

Name : _____

Directions: This exam contains seven problems worth a total of 100 points. For each computational problem, you must first write the formula to be used and present all your subsequent work in order to receive full or partial credit. Circle your final answers.

1. For each of the following variables, determine whether the variable is categorical or quantitative. For quantitative variables, further determine whether they are discrete or continuous. (4 pts. ea.)

(a) Length of a lizard (in millimeters) _____

(b) Breed of a cattle _____

(c) Quality of education (excellent, satisfactory, poor) _____

(d) Number of days in a year (in days) _____

2. Fred sold his truck for \$3,400. Trucks like his have an average trade value of \$3,000 with a standard deviation of \$250. George sold his minivan for \$2,800. Minivans like his are traded at an average of \$2,500 with a standard deviation of \$180.

(a) Relatively speaking, which person got the better deal, Fred or George? Justify your answer. (8 pts.)

(b) Henry claims that he sold his truck, which was like Fred's, for \$5,000. Should you believe Henry? Explain. (8 pts.)

3. Briefly, but clearly, describe an example of a study in which there is a potential response bias. (6 pts.)

4. Consider the following data on simple reaction time (in seconds) for seven people.

$$X: \{0.72, 0.64, 0.83, 1.05, 0.51, 0.97, 0.76\}$$

(a) Compute the sample median. (6 pts.)

(b) Compute the sample mean and the sample standard deviation. (10 pts.)

(c) What do the relative locations of the sample mean and median tell you about the skewness of the distribution? (6 pts.)

5. Refer to the data for Problem 4. Construct a stem-and-leaf plot using a stem width of 0.1. (8 pts.)

6. For the distribution of the ages of college students, the three quartile points are found to be $Q1 = 19.2$, $Q2 = 20.1$, and $Q3 = 21.3$.

(a) Find the interquartile range. (6 pts.)

(b) For the following values of age, identify a potential outlier(s). Justify your answer. (8 pts.)

$\{20, 21, 18, 25, 20, 17\}$

7. A study was conducted to investigate how the rising health-insurance cost was affecting people's lives. A random sample of 500 people, who were between the ages of 40 and 50, was selected and a survey was conducted by phone. Of the 500 people selected, 43% participated in the survey. One of the major findings of the study was that, of those who participated in the survey, 62% had experienced significant increases in insurance premium within the last six months.

(a) How many people actually participated in the survey? Compute the margin of error for the percentage of the people who had experienced increases in premium. (6 pts.)

(b) What extraneous variable has been identified in the study and how has it been dealt with? (6 pts.)

(c) What potential bias is in the study? Note: There may be multiple biases, but one is clearly most obvious and serious. (6 pts.)