

Name:

Chapters 1 – 3 100 points

Score

Part I: Write the word or phrase that best completes each statement or answers the question (20 points)

A *Newsweek* poll of a sample of Americans revealed that “84% of those surveyed would choose organically grown produce over produce grown using chemical fertilizers, pesticides, and herbicides.”

1. Is the statement in quotes an inferential or a descriptive statement?

2. Based on the same information, what if the statement the statement had been “84% of Americans would choose organically grown produce over produce grown using chemical fertilizers, pesticides, and herbicides.” Is the statement in quotes an inferential or a descriptive statement?

3. The five top Oklahoma State Officials are Governor (G), Lieutenant Governor (L), Secretary of State (S), Attorney General (A), Treasurer (T). The 10 possible samples (without replacement) of size 3 that can be obtained from the population of five officials are

4. Observational studies can reveal only association, whereas designed experiments can help establish

5. Each year, *Fortune Magazine* publishes an article titled “The International 500” that provides a ranking by sales of the top 500 firms outside the United States. Use systematic random sampling and the table of random numbers (line 04) to obtain a sample of 10 firms from *Fortune Magazine’s* list of International 500”

Answer.....

6. Storage of perishable items is an important concern for many companies. One study examined the effect of storage time and storage temperature on the deterioration of a particular item. Three different storage temperatures and five different storage times were used. Identify the following.

Experimental units.....

Dependent variable.....

Independent variables.....

Treatments.....

7. Use the following variables: Height, Number of siblings, and Political affiliation to fill in the blank.

The quantitative variables are

The qualitative variable is

The discrete variable is

The continuous variable is.....

PART II: Answer true or false (20 points)

According to Professor Sidney S. Culbelt of the University of Washington, the principal languages of the world in 1998 were as follows.

| Rank | Language | Speakers (millions) |
|------|----------|---------------------|
| 1 | Mandarin | 1052 |
| 2 | English | 508 |
| 3 | Hindi | 487 |
| 4 | Spanish | 417 |
| 5 | Russian | 277 |
| 6 | Arabic | 246 |
| 7 | Bengali | 211 |

8. The type of data presented in the first column of the table is quantitative and discrete.

9. The type of data provided by the information that Sally Ride speaks Spanish is qualitative.

10. The type of data provided by the information in the third column of the table is quantitative and discrete.
11. The quantity σ is a parameter.
12. A standardized variable always has standard deviation 1 and mean 0.
13. For the distribution that is skewed to the right, the mean is somewhat larger than the median.
14. For the data 35, 24, 46, 77, 111, 103, 255, 903, 777, the value of Q3 is 516.
15. For the data 35, 24, 46, 77, 111, 103, 255, 903, 777, the value of the IQR is 475.5.
16. The 50th percentile is the same as Q2.
17. In a histogram, the areas of the bars represent either counts or proportions of the observations.
18. The deciles the 10th, 20th, 30th, 40th, 50th, 60th, 70th, 80th, and the 90th percentiles.

PART III: Circle the letter that corresponds to the right answer (20points)

19. The following are data on the number of people per household for a sample of 40 households.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2 | 5 | 2 | 1 | 1 | 2 | 3 | 4 |
| 1 | 4 | 4 | 2 | 1 | 4 | 3 | 3 |
| 7 | 1 | 2 | 2 | 3 | 4 | 2 | 2 |
| 6 | 5 | 2 | 5 | 1 | 3 | 2 | 5 |
| 2 | 1 | 3 | 3 | 2 | 2 | 3 | 3 |

To construct a frequency and relative frequency distributions for the above data, it is most appropriate to use

- A. Descriptive statistics
 - B. Inferential statistics
 - C. Classes based on a single value
 - D. Classes based on grouping
20. To construct a relative-frequency histogram
- A. Classes are on the horizontal axis and frequencies of classes are on the vertical axis
 - B. Classes are on the horizontal axis and relative frequencies of classes are on the vertical axis
 - C. Relative frequencies are on the horizontal axis and classes are on the vertical axis
 - D. All of the above

21. The following table presents frequency and relative- frequency distributions for top television programs by rating as of May 1998.

