Exam 1 Sept. 28, 1995, Quant II Form A

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.

1. Sales this month increased 15% from last months sales of 80 million dollars. What are sales this month (to the nearest million)?

   A) 92
   B) 95
   C) 115
   D) Cannot be determined from the information given.
   E) None of the above.

2. When analyzing a variable from a cross-sectional study, one of the best things to do is:

   A) display and examine a sequence plot of the data.
   B) display and examine a distribution plot of the data.
   C) brainstorm and create a cause-and-effect diagram for the process.
   D) construct and analyze a flow diagram for the process.
   E) use Deming's process diagram to analyze the process.

3. There are 150 people in a group of college graduates. Another group consists of 800 people who ended their education after graduating from high school. Which of the following tools would be best suited for comparing the distributions of genders in the two groups?

   A) stem-and-leaf diagrams
   B) tallies of gender percentages
   C) tallies of gender counts
   D) frequency histograms of gender
   E) relative frequency histograms of gender

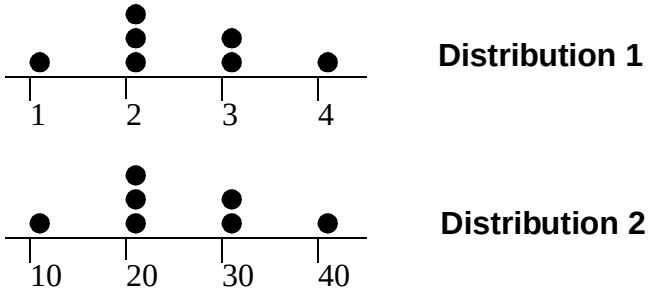
4. The Majors for the 378 students in this class as of today would best be described as:

   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.

5. In Uzbekistan the basic currency unit is the **suom**. The exchange rate is currently 30 Uzbekistan suoms for one U.S. dollar. The mean price of a house in Iowa City is $95,000 U.S. dollars. The standard deviation of house prices in Iowa City is $20,000 U.S. dollars. What are the mean and standard deviation of Iowa City house prices in Uzbekistan suoms?

   A) 2,850,000 and 18,000,000
   B) 95,000 and 600,000
   C) 285,000 and 60,000
   D) 2,850,000 and 600,000
   E) None of the above.

6. Dotplots for two distributions are shown below. What can be said about the means and standard deviations of the two distributions?



   A) mean1 < mean2 and stdev1 = stdev2
   B) mean1 < mean2 and stdev1 < stdev2
   C) mean1 = mean2 and stdev1 < stdev2
   D) mean1 < mean2 and stdev1 > stdev2
   E) mean1 < mean2 and stdev1 = stdev2

7. 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.

8. In an observational study randomization is used to select elements for observation.

   A) True B) False

9. A stem-and-leaf diagram is shown below.

```
0|156
1|24699
2|12245789
3|1139
```

What is the median of the distribution?

A) 10
B) 10.5
C) 20
D) 22
E) 22.5

10. Refering to question 9, what is the percentage of the data values that are greater than 30?

A) 10%
B) 20%
C) 30%
D) 40%
E) None of the above.

11. Which of the following tools are designed for analysis of cross-sectional data?

I. dotplot
II. stem-and-leaf diagram
III. sequence plot

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.

12. Seasonal patterns can best be found in longitudinal data using a

A) Pareto diagram
B) Cause-and-effect diagram
C) Flow diagram
D) Deming's process diagram
E) None of the above.

13. Longitudinal data were collected on a continuous variable but they were given to us only in numerical order from smallest value to largest value rather than in time order. Which of the following could we produce from data as given?

    I. a frequency histogram
    II. a relative frequency histogram
    III. a density histogram

    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.

14. If any set of data is standardized, the standard deviation of the standardized data will be zero.

    A) True B) False

15. Deming's PDCA wheel is a tool that answers who, what, when, where, why, and how.

    A) True B) False

16. Which of the following is the best tool for displaying the distribution of a variable when unequal class widths are appropriate?

