Prince Sultan University
STAT 101 Major I Examination

Fall Semester 2009-10, Term 091

Tuesday, November 10, 2009
Dr. Quazi Abdus Samad

Time Allowed**: 95 minutes**

Name: _____ _____ _____
(First) (Middle) (Last)

ID Number: _____

Section No.: _____

Important Instructions*:*

- You may use CASIO scientific calculator that does not have programming or graphing capabilities.
- You may **NOT borrow** a calculator from anyone.
- There should be **NO talking** during the examination.
- Your exam will be taken **immediately** without any warning if your mobile is seen or heard
- You must show all your work beside the problem. Be organized.
- You may use the back of the pages for extra space, but be sure to indicate that on the page with the problem.
- This examination has **06** problems with several parts in each case. Make sure that your paper has all these problems.

Problems	Max points	Student's Points
1	8	
2	12	
3	10	
4	12	
5	8	
6	10	
Total	60	

Question 1 (8 points) The 2004 purchases by a car rental agency are given in the table that follows.

Car Model	**Number purchased**
Chevrolet Cavalier	45
Ford Focus	30
Ford Taurus	60
Pontiac Grand	15
Toyota Camry	30

a. Display these data using a pie chart (**show all steps**).

b. Present these data using another type of graph (bar chart, for example) (**show all steps**).

c. What is the shape of the distribution from the bar chart?

Question 2 (12 points) The following data are the ages (in months) at which n = 15 children were first enrolled in a preschool.

40 30 47 35 34 43 34 40 30 46 45 42 41 50 45

a. Using your scientific calculator, find the mean and median for these data.

b. Construct a frequency histogram for these data using 30 as the lower limit of the first class, and a class width of 5 months (**show all steps**).

c. What is/are the modal age(s)?

d. What proportion of observations lie between 35 months and 45 months, inclusive?

e. What proportion of observations are greater than or equal to 40 months?

f. Draw a stem and leaf plot splitting the stems into two lines (**show all steps**).

Question 3 (10 points) Given the n = 9 observations **7, 9, 10, 6, 8, 7, 8, 9, 8,** calculate

a. the range.

b. the mean

c. the variance **using the computing formula**

d. the standard deviation **using the computing formula**.

e. the ratio of the range divided by the standard deviation.

f. The range is approximately how many standard deviations?

g. What proportion of measurements would you expect to fall in the 2-σ limit, if you assume the above data to be normally distributed?

h. Draw a dot plot to see whether the above data are really normally distributed.

Question 4 (12 Points) a. Find the mean, median, the lower and upper quartiles, the inter-quartile range and the standard deviation for the following data: **4, 0, 5, 3, 6, 2, 5, 10, 5, 3.**

b. Calculate the *z*-score for the smallest and largest observations in the set.

c. Is either of these observations unusually small or large? **Why or why not**?

d. Construct a box plot for the data given above (**show all steps**).

e. Is there any outlier? If yes, which one or ones?

f. Compare your results in **e** with that in **b** above. Do the results match?

Question 5 (8 points) A councilman was interested in determining whether people between the ages of 18 and 30 years of age will react to a piece of legislation differently than people over 30 years of age. The legislator polled a sample of 150 people from his district. The resulting data is shown in the table below:

	Reaction		
Age	Favor	Oppose	No Opinion
18 – 30 yrs old	25	40	15
Over 30 yrs old	45	20	5

a. Construct a side-by-side bar chart to describe the data.

b. Construct a stacked bar chart to display the data.

c. Which of the bar charts do you prefer and why?

Question 6 (10 points) A real estate agent is interested in knowing whether there is a relationship between the age of a house and the selling price. Listed below are the ages (in years) and selling prices (in $1,000s) of a sample of 6 houses the agent has sold in the past year:

Age (x)	20	15	17	16	15	18
Price (y)	60	58	59	61	59	60

a. Plot the data on a scatter plot

b. Estimate the best fitting regression line of y on x.

c. Find and interpret the correlation coefficient

d. Obtain the coefficient of determination and interpret the result.

Best of luck!