

The 35 exam questions and answer sheet are both to be turned in to your Discussion Section instructor at the end of the exam. Code your name and ID number on the answer sheet. **Code your Section number under OPTIONAL CODES in positions L M N.** Please notice the Defective Question report page at the end of the exam.

1. Which of the following statistics are resistant to outliers?
 - I. The mean
 - II. The range
 - III. The standard deviation
 - A) I and II only
 - B) I and III only
 - C) II and III only
 - D) I, II, and III
 - E) None of the above.

2. The professor of a statistics course graded her latest exam and found the mean to be 72 and the standard deviation to be 8. She then decided to rescale the scores by adding 5 points to each person's exam. What are the mean and standard deviation of the new scores?
 - A) mean = 72, standard deviation = 8
 - B) mean = 72, standard deviation = 13
 - C) mean = 77, standard deviation = 8
 - D) mean = 77, standard deviation = 13
 - E) Cannot be determined from the information given.

3. A step aerobics class is attended by 5 men and 15 women. The average weight of the men is 170 pounds and the average weight of the women is 130 pounds. What is the average weight of all 20 people (to the nearest lb.)?
 - A) 140 lb.
 - B) 150 lb.
 - C) 160 lb.
 - D) 187 lb.
 - E) Cannot be determined from the information given.

4. If you are interested in predicting future behavior of a meandering process, it would be more helpful to look at a histogram than a sequence plot.
 - A) True
 - B) False

5. A large company has 500 female employees and 850 male employees. The CEO wants to compare the distribution of ages of the females to the males. What graphical displays would be the best for comparison?
- A) frequency histograms
 - B) relative frequency histograms
 - C) side-by-side Pareto Diagrams
 - D) separate sequence plots for males and females
 - E) sequence plots with different plotting symbols for males and females
6. Observational studies are passive studies in which randomization is **not** used.
- A) True B) False
7. A company wants to get feedback from its workers via a questionnaire. The company asks for volunteers (anyone interested) to fill out the questionnaire. The results are then compiled and studied. True or false: This is an example of a probability survey.
- A) True B) False
8. Which of the following data sets is longitudinal?
- I. The heights of patients getting their physicals at the University Hospital on June 12th, 1997.
 - II. Average weekly salaries for McDonalds workers from June 1995 to January 1996.
 - III. The ages of the spectators at the Iowa vs. UNI game this fall.
- A) I and III
 - B) I and II
 - C) I only
 - D) II only
 - E) None of them
9. At the beginning of the semester, a large lecture class had 300 students. One week later, the class had 270 students. What is the percentage change?
- A) -11.11%
 - B) -10.00%
 - C) 10.00%
 - D) 11.11%
 - E) 90.00%

10. Which one of the following statements is true?

- A) A sequence plot is not useful for seeing trends over time.
- B) A designed experiment does not involve randomization.
- C) The mean is always better than the median as a measure of a typical value.
- D) Density histograms are good for displaying the distribution of data with unequal class interval lengths.
- E) None of the above statements are true.

11. Consider the following stem-and-leaf plot.

```
Stem-and-leaf      N = 20
Leaf Unit = 1.0
   0  3
   0  59
   1  1
   1  5
   2  2
   2  557789
   3  0224
   3  5689
```

Based on the above plot, which of the following statements are true?

- I. The median is 27.5.
- II. The data is skewed toward lower values.
- III. The range is 30.

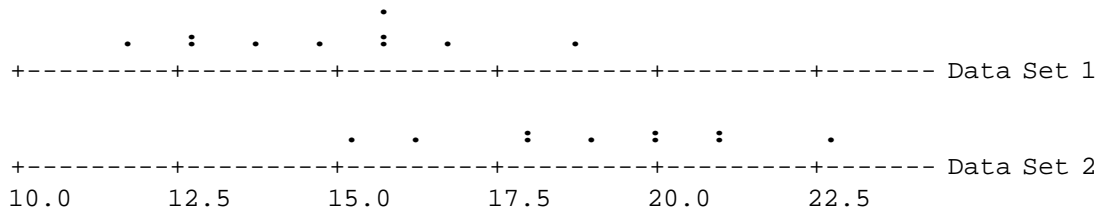
- A) I only
- B) II only
- C) I and II
- D) I and III
- E) I, II, and III

12. What is the standard deviation of the three data values given in the table?

- A) 1
- B) 2
- C) 3
- D) 4
- E) 5

Data		
15		
25		
20		

13. Based on the following dotplots, which one of the following statements is true?



- A) The mean of Data Set 1 is larger than that of Data Set 2.
- B) The median of Data Set 1 is smaller than that of Data Set 2.
- C) The number of points in Data Set 1 is larger than that of Data Set 2.
- D) The median of Data Set 1 is larger than that of Data Set 2.
- E) None of the above are true.

