levels of a single explanatory variable.
(e) Each explanatory variable has an associated level of response.

6. A survey was conducted by visiting a student parking lot to estimate the proportion of cars that were red. Which of the following is NOT correct?

(a) If the sampled stall was empty, we can simply choose another stall, at random, to take its place because it is not likely that the stall being vacant is related to a car being red.
(b) The sample would be representative of the population if 100 cars were chosen regardless if randomization was used or not.
(c) Even though a random sample was taken from cars in the parking lot, the sample may not be representative of the cars driven by students because the decision to park in that particular lot is self-selected.
(d) If a another sample of cars was chosen, it is likely that a different proportion of cars that are red would be obtained.