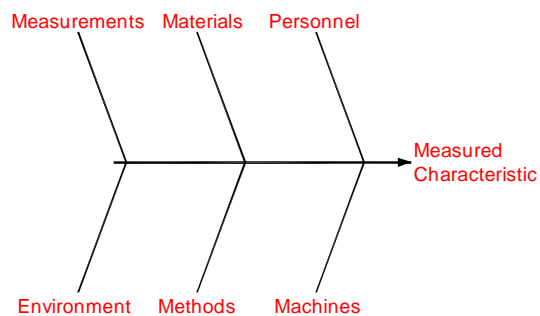


# Exam 1 Feb. 13, 1997, Quant II Form A

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. In a symmetric distribution the distance from the first quartile to the median is the same as the distance from the median to the third quartile.  
A) True  
B) False
2. Dr. W. Edwards Deming, an Iowan, is considered the founder of scientific management.  
A) True  
B) False
3. The Pareto Principle states that usually only a small number of causes are responsible for most of the variation in process results.  
A) True  
B) False
4. An observational study is one where we study the effects of changes under the control of the investigator.  
A) True  
B) False

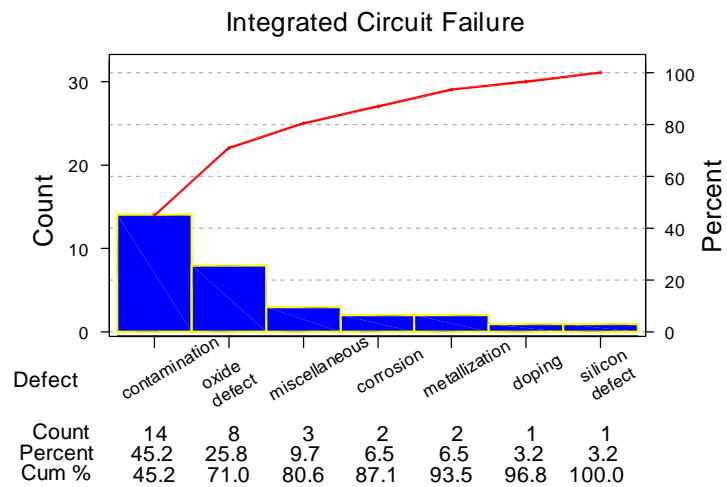
5. The diagram at the right is called:  
A) A fishbone diagram  
B) An Ishikawa diagram  
C) A Cause-and-Effect diagram  
D) All of the above  
E) None of the above



6. The variable height is being studied for a group that range in age from 3 to 25 years. In this group height would be considered a continuous variable.  
A) True  
B) False
7. The Deming Wheel (PDCA) shows how the various steps in a process progress from first to last in a graphical way.  
A) True  
B) False

8. The diagram at the right is called:

- A) A Cause-and Effect diagram
- B) A Flowchart
- C) A Deming wheel
- D) A Pareto chart
- E) A density histogram



9. A longitudinal study studies a process variable over time.

- A) True
- B) False

10. Operational definitions answer who, what, when, where, why, and how.

- A) True
- B) False

11. Seasonality in a sequence means that observations that are close in time are also close in value. Observations that are far apart in time may be very different in value.

- A) True
- B) False

12. A sequence plot is an important tool for displaying longitudinal data and

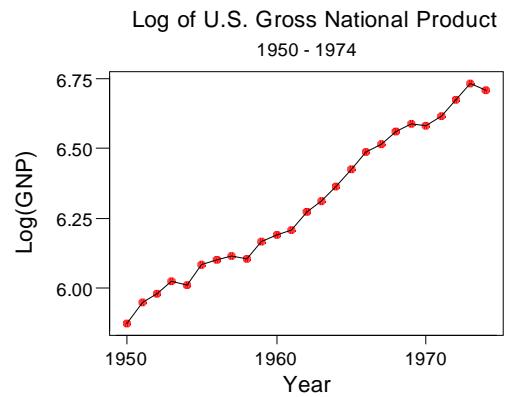
- A) predicting future behavior
- B) detecting changes in a process
- C) sharing information (communication)
- D) All of the above.
- E) None of the above.

13. A mound-shaped distribution of 1000 values has a mean of 50.4 and a standard deviation of 10.3. About how many of the 1000 data values are larger than 71?

- A) 50
- B) 160
- C) 320
- D) 680
- E) 950

14. The sequence plot at the right displays the logarithm of annual U.S. GNP for the years 1950 through 1974. It is best described as

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



15. A probability survey is an active study in which randomization is used to determine which of several treatments is applied to each element of the universe.

- A) True
- B) False

16. **Working capital** is defined as the difference between current assets and current liabilities. The following table gives current assets and liabilities (in millions of dollars) for a company for three years 1994-1996. What is the percentage change in **working capital** from 1994 to 1996?