14. The following table displays the number of rugby shirts sold yesterday at the Land's End outlet:

99Size

Gender	Small	Medium	Large	Extra Large	Total
Women	12	9	23	6	50
Men	8	16	35	11	70
Total	20	25	58	17	120

What percentage of women's shirts sold were size small (to the nearest percent)?

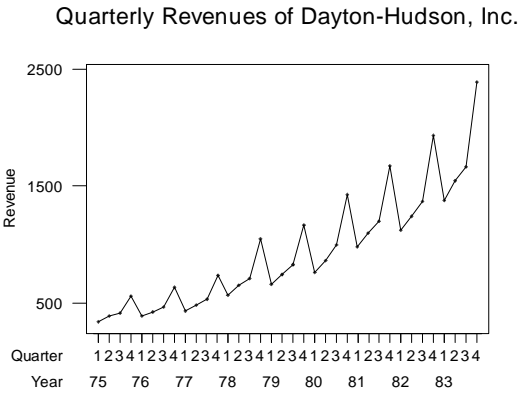
- A) 11%
- B) 17%
- C) 24%
- D) 33%
- E) 46%

15. Referring to the table in the previous question, what percentage of the large shirts sold were men's (to the nearest percent)?

- A) 12%
- B) 29%
- C) 40%
- D) 48%
- E) 60%

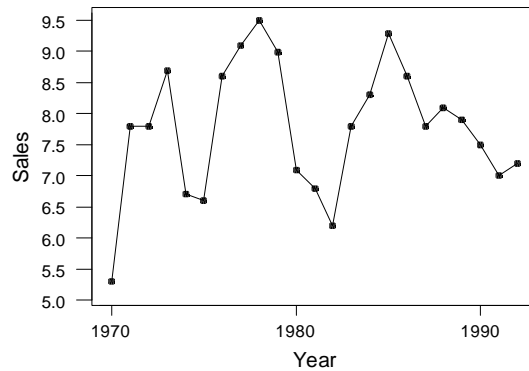
16. A random process is one that is *as if* the successive values are drawn from a well-mixed bowl of possible values each time replacing the value drawn and remixing before selecting the next.
- A) True B) False

17. The sequence plot at the right displays the quarterly revenues for the Dayton-Hudson department stores over several years. It is best described as



- A) random
 B) meandering
 C) upward trend
 D) seasonal
 E) upward trend plus seasonal

18. The sequence plot at the right displays the annual worldwide vehicle sales (in millions) for General Motors over several years. It is best described as



- A) random
 B) meandering
 C) upward trend
 D) seasonal
 E) downward trend

19. The Pareto Diagram is a basic tool for visually separating the “vital few from the trivial many.”

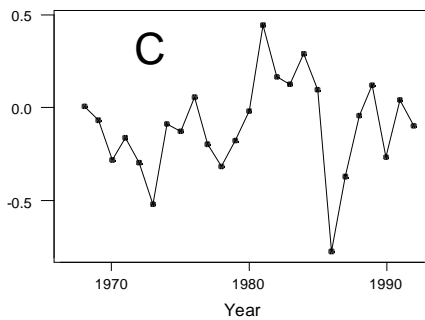
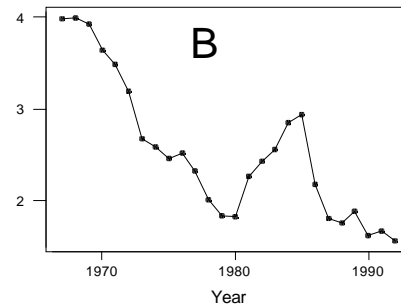
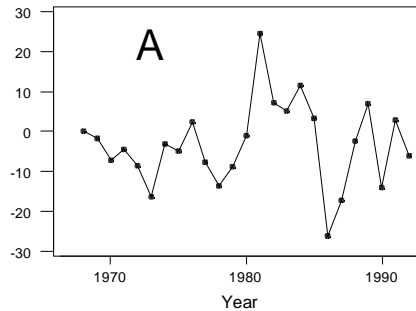
- A) True B) False

20. A dataset contains 36 values with a mean of 10.4 and a standard deviation of 2.2. The third data value is $y_3 = 11.5$. What is the standardized value corresponding to y_3 ?

- A) -0.5
 B) 0
 C) +0.5
 D) 1
 E) None of the above.

