KING FAHD UNIVERSITY OF PETROLEUM AND MINERALS

DEPARTMENT OF MATHEMATICAL SCIENCES
DHAHRAN, SAUDI ARABIA

STAT 211: BUSINESS STATISTICS I

Final Exam, Semester- 132, Year 2014
Time: 7:00 pm to 9:30 pm, 17th May, 2014

Student Name: ……..ID# ……..……

Tick (√) the box below corresponding to your Class **Section, Time, and Instructor**:

Tick	Section	Time	Instructor
	1	0900 to 0950	M Riaz
	2	1100 to 1150	A H Joarder

Answer all questions. Show all work on solving problems.
*You are allowed to use any scientific/electronic calculator. Mobiles are **NOT** allowed.*

Question No	Marks	Marks Obtained	Comment
1	5		
2	5		
3	10		
4	9		
5	11		
6	10		
Total	**50**		

Q1. (1+1+3= 5 points)
The probability distribution for the number of faulty items produced by company-A is as follows:

x	p(x)
0	.35
1	.39
2	.19
3	c
4	.01

a. Find the value of c.

b. What is the **probability** that the number of faulty items is **at most 2**?

c. Calculate the **expected value** and **variance** for X.

Q2. (2+3= 5 points)

a. A package delivery service claims that no more than 5 percent of all packages arrive at the address late. Assuming that the conditions for the binomial hold, if a sample of size 10 packages is randomly selected and the 5 percent rate holds, what is the **probability** that more than 2 packages will be delivered late?

b. Under the same conditions as given in part (a), if a sample of size 150 packages is randomly selected, what is the approximate **probability** that more than 20 packages will be delivered late?

Q3. (3+1+3+3=10 points)

The average amount of time a student spends on mobile phone calls per day is 100 minutes. The variable follows exponential distribution.

a. Determine 95^{th} percentile.

b. If amount of time a student calls per day exceeds 95^{th} percentile, he is considered to be wasting his time. If Khaled spends 90 minutes on calls per day, is he wasting his time?

c. Each day 30 students are sampled for 200 days. What would be shape of these 200 means? What would be the mean and variance of this distribution?

d. What is the probability that the sample mean will exceed 100 minutes?

Q4. (2+4+3= 9 points)

A random sample of 340 people in Riyadh showed that 66 listen MBC-FM, a radio station in North Riyadh City. Based on this sample information, provide answers to the following.

a. What is the point estimate for the proportion of people in Riyadh who listen to MBC-FM?

b. Provide a 99% confidence interval for the true proportion of people in Riyadh who listen to MBC-FM.

c. There are 2,254,560 people living in Riyadh. Determine a 95% confidence interval of the number of people that are expected to listen MBC-FM .

Q5. (6+5=11 points)

The posted speed limit on the cross-Bronx Expressway is 55 mph. Congestion results in much slower actual speeds. A random sample of 57 vehicles clocked speeds with an average of 33.2 mph and a standard deviation of 0.3 mph.

a) What are the upper and lower limits of the confidence interval for the mean speed given a desired confidence level of 0.95? Interpret the confidence interval you obtained.

b) How many vehicles should we sample to be able to assert with a probability of 0.98 that that the sample mean speed limit will be within 10mph of true speed limit?

Q6. [8+2=10 Marks]

The amount of time it takes a male waiter in a Fast Food Restaurant to serve a customer is normally distributed with unknown mean time μ_1 and unknown standard deviation σ. The amount of time it takes a female waiter in the same Fast Food Restaurant to serve a customer is also normally distributed with unknown mean time μ_2 and unknown standard deviation σ. The company has selected a simple random sample of 11 males and 11 females at different times. The sample mean times 10 minutes and 7 minutes respectively. The sample standard deviation is 8 minutes for males and 9 minutes for females.

a. Using the above information, derive a 95% confidence interval estimate for the difference in true mean times.

b. According to your answer above, do you think that there is a difference between the true mean times?