

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. Consider the following data presented in a stem-and-leaf display. The stem-and-leaf display is constructed so that the stem width is 1.

Stem	Leaf
0	256
1	049
2	1488
3	447
4	7
5	3
6	
7	6

- (a) Find the minimum value and the maximum value in the data. (8 pts.)
  - (b) Find the median of the data. (6 pts.)
  - (c) Comment on the skewness of the distribution of the data. (6 pts.)
2. Briefly, but clearly, describe an example of a study in which there is a potential non-response bias. (8 pts.)

3. Below are descriptions of four data sets. For each, determine whether the data are categorical or numerical. (4 pts. ea.)

(a) Sizes of eight cars (compact, mid-size, full-size) ..... \_\_\_\_\_

(b) Amounts of beer served in five glasses ..... \_\_\_\_\_

(c) Precipitations (in inches) for three cities ..... \_\_\_\_\_

(d) Colors of nine pairs of socks ..... \_\_\_\_\_

4. In a study to investigate the efficacy of biofeedback in reducing blood pressures, a total of 48 volunteers with chronic hypertension signed up for participation. The researcher placed the first 24 participants on the sign-up sheet into the experimental group and the last 24 into the control group. After three weeks of the corresponding treatments, the results suggested some reduction in blood pressures for the experimental participants. What is the major shortcoming of this study? (8 pts.)

5. Featured below are scores on a pop-quiz (20 pts. max.) in a chemistry class.

$$X: \{10, 18, 19, 17, 14, 17, 13\}$$

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

(b) Compute the sample mean and the sample standard deviation. Show your work. (18 pts.)

6. In a physics course, the mean score for the midterm exam was 73 and the standard deviation was 8.

(a) Kevin, who was enrolled in the course, got a 79 on the midterm exam. Compute the  $z$ -score for his midterm score. (6 pts.)

(b) One student got a  $z$ -score of  $-0.50$ . What was his or her original midterm score? (6 pts.)

7. For this problem, no substantial computation is necessary. Consider the following data set.

$$Y: \{3, 8, 1, 7, 5, 7, 6\}$$

Take as given that the sample mean for the data is  $\bar{y} = 5.286$  and the sample standard deviation is  $s = 2.498$ .

(a) Suppose that you multiply each data value in  $Y$  by 2. What will the resulting sample mean be? Give a specific value. (6 pts.)

(b) Suppose that you subtract 3 from each data value in  $Y$ . What will the resulting sample standard deviation be? Give a specific value. (6 pts.)