Prince Sultan University
STAT 101
Second Examination
First Semester 2010/2011, Term 101
Wednesday, 29th December 2010
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Time Allowed: 90 minutes

Maximum points: 50 points

Name: _____ _____ _____
(First) (Middle) (Last)

ID Number: _____ Serial Number:_____ Section:_____

Important Instructions:

1. You may use CASIO scientific calculator that does not have programming or graphing capabilities.
2. You may NOT borrow a calculator from anyone.
3. You do NOT get special consideration if you forget your calculator.
4. Don't use notes or any notebook.
5. There should be NO talking during the examination.
6. Your exam will be taken immediately without any warning if your mobile is seen or heard.
7. You must show all your work beside the problem. Be organized.
8. You may use the back of the pages for extra space, but be sure to indicate that on the page with the problem.
9. This examination has **9** problems, some with several parts. Make sure that your paper has all these problems

Problem	Max points	Student's Points
1	6	
2	6	
3	4	
4	8	
5	4	
6	8	
7	4	
8	6	
9	4	
Total	50	

Q1 (6 points total)

Let A and B two events such that $P(\overline{A}) = 0.4$, $P(B) = 0.3$ and $P(A \text{ and } B) = 0.1$.

a. **(3 Points)** Calculate $P(B|A)$.

b. **(3 Points)** Calculate $P(A \text{ or } B)$.

Q2 (6 points total)

a. **(2 Points)** How many different four-digit numbers can be formed from the digits 2, 3, 4, 6, 9 such that the first digit is 4, also you can't repeat the digit?

b. **(2 Points)** A box contains eight cards. In how many ways you can draw three cards without replacement.

c. **(2 Points)** How many different 4-letter permutations can be formed from the letters in the word ***customer*** ?

Q3 (4 points)

Let A and B be two independent events such that, $P(\boldsymbol{A}|\boldsymbol{B}) = 0.8$ and $P(\boldsymbol{B}|\boldsymbol{A}) = 0.6$.

Calculate $P(A \text{ or } B)$

Q4 (8 points total)

A group of 100 people were classified according to their gender and smoking habits. The results are given in the following table:

Smoking Habits

Gender	Smoker	Non-smoker
Male	20	40
Female	10	30

One person is selected at random from this group

a. **(2 Points)** Find the probability that the selected person is a smoker.

b. **(2 Points)** Find the probability that the selected person is a male or a smoker.

c. **(2 Points)** Find the probability that the selected person is a female and a non-smoker.

d. **(2 Points)** Given that the selected person was a male. Find the probability that he is a smoker.

<u>QUESTION</u> 5(4 points)

A box contains six black balls and four white balls. Three balls are drawn at random one at a time and without replacement. Find the probability that we get exactly two black balls.

QUESTION 6 (8 points total)

Let X be a random variable with the following probability distribution:

x	-1	0	1	2
P(x)	0.3	0.35	0.13	0.22

a. **(2 Points)** Calculate $P(-1 < X \leq 1)$.

b. **(2 Points)** Calculate μ (the mean of the random variable X).

c. **(4 Points)** Calculate σ^2 (the variance of the random variable X).

QUESTION 7 (4 points)

The number of car accidents occurs on a certain road intersection follow a Poisson distribution with an average of three accidents per one month. Find the probability of exactly four car accidents occur in two months period.

QUESTION 8 (6 points total)

a. **(3 Points)** In a survey, 60% of American said they own an answering machine. If 14 Americans are selected at random, find the probability that exactly 7 own an answering machine.

b. **(3 Points)** A study found that 1% of Social Security recipient are too young to vote. If 800 Social Security recipients are randomly selected, find the mean and variance of the number of recipients who are too young to vote.

QUESTION 9 (4 points)

Before a television set leaves the factory, it is given a quality control check. The probability that a television contains 0, 1, or 2 defects is 0.88, 0.08 and 0.04, respectively. In a sample of 6 televisions, find the probability that 3 will have 0 defects, 2 will have 1 defect, and 1 will have 2 defects.

Good Luck