    A) dotplot
    B) stem-and-leaf diagram
    C) frequency histogram
    D) relative frequency histogram
    E) density histogram

17. Incomes were reported in whole thousands of dollars. The histogram of the incomes is shown below. Based on the histogram, how many incomes are **below** 17 thousand dollars?

```
Histogram of Income   N = 10

Midpoint   Count
   10.00       1  *
   15.00       5  *****
   20.00       3  ***
   25.00       1  *
```

A) 1

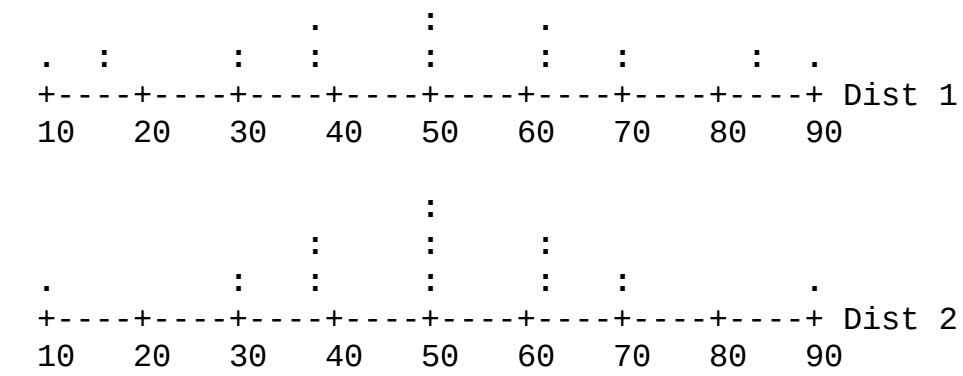
B) 3

C) 5

D) 6

E) None of the above.

18. Which of the distributions displayed below has the larger standard deviation?



A) Distribution 1

B) Distribution 2

C) The standard deviations will be the same since the ranges are the same.

D) The standard deviations will be the same since the means are the same

E) Cannot be determined from the given information.

19. The following table shows the responses of ten students to questions about their gender and their music preference.

Student ID	Gender†	Music Preference‡		Student ID	Gender	Music Preference
1	0	2		6	0	2
2	1	3		7	0	1
3	1	1		8	1	3
4	1	2		9	0	1
5	0	1		10	1	2

† 1 = female, 0 = male
‡ 1 = Jazz, 2 = Rock, 3 = Other

What percentage of students preferred jazz?

A) 10%
B) 20%
C) 30%
D) 40%
E) 50%

20. Referring to the table in question 19: What percentage of females preferred rock?

A) 20%
B) 40%
C) 60%
D) 80%
E) 100%

21. Referring to the table in question 19: What percentage of those who preferred rock were males?

A) 25%
B) 40%
C) 50%
D) 60%
E) 75%

22. If two variables have a very high positive correlation coefficient then there is necessarily a causal link between them.

A) True B) False

23. A dataset of 23 values of a variable has a mean of 10.8 and a standard deviation of 3.2. The third data value is 9.2. What is the ***standardized value*** for the third data value?

A) $(9.2–10.8)/3.2$

B) $(9.2–10.8)^2$

C) $(9.2–10.8)^2/22$

D) $(9.2–10.8)^2/23$

E) $(9.2–10.8)$

24. The table below displays counts of people by gender and marital status.

Gender	Marital Status		
	Single	Married	Other
female	100	40	60
male	200	60	40

What percentage of the married people are male? (Round to the nearest whole percent.)

A) 20%

B) 30%

C) 40%

D) 50%

E) 60%

25. Referring to the table in Question 24, what percentage of the people are single? (Round to the nearest whole percent.)

A) 20%

B) 30%

C) 40%

D) 50%

E) 60%

26. Outliers affect the following:

I. The mean
II. The correlation coefficient
III. The standard deviation

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.

