Prince Sultan University

STAT 101
Major Test II
Semester I, Term 161
Tuesday, December 5th, 2016

Time Allowed: **90** minutes

Student Name: _____

Student ID #: _____

Teacher's Name: _____Section #: _____

Serial #: _____

Important Instructions:

1. You may use a scientific calculator that does not have programming or graphing capabilities.
2. You may NOT borrow a calculator from anyone.
3. You may NOT use notes or any textbook.
4. There should be NO talking during the examination.
5. Your exam will be taken immediately if your mobile phone is seen or heard
6. Looking around or making an attempt to cheat will result in your exam being cancelled
7. This examination has 6 problems, some with several parts. Make sure your paper has all these problems.

Problems	Max points	Student's Points
1,2	22	
3,4	30	
5,6	28	
Total	**80**	

Q1. (12 points) A grocery store employs cashiers, stock clerks, and deli personnel. The distribution of employees according to marital status is shown below; if an employee is selected at random, find these probabilities :(**Show your work in details**)

	Cashier	**Stock clerks**	**Deli personnel**
Married	8	12	2
Not Married	5	12	2

a. (4 points) Given that the employee is not married, what is the probability that the employee is a stock clerk?

b. (4 points) What is the probability of getting a cashier or deli personnel?

c. (4 points) Are the events: A="The employee is a Deli personal" and B="The employee is Married" independent? **Explain your answer**.

Q2. (10 points) A football team plays 60% of its games at home and 40% away. It typically wins 80% of its home games and 55% of its away games. If the team wins on a certain Saturday, what is the probability that it played at home? (**Show your work in details**)

Q3. (15 points) Ahmad is considering an investment in a company. He is interested in buying a number of shares of this company and keeps them for one year. The price of a single share at this time is $16 and the forecasted price a year from today is given in the following table:

a. (1 points) Does the information above describe a valid probability distribution function? **Justify your answer why yes or why not.**

Price of stock in one year	15	16	17	18	19
Probability	0.15	0.20	0.26	0.21	0.18

b. (6 points) What is the expected value of the stock price a year from today?

c. (8 points) What is the variance and standard deviation of the stock price a year from today?

Q4. (15 points) A random variable follows a binomial distribution with a probability of success equal to 0.45. For $n = 11$, find: (**Note: Show your work in details**)

1. (2 points) The mean

2. (2 points) The standard deviation

3. (3 points) The probability of exactly 1 success

4. (4 points) The probability of 3 or fewer successes

5. (4 points) The probability of at least 8 successes

Q5. (13 points) On Saturday mornings, customers enter a boutique at a suburban shopping mall at an average of 0.50 customers per minute. Let Y = number of customers arriving in a specific 10 minute time interval. Find the following: (**Note: Show your work in details**)

a. (3 points) $P(Y = 3) =$

b. (4 points) $P(Y > 4) =$

c. (2 points) Find the **mean** and **standard deviation** of Y .

d. (4 points) What should the average number of customers entering the mall **per minute** be, if the probability of zero customers entering the mall at any randomly selected one minute interval is 0.30.

Q6. (15 points) A grading scale is set up for 1000 students' test scores. It is assumed that the scores are **normally distributed** with a mean score of 75 and a standard deviation of 15. (**Note: Show your work in details**)

a. (5 points) What percentage of students will have scores more than 95?

b. (5 points) How many students will have scores between 45 and 75?

c. (5 points) What should the passing grade be if we want 90% of the students to pass the test