- A) 20%
- B) 30%
- C) 50%
- D) 100%
- E) 150%

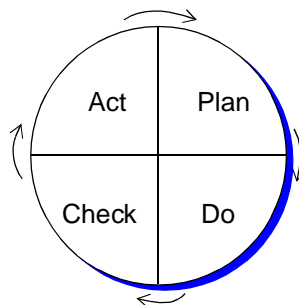
Year	Assets	Liabilities
1994	100	85
1995	130	105
1996	150	120

17. The daily stock price of the Ford Motor Company is being studied over three years. This would be best described as

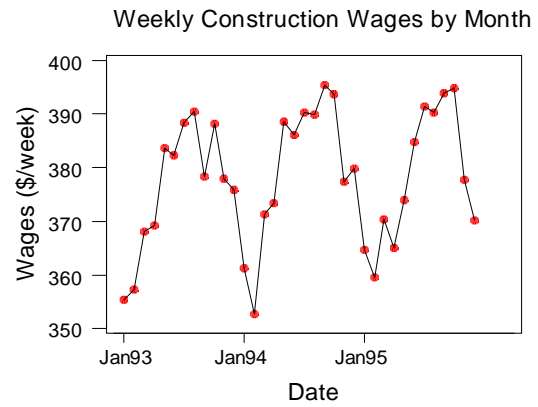
- A) a cross-sectional study of a categorical variable.
- B) a cross-sectional study of a continuous variable.
- C) a longitudinal study of a categorical variable.
- D) a longitudinal study of a continuous variable.
- E) a designed study of a continuous variable.

18. The diagram at the right is called:

- A) A Cause-and Effect diagram
- B) A Flowchart
- C) The Deming wheel
- D) A Pareto chart
- E) A Checksheet



19. The sequence plot at the right shows average weekly wages in the construction trades by month for the years 1993 to 1995. The most prominent feature in this plot is best described as

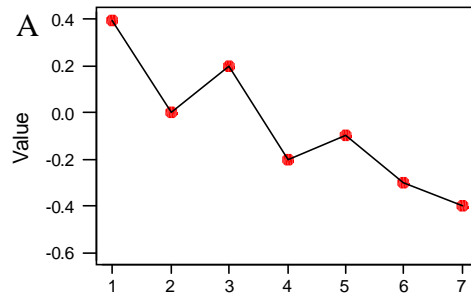


- A) randomness
- B) meandering
- C) trend
- D) seasonality
- E) None of the above.

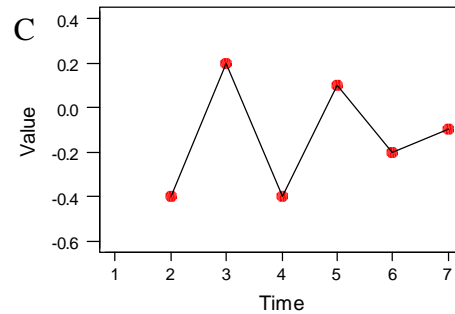
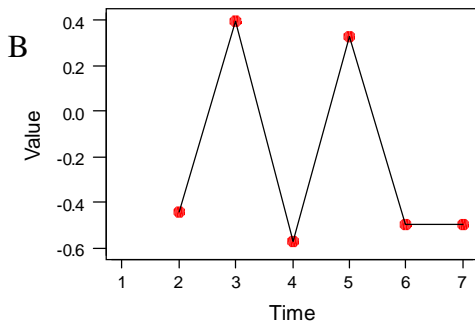
20. A company has 100 employees with a mean age of 30. This company merges with another company with 200 employees and mean age 39. What is the mean age in the combined company? (before downsizing!)

- A) 30
- B) 34.5
- C) 36
- D) 39
- E) None of the above.

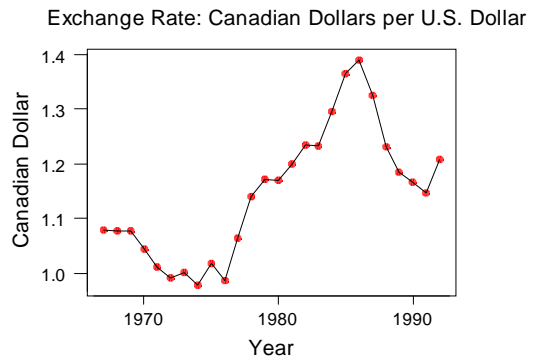
21. The three graphs, A, B, and C, at the right and below display sequence plots for an original sequence, the differences of the sequence, and the percentage changes of the original sequence. Which one displays the sequence of percentage changes?



- A) A
- B) B
- C) C
- D) None of the above.



