KING FAHD UNIVERSITY OF PETROLEUM & MINERALS
DEPARTMENT OF MATHEMATICS & STATISTICS
DHAHRAN, SAUDI ARABIA

STAT 211: Statistics for Business I
Semester 153, Final Exam
Tuesday August 30, 2016
7:00 – 10:00 pm

Name: ID #:

Question No	Full Marks	Marks Obtained
1	**10**	
2	**14**	
3	**11**	
4	**08**	
5	**07**	
6	**12**	
7	**10**	
Total	**72**	

1) You must **show all work** to obtain full credit for questions on this exam.
2) Do not keep your mobile with you during the exam, **turn off** your mobile and leave it aside.
3) **DO NOT round** your answers at each step. Round answers only if necessary at your final step to 4 decimal places.
4) You are allowed to use electronic calculators and other reasonable writing accessories that help writing the exam. Try to define events, formulate problem and solve.

Q.No.1:- (5+5 = 10 points)

A university dean is interested in determining the proportion of students who receive some financial aid. Rather than examine the records for all students, the dean wants to select a random sample.

(a) How large must the sample be if the dean wishes to be at least 97.5% confident that the error in estimating the proportion of students who receive some financial aid is less than 0.06?

(b) Suppose that the dean selected the random sample of size calculated in part (a) and found out that 37% of the students in his sample are receiving financial aid. Use a 95% confidence interval to estimate the true proportion of students who receive financial aid.

Q.No.2:- (6+4+4 = 14 points)

A researcher randomly sampled 12 graduates of an executive MBA (EMBA) program and 8 graduates of an early career MBA program (CMBA), and recorded data concerning their starting salaries. The results of salaries (in thousand Saudi Riyals) in the sample are given below:

EMBA:	12	14	36	14	11	41	16	24	21	31	23	39
CMBA:	14	11	28	24	32	18	26	30				

(a) Find the coefficient of variation for the salaries of graduates from both programs.

(b) Find the sample median and 60^{th} percentile of the salaries of executive MBA graduates.

(c) Construct a 99% confidence interval for the difference between the mean salaries of graduates from both programs. Is there a significant difference? Justify your answer.

Q.No.3:- (6+5 = 11 points)

(a) To test the effectiveness of a business school preparation course, 8 students took a general business test before and after the course. The results are given below.

Student:	1	2	3	4	5	6	7	8
Score before course:	530	690	910	700	450	820	820	630
Score after course:	670	770	1000	710	550	870	770	610

Construct a 90% confidence interval for the difference between the population means. Is the preparation course effective? Justify your answer.

(b) A corporation randomly selects 150 salespeople and finds that 66% who have never taken a self-improvement course would like such a course. The firm did a similar study 10 years ago in which 60% of a random sample of 160 salespeople wanted a self-improvement course. The groups are assumed to be independent random samples. Construct a 92% confidence interval estimate of the difference in proportion of workers who would like to attend a self-improvement course in the recent study and the past study.

Q.No.4:- (5+3 = 8 points)

(a) An advertising executive is studying television viewing habits of married men and women during prime-time hours. Based on past viewing records, the executive has determined that during prime time, husbands are watching television 60% of the time. When the husband is watching television, 40% of the time the wife is also watching. When the husband is not watching television, 30% of the time the wife is watching television. Find the probability that if the wife is watching television, the husband is also watching television.

(b) What is the preferred way for people to order fast food? A survey was conducted in 2009, and the results, based on a sample of 100 males and 100 females, were as follows:

Dining Preference	**Gender**	
	Male	**Female**
Dine inside	21	12
Order inside to go	19	10
Order at the drive-through	60	78

If a respondent is selected at random, what is the probability that he or she is a male or prefer to order at drive-through?

Q.No.5:- (4+3 = 7 points)

(a) A certain type of tomato seed germinates 90% of the time. An amateur gardener planted 25 seeds. What is the probability that 24 or fewer germinate?

(b) The following table contains the probability distribution for X = the number of traffic accidents reported in a day in a small city in Eastern province.

Find the mean and variance of X.

X	P(X=x)		
0	0.10		
1	0.20		
2	0.45		
3	0.15		
4	0.05		
5	0.05		
Total	1		

Q.No.6:- (6+6 = 12 points)

(a) Based on random sample of size 11 from a normal population with unknown sigma, one has calculated the 95% confidence interval for the population mean and obtained the result (62.5, 86.9). Using this result, find a 90% confidence interval for μ.

(b) The head librarian at the Library of Congress has asked his assistant for an interval estimate of the mean number of books checked out each day. The assistant provides the following interval estimate: from 740 to 920 books per day. If the head librarian knows that the population standard deviation is 150 books checked out per day, and he asked his assistant for a 95% confidence interval, approximately how large a sample did his assistant use to determine the interval estimate?

Q.No.7:- (4+6 = 10 points)

Sales prices of baseball cards from the 1960s are known to possess an exponential distribution with mean = SR 6.

(a) For a randomly selected card, what is the probability that its sales price will be between SR 4 and 7?

(b) Suppose a random sample of 64 cards from the 1960s is selected. What is the probability that the difference between the sample mean and population mean (i.e. $|\bar{X} - \mu|$) is less that 0.5?