

Please enter all of your answers on these exam pages. There are 25 questions on this part. A Defective Question Report is attached at the back.

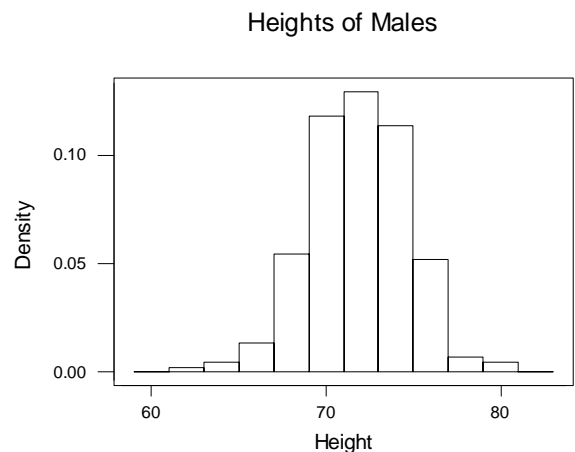
1. Seasonal patterns in longitudinal data can best be found using a
 - A) Pareto diagram
 - B) Cause-and-effect diagram
 - C) Flow diagram
 - D) Deming's process diagram
 - E) None of the above.

2. A large company has two divisions. Division A has 1000 employees and Division B has 10,000 employees. The CEO wants to compare the salary distributions in the two divisions. Which of the following displays would be *best* for this comparison?
 - A) Two frequency histograms
 - B) Two relative frequency histograms
 - C) Two stem-and-leaf diagrams
 - D) Two dotplots
 - E) Two sequence plots

3. A set of 345 accounts in a U.S. branch of your company has a mean of \$1000 and a standard deviation of \$50. These are given in U.S. dollars. One U.S. dollar is worth 1.45 Canadian dollars. What would the mean and standard deviation of the 345 accounts be in Canadian dollars?
 - A) mean = 1000 Canadian dollars, standard deviation = 50 Canadian dollars
 - B) mean = 1001.45 Canadian dollars, standard deviation = 51.45 Canadian dollars
 - C) mean = 689.66 Canadian dollars, standard deviation = 34.48 Canadian dollars
 - D) mean = 1450 Canadian dollars, standard deviation = 72.50 Canadian dollars
 - E) None of the above.

4. The density histogram at the right displays the distribution of heights of the 220 males in a class. The mean is 71.3 inches and the standard deviation is 2.7 inches. About *what percentage* of these guys were 74 inches *or shorter*? (Notice that the distribution is quite mound-shaped.)

- A) 17%
- B) 32%
- C) 68%
- D) 84%
- E) 95%



5. Sales decreased 15% from last month to 251 million dollars this month. What were sales last month (to the nearest million)?
- A) 38 million
 - B) 213 million
 - C) 289 million
 - D) 295 million
 - E) 1673 million

The two-way table below displays counts for people classified by Gender and whether or not they read your ad in the *DI*. Use this table to answer the next three questions.

	Read Ad	Did Not Read Ad
Male	10	30
Female	40	20

6. What percentage of the people read the ad?
- A) 10
 - B) 20
 - C) 30
 - D) 40
 - E) 50
7. What percentage of the males read the ad?
- A) 10
 - B) 20
 - C) 25
 - D) 30
 - E) 40
8. What percentage of the people who read the ad are female?
- A) 20
 - B) 40
 - C) 50
 - D) 70
 - E) 80
9. The University Majors for the 92 students in this class as of today would best be described as:
- A) longitudinal data on a categorical variable.
 - B) cross-sectional data on a categorical variable.
 - C) longitudinal data on a continuous variable.
 - D) cross-sectional data on a continuous variable.
 - E) data with both longitudinal and cross-sectional aspects.

10. A data set consists of 200 observations. If 50 of the observations are in the class interval from 10 to 15, what is the *density* associated with this class interval?
- A) 0.05
 - B) 0.25
 - C) 5
 - D) 50
 - E) None of the above.

