KING FAHD UNIVERSITY OF PETROLEUM & MINERALS

DEPARTMENT OF MATHEMATICAL SCIENCES
DHAHRAN, SAUDI ARABIA

STAT 211: BUSINESS STATISTICS I

Major Exam 2, Semester- 132, Year 2014
Time: 6:00 pm to 7:30 pm, Wednesday, 9th April, 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	10		
2	7		
3	8		
4	8		
5	7		
Total	40		

Q1. (5+2+3= 10 points).

A marketing research team is considering using a mailing list for an advanced campaign. They know that 60% of the people on the list have a Master Card and that 30% have an American Express Card. Of those holding MasterCard, 33.33% have American Express Card.

a. Suppose a person on the list is known to have an American Express Card. What is the probability that the person has also a Master Card?

b. Let we have two events defined as:
A: a person having American Express Card and M: a person having Master Card

i) Are A and M independent? Explain.

ii) Compute Pr($A \cap \bar{M}$)

Q.2. (4+3=7 points).
A study by the Center for Financial Services Innovation showed that 64% of US income earners aged 15 and older have a bank account. A random sample of 5 income earners aged 15 and older is selected.

a. What is the probability that more than 2 people have an account?

b. Determine the expected number of people who have the account if 200 people have been selected.

Q3. **(3+5=8 points).**

Based on the past experience, it is assumed that the number of flaws per foot in rolls of grade 2 paper follows a Poisson Distribution with a mean of 1 flaw per 5 feet of paper.

a. What is the average number of flaw in 1-foot roll of paper?

b. What is the probability that in a 12-foot roll, there will be more than 1 but less than 4 flaws?

Q4. (4+4=8 points).

Xiang Construction Company is determining whether it should submit a bid for a new shopping center. In the past, Xiang's main competitors, Base Construction Company, has submitted bids 80% of the time. If base construction company does not bid on a job, the probability that Xiang construction company will get the job is 0.60. If base construction company bids on a job, the probability that Xiang Construction Company will get the job is 0.35.

a) If Xiang Construction Company gets the job, what is the probability that Base Construction Company did not bid?

b) What is the probability that Xiang Construction Company will get the job?

Q5. (2+4+1=7 points).

The following table contains the probability distribution for the number of traffic accidents daily in a small city:

Number of Accident Daily (X)	***P*(X)**
0	0.10
1	0.20
2	0.45
3	K
4	0.05
5	0.05

a) Find the value of k.

b) Compute the mean number of accidents per day.

c) What is the percentage of occurrences when there were no accidents?

Formulae for STAT211 Major 2

- $P(A \cup B) = P(A) + P(B) - P(A \cap B)$
- $P(A \cap B') = P(A \cap \bar{B}) = P(A) - P(A \cap B)$
- $P(A \mid B) = \frac{P(A \cap B)}{P(B)}$, $P(B) > 0$
- $P(A \cap B) = P(A) \times P(B \mid A) = P(B) \times P(A|B)$
- $P(B_j \mid A) = \frac{P(B_j \cap A)}{P(A)} = \frac{P(A \mid B_j)P(B_j)}{\sum_{i=1}^{k} P(A \mid B_i)P(B_i)}$ for $j = 1,2,...,k$

- $E(X) = \sum xP(x)$, $E(X^2) = \sum x^2 P(x)$, $\sigma^2 = E(X^2) - (E(X))^2$

- $P(x) = \binom{n}{x} p^x (1-p)^{n-x} = \frac{n!}{x!(n-x)!} p^x (1-p)^{n-x}$

  $\mu = np$, $\sigma = \sqrt{np(1-p)}$
- $P(x) = \frac{(\lambda)^x e^{-\lambda}}{x!}$, $\mu = \lambda$, $\sigma = \sqrt{\lambda}$
- $P(x) == \frac{\binom{K}{x}\binom{N-K}{n-x}}{\binom{N}{n}}$