21. The three graphs, A, B, and C, at the right and below display sequence plots for the exchange rates of German marks for US dollars, the differences of the sequence, and the percentage changes of the sequence. Match the labels for the plots in the order of: original sequence, differences, and percentage changes.

- A) ABC
- B) BCA
- C) CAB
- D) ACB
- E) BAC



22. If you are interested in predicting future behavior of a random process, it would be more helpful to look at a dotplot than a sequence plot.

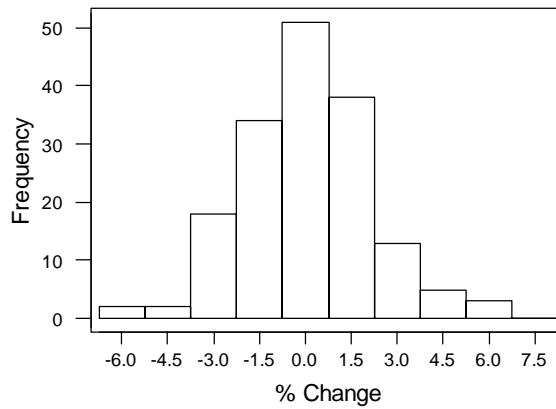
- A) True
- B) False

23. The display at the right shows the Minitab calculator setup to produce a new sequence in a column named %Changes from a Sales sequence. True or false: When OK is pressed this calculation will produce the percentage changes of the Sales sequence.

- A) True
- B) False

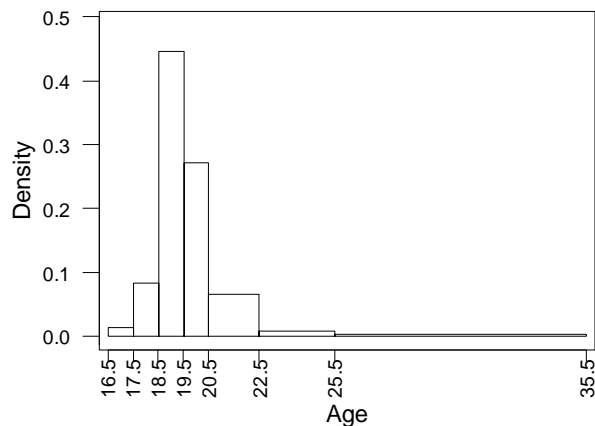


24. The frequency histogram at the right shows the distribution of the percentage changes in the daily stock prices of Chrysler Corp over 167 consecutive trading days. Based on this plot we can say that:



- A) the prices meandered around zero for these 167 days.
- B) the stock prices rose relative to the previous days price about as often as they dropped relative to the previous days price.
- C) the stock price sequence could be described as random.
- D) the stock price sequence contains an upward trend.
- E) the stock price sequence contains a downward trend.

25. The density histogram at the right is of the ages of the students in this class defined as age last birthday in years. There are 345 ages in the dataset. From this plot, which of the following gives the number of 19-year olds in the class?



- A) 45
- B) 29
- C) 154
- D) 345
- E) None of these is close to the correct answer.

26. A dataset contains 29 values with a mean of 123.5 and a standard deviation of 3.7. If all of the data values are doubled what are the new mean and standard deviation?

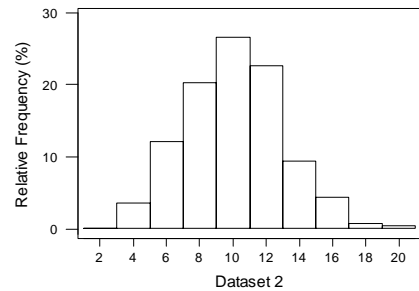
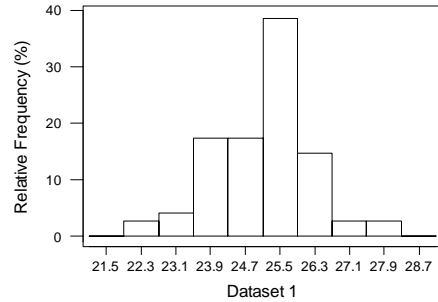
- A) mean = 123.5, standard deviation = 7.4
- B) mean = 247, standard deviation = 3.7
- C) mean = 123.5, standard deviation = 3.7
- D) mean = 247, standard deviation = 7.4
- E) None of the above.

27. Dr. W. Edwards Deming is considered the father of scientific management.

- A) True
- B) False

28. The two relative frequency histograms at the right are based on 75 and 256 data points, respectively. Which one of the following statements is true?

