# Prince Sultan University
# Mathematics Department
STAT 101
First Major Exam
Semester II, Term 142
Thursday, March 5, 2015

Time Allowed:**1: 30** minutes

Student Name: _____

Student ID #: _____        Section #:
                                                                  Time:

Teacher's Name:  Dr. Mohammad Kaouache   Dr. Eric Benson

## Important Instructions:

1.  You may use a scientific calculator that does not have programming or graphing capabilities.
2.  You may NOT borrow a calculator from anyone.
3.  You may NOT use notes or any textbook.
4.  There should be NO talking during the examination.
5.  Your exam will be taken immediately if your mobile phone is seen or heard
6.  Looking around or making an attempt to cheat will result in your exam being cancelled
7.  This examination has 15 problems, some with several parts. Make sure your paper has all these problems.

| Problems | Max points | Student's Points |
|----------|-----------|------------------|
| 1        | 10        |                  |
| 2        | 15        |                  |
| 3,4      | 15, 10    |                  |
| 5        | 10        |                  |
| 6        | 20        |                  |
| **Total** | **75**   | **/80 =      %**  |

1. A distribution of measurements is relatively mound-shaped (bell shaped) with mean 50 and standard deviation 10.

   a. What percentage of the measurements will fall between 40 and 60? **(3 points)**

   b. What percentage of the measurements will fall between 30 and 70? **(2 points)**

   c. What percentage of the measurements will ball between 30 and 60? **(2 points)**

   d. If a measurement is chosen at random from this distribution, what is the probability that it will be greater than 60? **(3 points)**

2. The number of passes completed by Aaron Rodgers, quarterback for the Green Bay Packers, was recorded for each of the 15 regular season games that he played in the fall of 2010.

| 19 | 19 | 34 | 12 | 27 | 18 | 25 | 21 |
|----|----|----|----|----|----|----|----|
| 15 | 27 | 22 | 26 | 21 | 7  | 19 |    |

a. Draw a boxplot to describe the data. **(5 points)**

b. Calculate the mean and standard deviation for Aaron Rodgers' per game pass completions. **(5 points)**

c. What proportion of the measurements lie within two standard deviations of the mean? **(5 points)**

3. As American consumers become more careful about foods they eat, food processors try to stay competitive by avoiding excessive amounts of fat, cholesterol, and sodium in the foods they sell. The following data are the amounts of sodium per slice (in milligrams) for each of eight brands of regular American cheese. Construct a boxplot for the data and look for outliers.

<div align="center">

340    300    520    340    320    290    260    330

</div>

4. a. A sample of size n = 50 has mean $\bar{X}$ =24 and standard deviation s = 3.  What can be said about the number of observations that lie in the interval [18, 30]? **(5 points)**

b. A sample of size n = 80 has mean $\bar{X}$ =98 and standard deviation s = 13.  What can be said about the number of observations that lie **outside** of the interval [59, 137]?  **(5 points)**

5. A group of 60 workers have an average age of 32 and a coefficient of variation of 9%. What is the standard deviation of their age? **(5 points)**

  b. The body mass index of these workers has a mean of 28 and a standard deviation of 5. Which is more variable the age of the workers or their body mass index? **(5 points)**

6. The frequency distribution represents the data obtained from a sample of 75 copying machine service technicians. The values represent the days between service calls for various copying machines.

| Class boundaries | Frequency |
|---|---|
| 15.5 – 18.5 | 14 |
| 18.5 – 21.5 | 12 |
| 21.5 – 24.5 | 18 |
| 24.5 – 27.5 | 10 |
| 27.5 – 30.5 | 15 |
| 30.5 33.5 | 6 |

a. Construct the relative frequency histogram for this data. **(5 points)**

b. Find the mean. **(5 points)**

c. Find the standard deviation. **(5 points)**

d. Find the percentage of values that lie within two standard **(5 points)**