Prince Sultan University
Mathematics Department

STAT 101

Final Examination

First Semester 2014/2015, Term 141

Tuesday, January 6, 2015

Time Allowed:**120** minutes

Student Name: _____

Student ID #: _____ Section#:

Time:

Teacher's Name: Dr. Mohammed 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 8 problems, some with several parts. Make sure your paper has all these problems.

Problems	Max points	Student's Points
1	10	
2,3	5,15	
4,5	10,10	
6,7	10,10	
8	10	
Total	**80**	**/80 = %**

10 Points

1. From a group of six men and eight women, five people are chosen at random.
   a. Find the probability of chosen two women and three men. **(3 points)**.

   b. Find the probability of chosen one woman or two men.**(3 points)**.

   c. Find the probability that there are more men chosen than women. **(4 points)**.

5 Points

2. Events A and B are independent and $\Pr(A) = \frac{1}{3}$ $\Pr(A \cap B) = \frac{1}{12}$,
   a. Find $\Pr(B)$ (2 points)

   b. $\Pr(A \cup B)$ (3 points)

15 Points

3. Find the following percentiles for the following set of data

-12 -7 -6 -2 32 -8 -2 0 2 -9 17 20

a. Find the 40^{th} percentile **(3 points)**.

b. Find the interquartile range. **(4 points)**.

c. What percentage of the data is less than 2? **(4 points)**.

d. Find the 84^{th} percentile. **(4 points)**.

10 Points

4. In a distribution of 500 values, the mean is 60 and the standard deviation is 10. **Use Chebyshev's Theorem**
    a. At least how many values will fall between 40 and 75? **(5 points)**.

    b. At least how many values will be less than 50 or more than 65? **(5 points)**.

10 Points

5. A particular telephone number is used to receive both voice calls and fax messages. Suppose that 25% of the incoming calls involve fax messages, and consider a sample of 25 incoming calls. What is the probability that:
    a. At most 4 of the calls involve a fax message? **(3 points)**

    b. Between 12 and 15 (inclusive) calls involve a fax message? **(3 points)**

    c. What is the mean and standard deviation on the number of fax messages? **(4 points)**

10 Points

6. The employees of New Horizon, Inc., are divided into three distinct divisions, administration, plant operation, and sales. The following table indicates the number of employees in each division classified by sex

	Females (**F**)	Males(**M**)	Totals
Administration (**A**)	20	30	50
Plant Operation(**O**)	60	140	200
Totals	80	170	250

If an employee is chosen at random,

a. What is the probability that the person is a female? **(2 points)**

b. What is the probability that the person is a male working in the administration division? **(2 points)**

c. What is the probability that the person works in plant operation, given that the person is a female? **(3 points)**

d. What is the probability that the person is female, given that the person chosen works in the plant operation division? **(3 points)**

10 Points

7. Wages for workers in a particular industry average $11.90 per hour and the standard deviation is $0.40. If the wages are assumed to be normally distributed.

   a. What percentage of workers received wages between $10.90 and $11.90? **(3 points)**

   b. What percentage of workers received more than $10.40? **(3 points)**

   c. What percentage of workers received wages less than $11.00 or more than $12.95? **(4 points)**

10 Points

8. Cars arrive at a petrol station at an average rate of 30 per hour. Assuming that cars arrive at random, find the probability that

   a. No cars arrive during a particular fifteen minute interval. **(3 points)**

   b. In a half hour period, ten cars arrive. **(3 points)**

   c. Less than three cars arrive in a ten-minute interval. **(4 points)**