KING FAHD UNIVERSITY OF PETROLEUM & MINERALS
DEPARTMENT OF MATHEMATICS & STATISTICS
Term 163

STAT 211 BUSINESS STATISTICS I

Second Exam

Wednesday August 9, 2017

Name:_____ **ID #:**_____ **Srl #:**___

SECTION: 1 2

Important Notes:

1) You must **show all work** to obtain full credit for questions on this exam.
2) Define all the events in every question of probability.

Question No	Full Marks	Marks Obtained
Q1	8	
Q2	9	
Q3	8	
Q4	8	
Q5	8	
Q6	9	
Total	*50*	

Question One (3+5=8 Marks) Seven of the 15 campus police officers available for assignment to the auditorium in which a local politician is to speak have received advanced training in crowd control. If 5 officers are randomly selected for service during the speech,

(1) what is the probability that exactly 2 of them will have had advanced training in crowd control?

(2) What is the probability that at least 3 of them will have had advanced training?

Question Two (3+3+3= 9 Marks) A trucking company has found that its trucks average 0.2 breakdowns during round trips from Khobar to Riyadh.

(1) What is the probability that a single truck will make the complete two round trips with experiencing 2 breakdowns?

(2) What is the probability that a single truck will make the complete trip without experiencing a breakdown?

(3) If 3 trucks are assigned to Khobar/Riyadh round trip, what is the probability that at least 2 of them will make the complete trip without experiencing a breakdown?

Question Three (4+4= 8 Marks) Bill has to sell nine more cars this month in order to meet his quota. Tonight he has after-dinner appointments with fifteen prospective customers, each of whom happens to be interested in a different car. If he has a 65% chance of success with each customer,

(1) What is the probability that he will meet his quota by tomorrow morning?

(2) **Approximate** the probability that he will sell more than nine cars?

Question Four (3+5=8 Marks) At a department store catalog orders counter, the average time that a customer has to wait before being served has been found to be approximately exponentially distributed, with a mean of 3.5 minutes.

(1) Determine the probability that their average waiting time was at least 4.0 minutes.

(2) For a simple random sample of 36 recent customers, invoke the central limit theorem and determine the probability that their average waiting time was at least 4.0 minutes.

Question Five (4+4=8 Marks) Assume the average fee paid by H&R Block tax preparation customers was $187. Assume that the standard deviation of fees was $60 but that we have no idea regarding the shape of the population distribution.

(1) Use the normal distribution to determine the probability that the mean fee for a simple random sample of 5 customers was less than $170? What assumption(s) would be needed in order to answer this part?

(2) What is the probability that the mean fee for a simple random sample of 36 customers was less than $170? What assumption(s) would be needed in order to answer this part?

Question Six (4+5=9 Marks) Based on past experience, 20% of the contacts made by a firm's sales representatives result in a sale being made. Ahmad has contacted 100 potential customers but has made only 10 sales. Assume that Ahmad's contacts represent a simple random sample of those who could have been called upon. Given this information:

(1) What is the sampling distribution of the sample proportion, p = proportion of contacts that resulted in a sale being made?

(2) For simple random samples of this size, what is the probability that $p \leq 0.14$?