Prince Sultan University
STAT 101
Major II Examination
Fall Semester 2009-10, Term 091
Tuesday, December 22, 2009
Dr. Quazi Abdus Samad

Time Allowed**: 90 minutes**

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

ID Number: _____

Section No.: _____

Important Instructions*:*

You may use CASIO scientific calculator that does not have programming or graphing capabilities
You may **NOT borrow** a calculator from anyone.
There should be **NO talking** during the examination.
Your exam will be taken **immediately** without any warning if your mobile is seen or heard
You must show all your work beside the problem. Be organized.
You may use the back of the pages for extra space, but be sure to indicate that on the page with the problem.
This examination has **09** problems with several parts in each case. Make sure that your paper has all these problems.

Problems	Max points	Student's Points
1	8	
2	6	
3.4	12	
5,6	11	
7,8	14	
9	9	
Total	**60**	

Q.1. (8 points) **Please show the formula wherever applicable**.

a. Six dice are tossed. How many simple events are in the sample space?

b. Seven coins are tossed. How many simple events are in the sample space?

c. Four balls are selected from a box containing 12 balls. The order of selection is not important. How many simple events are in the sample space?

d. In how many ways can you select three people from a group of 15 if the order of selection is important?

e. Find P^{10}_{5} =

f. Find C^{19}_{1} =

g. How many football matches will be there if there are 6 football teams in total?

h. Suppose you have 50 people in a club. In how many ways can you make a committee of 4 persons?

Q.2. (6 points) Men and women often disagree on how they think about selecting a mate. Suppose that a poll of 1000 individuals in their twenties gave the following responses to the question of whether it is more important for their future mate to be able to communicate their feelings (F) than it is for that person to make a good living (G).

	Feeling (F)	Good living (G)	Totals
Men (M)	.35	.20	
Women (W)	.36	.09	
Totals			

If an individual is selected at random from this group of 1000 individuals, calculate the following probabilities: (**Show the formula**)

a. P(F)

b. P(G)

c. P(F/M)

d. P(F/W)

e. P(M/F)

f. P(W/G)

Q.3. (5 points) An experiment consists of tossing a single die and observing the number of points that show on the upper face. Events A, B and C are defined as follows:

A: Observe a number less than 4
B: Observe a number less than or equal to 4
C: Observe a number greater than 3

a. Find P(A/B)

b. Find P(B UC)

c. Find P(B ∩C)

d. Find $P[(AUB)^C]$

e. Find $P[(AUBUC)^C]$

Q.4 (7 points) Of the delegates at a convention, 60% attended the breakfast forum, 70% attended the dinner speech, and 40% attended both events. Define events A and B as follows:

A: attended the breakfast forum
B: attended the dinner speech.

a. If a randomly selected delegate is known to have attended the dinner speech, what is the probability he or she also attended the breakfast forum?

b. What is the probability that a randomly selected delegate either attended the breakfast forum, or attended the dinner speech, or attended both?

Q.5. (5 points) An experiment can result in one of six equally likely simple events, E1, E2, E3, E4, E5, E6. Events A, B and C are defined as follows:

A: E1, E2, E3, **B**: E1, E3, E5, E6, **C**: E4, E6

Find the probabilities associated with these compound events by listing the simple events in each:

a. A^c

b. B/C

c. A/B

d. Are events A and B independent? **Why or why not**?

e. Are events B and C are mutually exclusive? **Why or why not**?

Q.6. (6 points) City crime records show that 28% of all crimes are violent and the rest are nonviolent. 80% of violent crimes are reported versus 65% of nonviolent crimes.

a. What is the overall reporting rate for crimes in the city?

b.If a crime in progress is reported to the police, what is the probability that the crime is violent?

c.What is the probability that the crime is nonviolent?

Q. 7 (6 points) Suppose the random variable x has the following probability distribution:

x	0	1	2	3	4	5
P(x)	.28	.37	.17	.12	.05	.01

a. Find $P(x > 1)$

b. Find $P(0 \leq X \leq 4)$

c. Find $P(x < 3)$

d. Find $P(x \leq 2)$

Q.8. (8 points) Let *x* be a random variable with the following probability distribution:

x	0	1	2	3	4
P(x)	0.20	0.25	0.25	0.20	0.10

a. Find the mean of *x* **(Show the formula)**.

b. Find the standard deviation of *x (***Show the formula***)*.

c. Find the probability that x falls into the interval $\mu \pm 2\sigma$.

d. Is the result in part c above in line with the Empirical Rule? **Why or why not?**

Q.9. (9 points) Let x be a binomial random variable with n = 8 and p = 0.4. Find these probability values (**please show all steps**): (Use the binomial formula or the Cumulative binomial probability Table I).

a. P (x =3)

b. P(x≥7)

c. P(x<3)

d. P(x≤3)

e.P(4<x<6)

f.the mean of the binomial variable

g. the variance of the binomial variable

h. the standard deviation of the binomial variable

Best of luck!