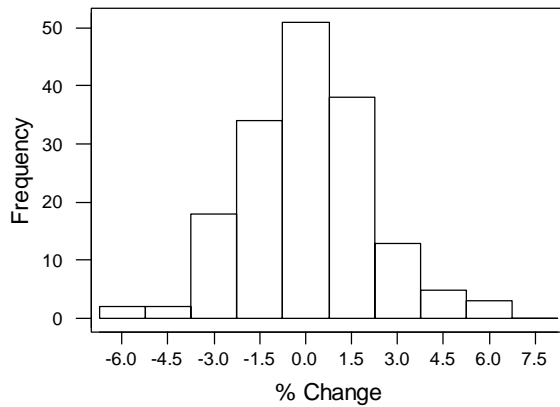
11. A stem-and-leaf diagram is shown below for some data that range from a low of 1 to a high of 39.

```
0 | 156
1 | 24699
2 | 12345789
3 | 1139
```

What is the median of the distribution?

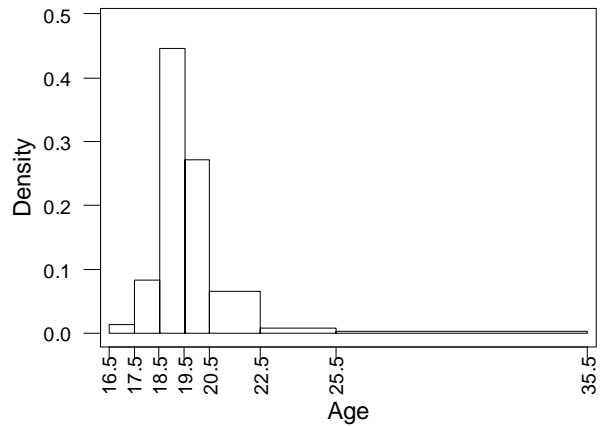
- A) 10
 - B) 10.5
 - C) 20
 - D) 22
 - E) 23
12. Which of the following statistics are resistant to outliers?
- I. The median
 - II. The interquartile range
 - III. The range
- A) I and II only
 - B) I and III only
 - C) II and III only
 - D) I, II, and III
 - E) None of the above.
13. The professor 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.

14. 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 price rose relative to the previous days' price about as often as it 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.

15. 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.

16. If a correlation coefficient is calculated from data that show a strong curved relationship, we can get a correlation coefficient greater than +1.

- A) True
- B) False

17. A **lurking variable** is a variable that plausibly explains a relationship between two other variables.

- A) True
- B) False

18. Find the correlation coefficient for the data pairs in the table below. Show your work in the table and label the columns appropriately. The standard deviation of X is 1 and of Y is 2. **You may use these standard deviations without having to calculate them.** You may not need all of the columns shown.

X	Y							
11	4							
10	8							
12	6							

The correlation coefficient is _____

A small dataset is given in the table at the right. Use these data to answer the next four questions. Show your work.

y	$y - \bar{y}$	$(y - \bar{y})^2$
5		
4		
7		
5		
9		

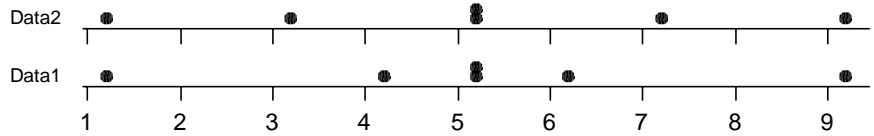
19. The median is _____

20. The mean is _____

21. The range is _____

22. The standard deviation is _____

Two dotplots are shown at the right. Use these plots to answer the next three questions. (Do not attempt to calculate anything!)



23. Data1 has the larger mean.

A) True B) False

24. Data2 has the larger median.

A) True B) False

25. Data1 has the larger standard deviation.

A) True B) False

Your Computer Number: _____ (01 through 28)

You are only to use Minitab for this exam. Do not open any other applications. Do not check your email, etc. Keep your eyes on your own screen please! Place all of your answers on this test sheet. To avoid confusion you may want to close Worksheets and graphs when you go from one question to the next.

26. Using Minitab, Open the Worksheet named Sales.mtw from the 22s:008 datasets. These data give the monthly Sales (in millions of dollars) for the months February 1992 through January 1996.