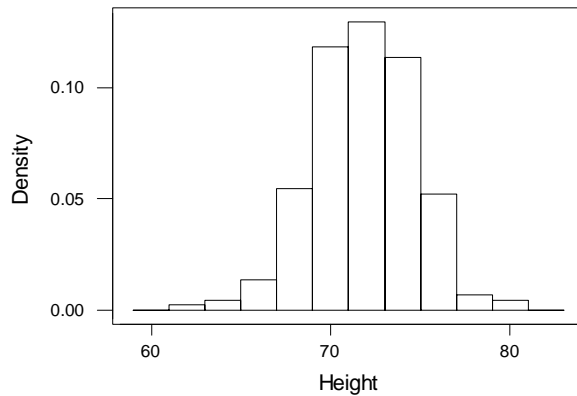
- A) Dataset 1 has larger mean but smaller standard deviation.
- B) Dataset 2 has larger mean but smaller standard deviation.
- C) Dataset 1 has larger mean and larger standard deviation.
- D) Dataset 2 has smaller mean and smaller standard deviation.
- E) None of the above can be determined from the information given.



29. The density histogram at the right displays the distribution of heights of the 220 males in this class. The mean is 71.3 inches and the standard deviation is 2.7 inches. About what percentage of the heights fall above 74 inches? (Notice that the distribution is quite mound-shaped.)

- A) 16%
- B) 32%
- C) 68%
- D) 84%
- E) 95%

Heights of Males in 22S:008



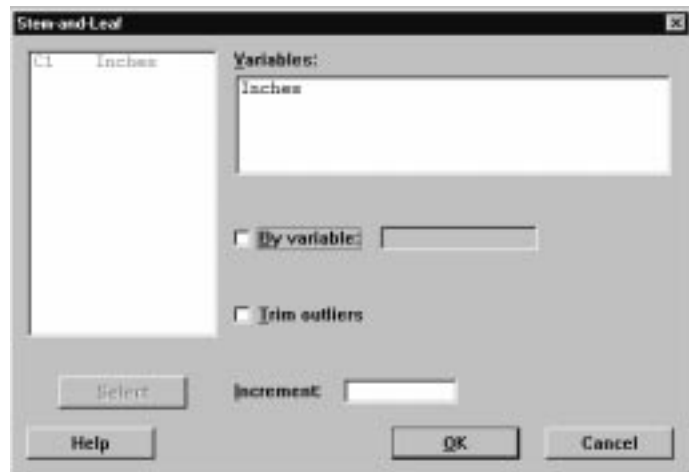
30. A data set consists of 100 observations. If 30 of the observations are in the class interval from 20 to 25, what is the *density* associated with this class interval?

- A) 0.03
- B) 0.06
- C) 0.30
- D) 30
- E) None of the above.

31. A process is a sequence of steps taken to achieve a goal.

- A) True
- B) False

32. A dimension is measured in inches and 26 data values are to be displayed in a Stem-and-Leaf diagram. To see more detail we want to split the tens-place stems into two equal-sized groups using Minitab. The Stem-and-Leaf dialog box is shown at the right. To ensure that we obtain the split stems we should:



- A) Click on the By variable and enter a number of 5
- B) Click on the By variable and enter a number of 10
- C) Click on the Trim outliers
- D) Enter an Increment of 5
- E) Enter an Increment of 10

33. Which of the following tools are designed for longitudinal analysis?

- I. Pareto Diagram
- II. Cause-and-Effect Diagram
- III. Checksheets

- A) I only
- B) II only
- C) III only
- D) I, II, and III
- E) None of the above.

34. Cross-sectional data were collected on a continuous variable but they were given to us only in numerical order from smallest value to largest value. Which of the following could we produce from the data as given?

- I. a frequency histogram
- II. the median
- III. the interquartile range

- A) I and II only
- B) II and III only
- C) I and III only
- D) I, II, and III
- E) None of the above.

35. Deming's wheel is an outline of the application of the methods of science to process improvement.

- A) True B) False

Defective Question Report

Name: _____

Section: _____

ID: _____

If you believe that a test question is defective in some way, please list your complaint here. All complaints will be considered in our interpretation of the test results.

To correctly identify the test question we must know which **form** of the test you have taken. *We also must know how you answered the question.*

Remove this last page from the exam questions and turn it in to one of the instructors in the course.

Form (circle one): A B C D E

Question number: _____ Your choice of answer on answer sheet: _____

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Question number: _____ Your choice of answer on answer sheet: _____

Your complaint:

Question number: _____ Your choice of answer on answer sheet: _____

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