

**ECO251 QBA1
FIRST EXAM
February 16 and 17, 2006
ECO251 QBA1**

Name: _____
Student Number : _____
Class Hour: _____

Remember – Neatness, or at least legibility, counts. In most non-multiple-choice questions an answer needs a calculation or short explanation to count.

Part I. (7 points)

(Source: Harvey J. Brightman) The following numbers are a sample and represent the pulse rates of 10 well-conditioned athletes.

31, 33, 36, 37, 37, 47, 44, 41, 38, 39.

Compute the following: **Show your work!**

- a) The Median (1)
- b) The Standard Deviation (3)
- c) The 31st percentile (2)
- d) The Coefficient of variation (1)

Part II. (At least 35 points – 2 points each unless marked - Parentheses give points on individual questions. Brackets give cumulative point total.) Exam is normed on 50 points.

1. (Brightman) At an urban university, there are 7000 undergraduates whose ages are between 18 and 23, 2000 undergraduates between 24 and 29 years old, 1000 undergraduates between 30 and 35 years old and 1000 who are older than 35.
 - a) Without doing any math, explain in plain English whether the mean will be below, the same as or above the median and why. (2)
 - b) Where will the mode be relative to the mean and median? (1) [3]

2. I have the average time of 10 randomly picked runners in the Boston Marathon.
 - a) Is this a parameter or a statistic?
 - b) What symbol should you use to indicate this mean? [5]

3. For a rather shapeless distribution with one mode, a mean of 100 and a standard deviation of 2, we can say that the percent of data falling between 80 and 120 is
 - a) At least 90%
 - b) At most 90%
 - c) 100%
 - d) At least 99%
 - e) At most 99%
 - f) None of the above. [7]

4. For a mound-shaped (symmetrical) distribution with one mode, a mean of 100 and a standard deviation of 2, we can say that the percent of data falling above 96 is
 - a) About 97.5%
 - b) About 95%
 - c) Almost 100%
 - d) About 68%
 - e) None of the above

5. The drawing of inferences about an unknown whole from a known part is
 - a) Deductive reasoning
 - b) Inductive reasoning
 - c) Census taking
 - d) Sampling
 - e) None of the above. [11]

6. Observations about a discrete quantitative variable
 - a) Can be made in only two categories
 - b) Can assume values only at specific points of a scale of values with inevitable gaps between these points.
 - c) Can assume values at all points of a scale of values with no breaks in between possible values.
 - d) Cannot be meaningfully multiplied or divided.
 - e) Both b) and d) are true. [13]

7. Mark the variables below as qualitative or categorical (A), quantitative and continuous (B1) or quantitative and discrete (B2) (1 each)
 - a) GPA
 - b) Number of credits earned
 - c) Major area of study
 - d) Grade obtained in a statistics course. [17]

8. If I double all of the incomes in a sample of 1000 people, mark below which of the statistics will change.
 - a) Pearson's measure of skewness

- b) The coefficient of variation.
 - c) The mean
 - d) All of the above will change
 - e) None of the above will change
- [19]

TABLE 2-13

Given below is the stem-and-leaf display representing the amount of detergent used in gallons (with leaves in 10ths of gallons) in a month by 25 drive-through car wash operations in Phoenix. (Ng p57)

9	147
10	02238
11	135566777
12	223489
13	02

9. In table 2-13, if a percentage histogram is constructed using 9.0 to 9.9 as the first class, what percent will be in the 12-12.9 class?
[21]
10. In table 2-13 find the median amount of detergent used. [23]
11. Using the data in table 2-13. Assume that the data is to be presented in 6 classes, show how you would decide what class interval to use and list the classes below with their frequencies.
(5) [28]

	Class		Frequency
A	___ to under ___	___	___
B	___ to under ___	___	___
C	___ to under ___	___	___
D	___ to under ___	___	___
E	___ to under ___	___	___
F	___ to under ___	___	___

12. In Problem 3.42 in the text, data on waiting times in a bank in a commercial district is given. Assume that the 5-number summary is {0.38, 3.20, 4.50, 5.55, 10.03}. Use this to make a horizontal box plot, but first find the interquartile range. Then do the following: An upper fence is defined as $Q3 + 1.5(IQR)$ and a lower fence is $Q1 - 1.5(IQR)$. Indicate the fences by vertical lines at the end of the whiskers in your box plot – do not let the whiskers extend beyond the fences, but only show a fence if there is data beyond it. Any points beyond the fence should be represented by dots. (4)
[32]

13. What characteristic do the mean, median and mode have that they do not share with the variance and the interquartile range? (1) [33]