27. Correlations computed from data that are totals of smaller units of study are examples of ecological correlations.

A) True B) False

28. What is the correlation coefficient between the *x*-*y* pairs shown below?

x	***y***						
100,000,000	1						
100,000,001	2						
100,000,002	3						

A) 0.00
B) 0.33
C) 0.50
D) 0.75
E) 1.00

$$r = \frac{1}{n-1}\sum_{i=1}^{n}\left[\left(\frac{x_i-\bar{x}}{s_x}\right)\left(\frac{y_i-\bar{y}}{s_y}\right)\right]$$

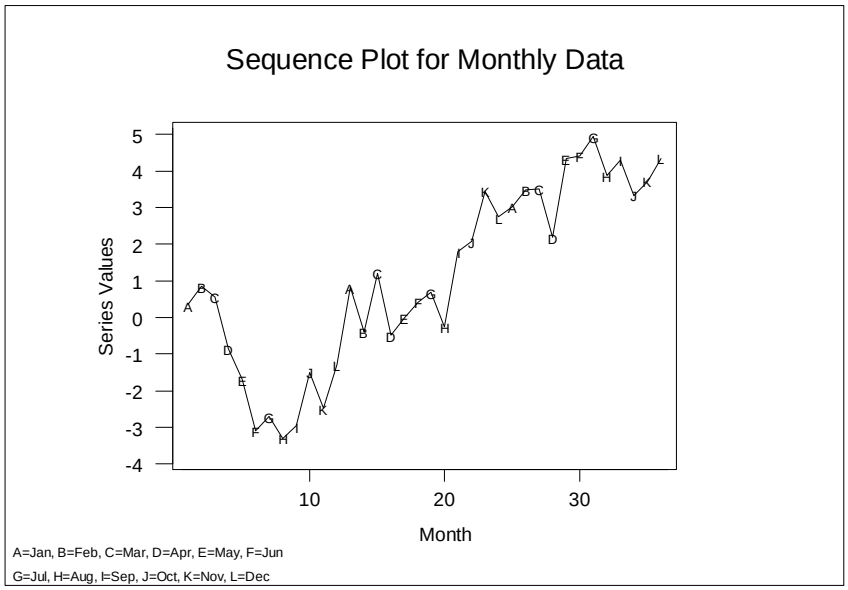
29. Which of the following are categorical variables for a group of students?

I. gender
II. major
III. height in centimeters

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.

30. A sequence plot of 3 years of monthly data is shown below. Which of the following best describes the plot?

A) random
B) meandering
C) seasonal
D) upward trend plus seasonal
E) None of the above.



31. When investigating the relationship between two variables in a cross-sectional study, you must

A) calculate the mean of each variable
B) calculate the standard deviation of each variable
C) display and examine the sequence plot of each variable
D) display and examine the distribution of each variable
E) display and examine the scatterplot of the two variables

32. Which of the following is the best tool for displaying and comparing the distributions of a continuous variable from two groups when the groups have very different sizes?

A) dotplot
B) stem-and-leaf diagram
C) frequency histogram
D) relative frequency histogram
E) Pareto chart

33. A distribution of heights is mound-shaped and has a mean of 65 inches and a standard deviation of 3 inches. About what percentage of the data values are above 68 inches?

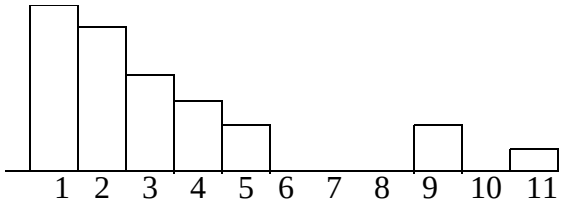
A) 5%
B) 16%
C) 68%
D) 95%
E) Nearly all.

34. Which of the following tools would best help identify the factors that may be causing variability in process results?

A) Flow Diagram
B) Cause-and-Effect Diagram
C) Stem-and-Leaf Diagram
D) Deming's Process Diagram
E) Operational Definitions

35. Which one of the following statements is true concerning the distribution whose histogram is shown below?

A) The distribution is symmetrical
B) The mean is smaller than the median
C) The mean is larger than the median
D) The mean and median are about equal
E) Cannot be answered without knowing the vertical scale.



Defective Question Report

Name:_____
Section:_____
ID: _____
Circle one: Form A B C D

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.

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

Question number: