



Prince Sultan University
Mathematics Department

STAT 101

Final Major Examination

First Semester 2015/2016, Term 151

Tuesday, December 29, 2015

Time Allowed: 120 minutes

Student Name: _____

Student ID #: _____

Section#:

Time:

Teacher's Name: Dr. Eric Benson, Dr. Mohammed Kaouache

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 and 8 pages including the front page. Make sure your paper has all these problems.

Problems	Max points	Student's Points
1, 2	8, 8	
3, 4	12, 10	
5, 5	8, 10	
7, 8	12, 12	
Total	80	/80 = %

Q1. 8 pts) A sample survey is designed to estimate the proportion of sports utility vehicles being driven in Riyadh. A random sample of 500 registrations is selected from the Department of Motor Vehicles database, and 68 are classified as sports utility vehicles.

Use a 95% confidence interval to estimate the proportion of sports utility vehicles in Riyadh.

Q2. 8pts) A shopping mall estimates the probability distribution of the number of stores mall customers actually enter, as shown in the table.

x	0	1	2	3	4	5	6
$\Pr(X)$	.04	.19	.22	.28	.12	.09	.06

a. Find the mean of the number of stores entered. **(2pts)**

b. Find the standard deviation of the number of stores entered. **(3pts)**

c. Find $\Pr(X > 4)$. **(3pts)**

Q3. 12 pts) The number of students who seek assistance with their statistics assignments is Poisson distributed with a mean of 2 per day.

a. What is the probability that no students seek assistance tomorrow?
(4pts)

b. Find the probability 10 students seek assistance in a week. **(4pts)**

c. What is the mean and standard deviation of the students who seeks assistance in a week? **(4pts)**

Q4. 10 pts) Sick leave time used by employees of a firm in the course of 1 month has approximately a normal distribution with a mean of 180 hours and a variance of 350 hours.

- a. Find the probability that to total sick leave for next month will be less than 150 hours. **(5pts)**

- b. Find the sick leave time that is exceeded by 10% of all sick leave times. **(5pts)**

Q5. 8 pts) A medical statistician wants to estimate the average weight loss of people who are on a new diet plan. In a preliminary study, he guesses that the standard deviation of the population of weight losses is about 10 pounds. How large a sample should he take to estimate the mean loss to within 2 bounds with 98% confidence?

Q6. 10pts) The number of cars sold annually by used car salespeople is normally distributed with a standard deviation of 15. A random sample of 10 salespeople was taken, and the number of cars each sold is listed here. Find the 95% confidence interval estimate of the population mean. Interpret the interval estimate.

79 43 58 66 101 63 79 33 58
71

Q7. 12 pts) The heights of North American women are normally distributed with a mean of 64 inches and a standard deviation of 2 inches.

b. A random sample of six women is selected. What is the probability that the sample mean height is greater than 66 inches? **(6 pts)**

c. For a sample of 25 women. Find the mean height that is smaller than 90% of all the mean heights. **(6 pts)**

Q8. 12pts) A certain type of tomato seed germinates 90% of the time. A backyard farmer planted 25 seeds.

- What is the probability that exactly 20 germinate? **(4pts)**
- What is the probability that 20 or more germinate? **(4pts)**
- What is the mean and standard deviation of the number of seeds that germinate? **(4pts)**