Prince Sultan University
STAT 101
Second Examination
Second Semester 2011/2012, Term 112
Monday, 30th April 2012
Dr. Bahha Eldin Abdalla

Time Allowed: 90 minutes

Maximum points: 40 points

Name: _____ _____ _____ ID Number # _____

(First) (Middle) (Last)

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 11 problems, some with several parts. Make sure that your paper has all these problems

Problem	Max points	Student's Points
1,2	8	
3,4,5,6	16	
7,8,9,10,11	16	
Total	***40***	

Q1 (2 points) A coin is flipped three times.
(a) Draw a tree diagram that represents all possible outcomes.

(b) Find the probability of "exactly one head occurred".

Q2 (6 points) The age and gender demographics for a college full-time students are outlined in the table below.

	19 and under	20 - 24	25 - 29	30 and over
Female	2928	1658	420	649
Male	2883	1705	377	438
Total	5811	3363	797	1087

If one of these students is selected at random, what is the probability that the student is

(a) a male?

(b) between 20 and 24 years of age?

(c) a female and 30 and over?

(d) a male or 19 years old and under?

(e) between 25 and 29 years of age, given the student is female?

(f) a male student, given the student is 20 or older?

Q3 (4 points) Of Ph. D. students, 60% have paid assistantships. If 15 students are selected at random, find the probability that at least 3 have an assistantship.

Q4 (4 points) A shipment of 24 computer keyboards is rejected if 4 are checked for defects and at least 1 is found to be defective. Find the probability that the shipment will be returned if there are actually 5 defective keyboards.

Q5 (4 points) Transportation officials reported that 8.25 out of every 1000 airline passengers lost luggage during their travels last year. If we randomly select 400 airline passengers, what is the probability that 5 lost some luggage?

Q6 (4 points) Find *k* then find the mean and the standard deviation for the following probability distribution: $P(x) = \frac{x+2}{k}$ for $x = 0,1,2,3$

Q7 (3 points) Use the multinomial formula and find the probability:
$n = 6,\ X_1 = 3,\ X_2 = 2,\ X_3 = 1,\ p_1 = 0.5,\ p_2 = 0.3,\ p_3 = 0.2$

Q8 (4 points) (a) How many ways can an adviser choose 5 students from a class of 20 if they are all assigned the same task?

(b) How many ways can the 5 students be chosen from the class of 20 if they are each given a different task?

(c) How many 4-letter code words can be made if repetitions are permitted?

(d) How many 4-letter code words can be made if repetitions are not permitted?

Q9 (4 points) If $P(A) = 0.15,\ P(B) = 0.3,$ and $P(C|A) = 0.24,$

(a) If *A* and *C* are independent, what is $P(A \cap C)$?

(b) If A and B are mutually exclusive, what is $P(A \cup B)$?

Q10 (2 points) A student tells you he is working with a discrete random variable, *x*, which takes an integer value from 0 to 50 and have a mean of 40 and a variance of 10. Is *x* a binomial random variable?

Q11 (3 points) Let the random variable *x* have the Poisson distribution with mean 2. What is the probability *x* will fall in the interval $\mu \pm 2\sigma$.