KING FAHD UNIVERSITY OF PETROLEUM & MINERALS
DEPARTMENT OF MATHEMATICS AND STATISTICS
Term 141

STAT 211 BUSINESS STATISTICS I

Monday December 1, 2014

Name: _____ ID #:_____

Important Note:

- Show all your work including formulas, intermediate steps and final answer

Question No	Full Marks	Marks Obtained
1	6	
2	6	
3	6	
4	6	
5	6	
6	10	
Total	40	

Q1: Consider the following function $f(x) = \begin{cases} 2(1-x), & 0 < x < 1 \\ 0, & otherwise \end{cases}$

a. Verify that it is a probability density function of some random variable X. (2 pts)

b. Compute the median value of X. (2 pts)

c. Compute the average value of X. (2 pts)

Q2: Determine the following:

a. The probability that a uniform variable whose range is between 10 and 30 assumes a value in the interval 10 to 20 or 15 to 25. (3 pts)

b. The 90th percentile for an exponential random variable that has a mean equal to 0.4 (3 pts)

Q3: the time to failure for a power supply unit used in a particular brand computer is thought to be exponentially distributed with a mean of 4000 hours as per the contract between the vendor and the PC maker. The PC manufacturer has just had a warranty return from a customer who had the power supply fail after 2100 hours of use.

a. What is the probability that the power supply would fail at 2100 or less? (2 pts)

b. Based on your answer in part a above, do you feel the PC maker has a right to require that the power supply maker refund the money on this unit? (2 pts)

c. Assume the PC maker has sold 1000000 computers with this power supply, approximately how many should be returned due to failure at 2100 hours or less? (2 pts)

Q4: The amount of drink a machine pours into bottles has a mean of 36 oz. with a standard deviation of 0.15 oz. Suppose we take a random sample of 36 bottles filled by this machine. Find the probability that the mean of the sample exceeds 36.01 oz. (6 pts)

Q5: According to a survey, only 15% of customers who visited the web site of a major retail store made a purchase. Random samples of size 50 are selected. What is the probability that a random sample of 50 will have at least 30% of customers who will make a purchase after visiting the web site? (6 pts)

Q6: A global financial institution transfers a large data file every evening from offices around the world to its headquarters. The time required to process the file is normally distributed with mean of 1.5 hours and standard deviation of 15 minutes.

a. If one file selected at random, what is the probability that it will take longer than 1 hour and 55 minutes to process the file? (4 pts)

b. If the manager must be present until 85% of the files are processed, how long will the manager need to be there? (3 pts)

c. What percentage of the data files will take between 63 minutes and 110 minutes to be process? (3 pts)