- a) How many data points are in the dataset? _____

- b) Plot these data in a sequence plot perhaps using different plotting symbols for the various months. Describe the longitudinal nature of the data using terms like random, trend, meandering, and seasonal. (You may want to use % k:\22s-008\macros\monthly)

c) Describe the distribution of Sales using the terms skewed, symmetric, and mound-shaped.

d) What are the median and interquartile range for Sales?

median = _____

interquartile range = _____

27. Using Minitab, Open the Worksheet named Restrnt.mtw from the 22s:008 datasets. These are responses from a survey of several hundred restaurants in Wisconsin. We will concentrate on just two categorical variables: Type and Owner. In the Worksheet Type is coded numerically as 1=fast food, 2=supper club and 3=other. Owner is coded as 1=sole proprietorship, 2=partnership and 3=corporation.

a) (2 pts.) What percentage of the restaurants are owned by corporations? _____

b) (2 pts.) Of the supper clubs, what percentage are partnerships? _____

c) (2 pts.) Of the corporate owned restaurants, what percentage are fast food restaurants? _____

Defective Question Report

Name: _____

Section: _____

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.

Question number: _____

Your complaint:

Question number: _____

Your complaint:

Question number: _____

Your complaint:

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28. Using Minitab, Open the Worksheet named Monthly.mtw from the 22s:008 datasets. These data give the monthly Sales (in millions of dollars) for the months August 1985 through July 1990.

- a) How many data points are in the dataset? _____

- b) Plot these data in a sequence plot perhaps using different plotting symbols for the various months. Describe the longitudinal nature of the data using terms like random, trend, meandering, and seasonal. (You may want to use % k:\22s-008\macros\monthly)

c) Describe the distribution of Sales using the terms skewed, symmetric, and mound-shaped.

d) What are the median and interquartile range for Sales?

median = _____

interquartile range = _____

29. Using Minitab, Open the Worksheet named Restrnt.mtw from the 22s:008 datasets. These are responses from a survey of several hundred restaurants in Wisconsin. We will concentrate on just two categorical variables: Type and Owner. In the Worksheet Type is coded numerically as 1=fast food, 2=supper club and 3=other. Owner is coded as 1=sole proprietorship, 2=partnership and 3=corporation.

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30. Using Minitab, Open the Worksheet named Mine.mtw from the 22s:008 datasets. These data give the monthly Sales (in millions of dollars) for the months November 1984 through October 1990.

- a) How many data points are in the dataset? _____

- b) Plot these data in a sequence plot perhaps using different plotting symbols for the various months. Describe the longitudinal nature of the data using terms like random, trend, meandering, and seasonal. (You may want to use % k:\22s-008\macros\monthly)

c) Describe the distribution of Sales using the terms skewed, symmetric, and mound-shaped.

d) What are the median and interquartile range for Sales?

median = _____

interquartile range = _____

31. Using Minitab, Open the Worksheet named Restrnt.mtw from the 22s:008 datasets. These are responses from a survey of several hundred restaurants in Wisconsin. We will concentrate on just two categorical variables: Type and Owner. In the Worksheet Type is coded numerically as 1=fast food, 2=supper club and 3=other. Owner is coded as 1=sole proprietorship, 2=partnership and 3=corporation.

a) (2 pts.) What percentage of the restaurants are owned by corporations? _____

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c) (2 pts.) Of the corporate owned restaurants, what percentage are fast food restaurants? _____

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32. Using Minitab, Open the Worksheet named Ours.mtw from the 22s:008 datasets. These data give the monthly Sales (in millions of dollars) for the months July 1983 through June 1990.

- a) How many data points are in the dataset? _____

- b) Plot these data in a sequence plot perhaps using different plotting symbols for the various months. Describe the longitudinal nature of the data using terms like random, trend, meandering, and seasonal. (You may want to use % k:\22s-008\macros\monthly)

c) Describe the distribution of Sales using the terms skewed, symmetric, and mound-shaped.

d) What are the median and interquartile range for Sales?

median = _____

interquartile range = _____

33. Using Minitab, Open the Worksheet named Restrnt.mtw from the 22s:008 datasets. These are responses from a survey of several hundred restaurants in Wisconsin. We will concentrate on just two categorical variables: Type and Owner. In the Worksheet Type is coded numerically as 1=fast food, 2=supper club and 3=other. Owner is coded as 1=sole proprietorship, 2=partnership and 3=corporation.

a) (2 pts.) What percentage of the restaurants are owned by corporations? _____

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