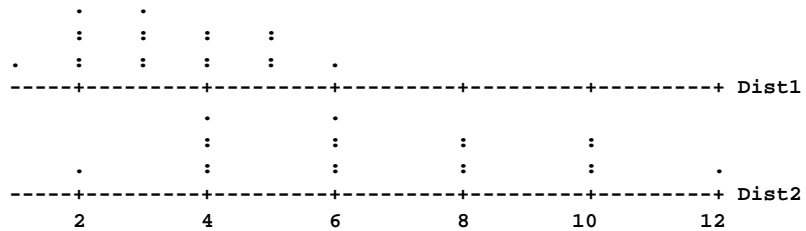
22. The sequence plot at the right displays the annual average exchange rate for Canadian dollars per U.S. dollar. Which of the following best describes this plot?



- A) random
- B) trend
- C) meander
- D) seasonal
- E) None of the above.

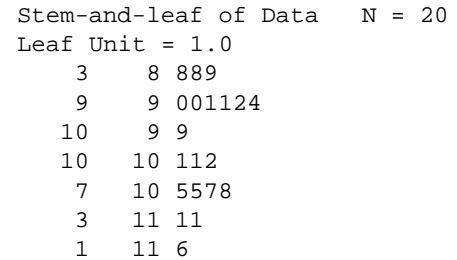
23. Dotplots of two distributions are shown below on the same scale. The standard deviation of the first distribution is 1.353. What is the standard deviation of the second distribution? (THINK! DO NOT CALCULATE!)

- A) 0.6765
- B) 1
- C) 1.353
- D) 2.706
- E) None of the above.



24. A Stem-and-Leaf display of 20 data points is shown at the right. What is the median of these data?

- A) 10
- B) 20
- C) 99
- D) 100
- E) None of the above.



25. Currently, a U.S. dollar is worth about 7 Mexican pesos. If the price of corn in U.S. dollars increases 20%, what is the percentage increase in pesos?

- A) 7%
- B) 14%
- C) 20%
- D) 140%
- E) Cannot be determined from the information given.

26. A skewed distribution has left and right sides that are (approximately) mirror images of one another.

- A) True
- B) False

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

- A) 0
- B) 1
- C) 1.63
- D) 2
- E) 2.67

Data		
99		
103		
101		

28. Which of the following statistics are resistant to outliers?

- I. The median
- II. The interquartile 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.

29. A designed study is one where the elements are chosen (or assigned treatments) by randomization.

- A) True
- B) False

30. Deming's PDCA wheel is a tool that outlines the application of applied science to the study of processes.

- A) True
- B) False

31. Checksheets are the basic tool for visually separating the "vital few from the trivial many."

- A) True
- B) False

32. A meandering series 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 before selecting the next.

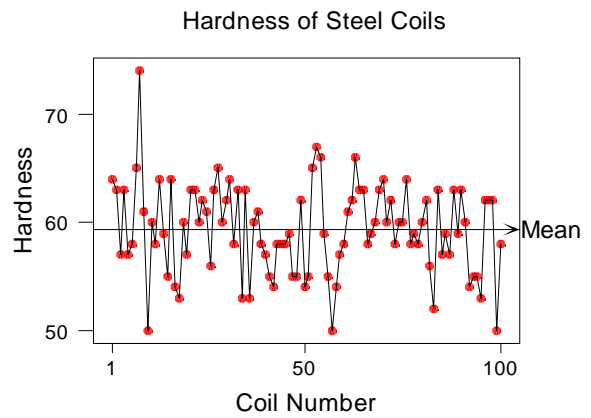
- A) True
- B) False

33. Data collected from a group of people at one point in time is called logitudinal data.

- A) True
- B) False

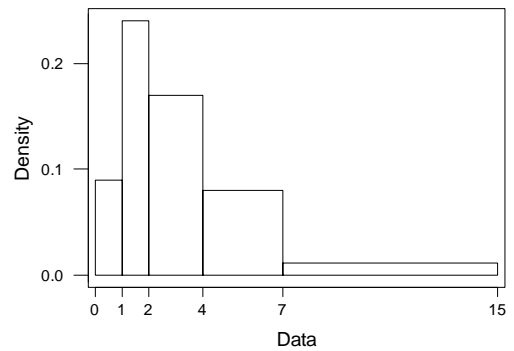
34. The sequence plot at the right displays the hardness (Rockwell B scale) of successive coils of steel produced in a steel mill. This plot would be best described as

- A) random
- B) trending
- C) meandering
- D) seasonal
- E) None of the above.



35. A density histogram of a distribution is shown at the right. The median of these data is 2.970. What can we say about the mean of the same data?

- A) Since that distribution is skewed toward larger values the mean is smaller than 2.970.
- B) Since that distribution is skewed toward larger values the mean is larger than 2.970.
- C) Since that distribution is skewed toward smaller values the mean is smaller than 2.970.
- D) Since that distribution is skewed toward smaller values the mean is smaller than 2.970.
- E) None of the above.



# 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. *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.**

Question number: