Test 1B A P Statistics Name:

Directions: *Work on these sheets. Answer completely, but be concise.*

Part 1: Multiple Choice. *Circle the letter corresponding to the best answer.*

1. A distribution of 6 scores has a median of 21. If the highest score increases 3 points, the median will be:
   (a) 21
   (b) 21.5
   (c) 24
   (d) Cannot be determined with the information given
   (e) None of the above

2. If you are told that a data set has a mean of 25 and a variance of 0, you can conclude that:
   (a) There is only one observation in the data set
   (b) There are no observations in the data set
   (c) All of the observations in the data set are 25
   (d) Someone has made a mistake
   (e) None of the above

3. Of the following measures: mean, median, IQR, and standard deviation, which are *resistant*?
   (a) Mean and median
   (b) Median and IQR
   (c) Mean and standard deviation
   (d) Median and standard deviation
   (e) None of the above

4. The quantity $\sum_{i=1}^{n} (x_i - \bar{x})$ is not used as a measure of variation because
   (a) It is always equal to zero
   (b) It is always a negative value
   (c) It is too difficult to work with
   (d) It is always a positive value
   (e) None of the above

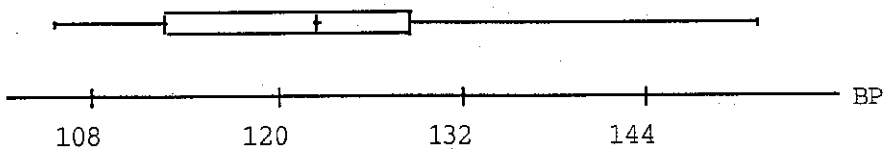
5. The variance of the following sample of five numbers: 1, 2, 3, 4, 5 is:
   (a) 2.5
   (b) 9
   (c) 10
   (d) 13.3
   (e) 55

6. Which of the following is likely to have a mean which is smaller than the median?
   (a) The salaries of all National Football League players
   (b) The scores of students, out of 100 points, on a very easy test in which most get nearly perfect scores, but a few do very poorly
   (c) The prices of homes in a large city
   (d) The scores of students, out of 100 points, on a very difficult test in which most get poor scores but a few do very well
   (e) None of the above

7. If you add 5 to each value in a data set, then the standard deviation will:
   (a) Decrease by 5
   (b) Increase by 5
   (c) Stay the same
   (d) Depend on the values of the data in the data set
   (e) None of the above

8. If you multiply each value by 5, then the standard deviation will:
   (a) Be unchanged
   (b) Be 1/5 as large
   (c) Be 5 times as large
   (d) Depend on the values of the data in the data set
   (e) None of the above

9. Consider the following boxplot of the blood pressures of 16 adult males.



   Which of the following statements is true for this group of adult males?
   (a) The minimum blood pressure is less than 100.
   (b) The maximum blood pressure is about 129.
   (c) There is an outlier having value about 152.
   (d) The median blood pressure is about 123.
   (e) None of the above

10. In order to rate TV shows, phone surveys are sometimes used. Such a survey might record several variables, some of which are listed below. Which of these variables are categorical?
   (a) The number of persons watching the show
   (b) The ages of all persons watching the show
   (c) The number of times the show has been watched in the last month
   (d) The name of the show (if any) being watched
   (e) None of the above

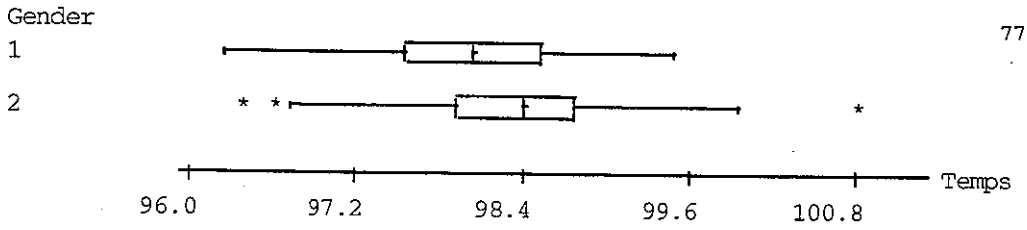
Part 2: Free Response

Answer completely, but be concise. Write sequentially and show all steps.

11. We all "know" that the body temperature of a healthy person is 98.6 °F. In reality, the actual body temperature of individuals varies. Here is a back-to-back stemplot of the body temperatures of 130 healthy individuals (65 males and 65 females).

Males		Females
3	96	
	96	4
7	96	7
9	96	8
1110	97	
32	97	22
544444	97	4
7666	97	677
998888	97	8888999
11000000	98	000001
332222	98	222222333
554444	98	444445
77666666	98	6666777777
9888	98	8888889
1000	99	0011
32	99	223
54	99	4
	99	
	99	9
	100	0
	100	
	100	
	100	
	100	8

(a) Here are boxplots, produced by Minitab, for these distributions. Label both boxplots with the five-number summary values.



(b) Verify that only 2 of the 3 points graphed by the * symbol are indeed outliers by *our* defined criteria. (Minitab uses a slightly different criterion for identifying outliers.)

12. As a user of statistics, how would you describe the following three data sets as being similar, and how would you describe them as being different?

A: 5, 7, 9, 11, 13, 15, 17 B: 5, 6, 7, 11, 15, 16, 17 C: 5, 5, 5, 11, 17, 17, 17

13. (a) Latesha says that if you add 5 to each value in a data set, then the standard deviation will increase by 5. Is Latesha correct? Explain *briefly*.