| Network | Frequency | Relative Frequency |
|---------|-----------|--------------------|
| CBS | 8 | 0.40 |
| ABC | 5 | 0.25 |
| NBC | 7 | 0.35 |

To display the above information graphically, it is appropriate to use

- A. Only the pie chart for the relative-frequencies
- B. Only the bar chart for the relative-frequencies
- C. Both A and B
- D. A relative frequency histogram

22. Following are data based on the results of the study for the heart rates, in beats per minute, of the control drivers of a stressed study.

| | | | | | | | |
|----|----|----|----|----|----|----|----|
| 74 | 52 | 67 | 63 | 77 | 57 | 80 | 77 |
| 53 | 76 | 54 | 73 | 54 | 60 | 77 | 63 |
| 60 | 68 | 64 | 66 | 71 | 66 | 55 | 71 |
| 84 | 63 | 73 | 59 | 68 | 64 | 82 | |

For the given data, which graphical display is generally preferable

- A. A stem-and-leaf diagram
- B. A pie chart
- C. A histogram
- D. A bar chart

For Numbers 23 and 24: Suppose that we want to compare the driving distances for five different brands of golf ball for 40 golfers.

23. We would randomly divide the 40 golfers into five groups of 8 golfers each and then randomly assign each group to randomly drive a different brand of ball.

- A. This is randomized block design for golf ball experiment
- B. This completely randomized design for golf ball experiment.
- C. This is a systematic design for golf ball experiment
- D. None of the above

24. We could divide 40 golfers, say 20 men and 20 women. We would randomly divide the 20 golfers into five groups of 4 men each and randomly assign each group of men to drive a different brand of ball. Likewise we would randomly divide the 20 women into five groups of 4 women each and then randomly assign each group of women to drive a different brand of ball.

- A. This is randomized block design for golf ball experiment.
- B. This is a cluster design for golf ball experiment
- C. This is a stratified design for golf ball experiment
- D. None of the above

25. For the data set: 1 2 3 4 5 6 7 8 9
- A. $\bar{x} = 60$
 - B. $\bar{x} = 45$
 - C. $\bar{x} = 5$
 - D. $\bar{x} = \sqrt{5}$

26. For the data set: 1 2 3 4 5 6 7 8 99
- A. The mean is a better measure than the median
 - B. The median is a better measure than the mean
 - C. The mean is the same as the median
 - D. None of the above

27. For the data set: 1 2 3 4 5 6 7 8 99
The Interquartile Range is
- A. 2.5
 - B. 5
 - C. 7.5
 - D. 99

28. If $x = 5$, $\mu = 3$, and $\sigma = 2$, the z-score is
- A. 2
 - B. 0
 - C. 1.5
 - D. 1

Part IV: (40 points)

Numbers 29 and 30: Following are data based on the results of the study for the heart rates, in beats per minute, of the control drivers of a stressed study.

| | | | | | | | |
|----|----|----|----|----|----|----|----|
| 74 | 52 | 67 | 63 | 77 | 57 | 80 | 77 |
| 53 | 76 | 54 | 73 | 54 | 60 | 77 | 63 |
| 60 | 68 | 64 | 66 | 71 | 66 | 55 | 71 |
| 84 | 63 | 73 | 59 | 68 | 64 | 82 | |

29. Use your calculators to find the five-number summary for the data.

30. Construct

(a) a boxplot for the data

(b) a stem and leaf diagram for the data

31. Match the following words with the corresponding symbols: sample mean, sample standard deviation, parameter, statistic, population mean, and population standard deviation. Hint: Some symbols have more than one answer.

a. \bar{x}

b. σ

c. s

d. μ

32. A pediatrician who tested the cholesterol levels of several young patients was alarmed to find that many had levels higher than 200 mg per 100 mL. Use the graph to answer the following questions. Note that cholesterol levels are always expressed as whole numbers.

- a. What percentage of the patients has cholesterol levels between 205 and 209?
- b. What percentage of the patients has cholesterol levels of 215 or higher?
- c. If the number of patients is 20, how many have levels between 210 and 214?