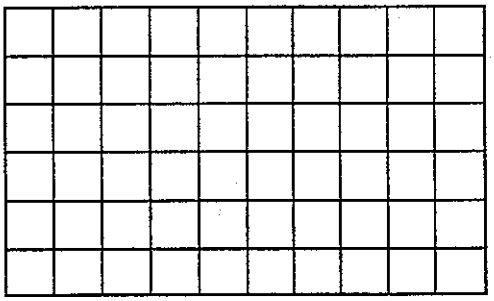
(b) Luis says that if you multiply each value in a data set by 5, then the standard deviation will be 5 times as large. Is Luis correct? Explain *briefly*.

14. The following table shows the distribution of grades on a statistics test for a class of 25 students.

Score	# of Students	Relative Frequency
90–100	4	
80–89	9	
70–79	7	
60–69	4	
Below 60	1	

(a) Compute the relative frequencies and complete the table.

(b) Construct a relative frequency histogram.



(c) Comment on any skewness of the histogram.

I pledge that I have neither given nor received aid on this test. _____

Test 1B

A P Statistics

Name: _____

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Part 1: Multiple Choice. *Circle the letter corresponding to the best answer.*

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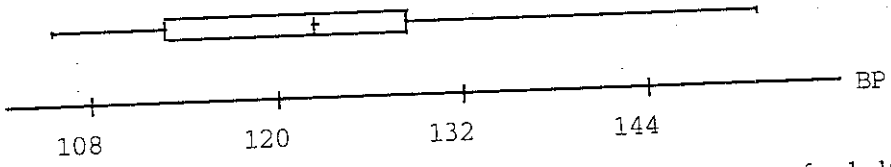

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Part 2: Free Response

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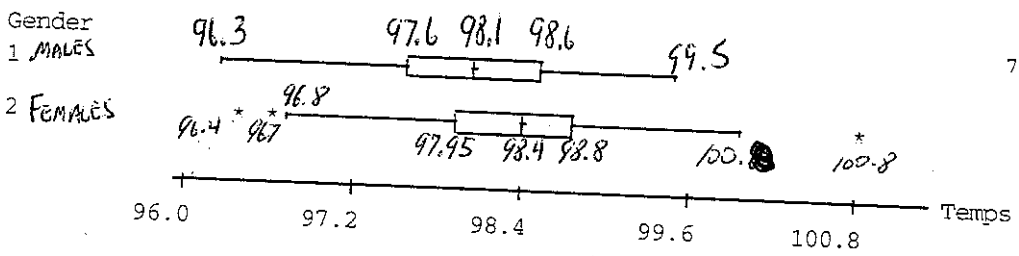


(b) Verify that only 2 of the 3 points graphed by the * symbol are indeed outliers by *our* defined criteria. (Minitab uses a slightly different criterion for identifying outliers.)

$Q_1 - 1.5(IQR) = 97.95 - 1.5(.85) = 96.675$ so 96.4 IS A LOW OUTLIER FOR FEMALES BUT 96.7 IS NOT.

$Q_3 + 1.5(IQR) = 98.8 + 1.5(.85) = 100.075$ so 100.8 IS A HIGH OUTLIER.

12. As a user of statistics, how would you describe the following three data sets as being similar, and how would you describe them as being different?

A: 5, 7, 9, 11, 13, 15, 17 B: 5, 6, 7, 11, 15, 16, 17 C: 5, 5, 5, 11, 17, 17, 17

SIMILAR: EACH MEAN IS 11

EACH MEDIAN IS 11

ALL ARE SYMMETRIC

ALL MIN OF 5 / MAX 17

DIFFERENT: DIFF. S

13. (a) Latesha says that if you add 5 to each value in a data set, then the standard deviation will increase by 5. Is Latesha correct? Explain *briefly*.

LATESHA IS WRONG; S WILL NOT CHANGE.

(b) Luis says that if you multiply each value in a data set by 5, then the standard deviation will be 5 times as large. Is Luis correct? Explain *briefly*.

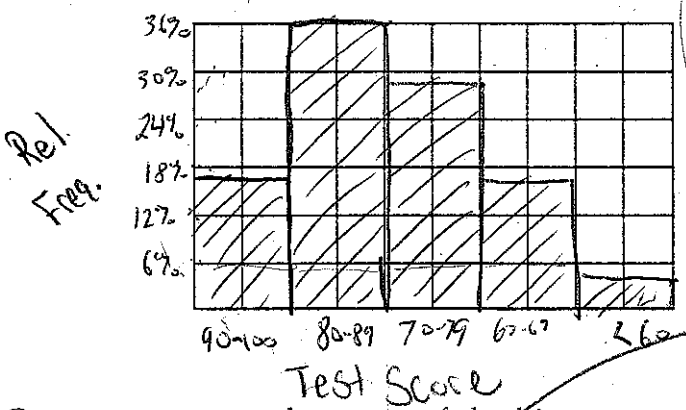
LUIS IS CORRECT. MULTIPLYING BY 5 WILL MAGNIFY THE SPREAD BY A FACTOR OF 5.

14. The following table shows the distribution of grades on a statistics test for a class of 25 students.

Score	# of Students	% Relative Frequency
90–100	4	16%
80–89	9	36%
70–79	7	28%
60–69	4	16%
Below 60	1	4%
	25	

(a) Compute the relative frequencies and complete the table.

(b) Construct a relative frequency histogram.



My Graph is Skewed right but

(c) Comment on any skewness of the histogram.

Skewed Left (if you drew the axis with small #'s first.

I pledge that I have neither given nor received aid on this test. _____