Prince Sultan University
STAT 101
Final Examination
Second Semester 2012-2013, Term 122
Saturday, MAY 25th, 2013
Dr. Bahaa El-din Abdalla and Dr. Khaled Manasrah

Time Allowed: 120 minutes
Maximum points: 60 points

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

Section: _____ **Instructor: _____**

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. Work in a neat and well-organized manner. Show your work on all problems. Please indicate your final answers clearly.
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.

Problems	Max Points	Points Earned
1	12	
2,3,4	15	
5,6,7	17	
8,9	16	
Total	60	

1) The following are the numbers of text messages made in a given day for a sample of 16 PSU Students.

2, 8, 18, 13, 17, 10, 2, 10, 8, 6, 5, 3, 9, 15, 18, 10

a) (1 point) Find the mean.

b) (2 points) Find the median

c) (1 point) Find the mode

d) (2 points) Find the variance.

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e) (2 points) Find the value that corresponding to the 70th percentile.

f) (3 points) Draw a boxplot for the data

g) (1 point) Comment on the shape of the distribution

2) In Riyadh city, 30% of the cars have a broken taillight, 15% have a broken headlight and 10% have both a broken taillight and a broken headlight. Suppose we randomly choose one car. Find the probability that

   a) (2 points) The car has either a broken headlight or a broken taillight.

   b) (2 points) The car has a broken headlight given that it has a broken taillight.

3) If $P(M) = 0.3$, $P(N) = 0.4$, and events M and N are mutually exclusive, find

   a) (1 point) $P(M \text{ or } N)$

   b) (2 points) $P(M \text{ or } \overline{N})$

   c) (2 points) $P(M \mid \overline{N})$

   d) (2 points) Are events M and N independent? Explain.

4) (4 points) A shipment of 24 electric typewriters is rejected if 3 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 typewriters that are defective.

5) Suppose that the probability of suffering a headache after taking a Statistics exam is 0.14. If 50 students are taking the exam, find the probability that:
   a) (2 points) Exactly 5 suffer a headache.

   b) (2 points) At least two suffer a headache.

   c) (2 points) At least 49 do not suffer a headache.

6) The number of calories in a salad on the lunch menu is normally distributed with mean = 200 and standard deviation = 5. Find the probability that the salad you select will contain
   a) (3 points) Between 190 and 202 calories.

   b) (3 points) More than 208 calories.

7) (5 points) Two out of five adult smokers acquired the habit by age 14. If 400 smokers are randomly selected, find the probability that 170 or fewer acquired the habit by age 14.

8) The following information is available about the distribution of the price of single family homes in an area:

Median = $200,000 Mean = $250,000 Standard deviation = $150,000

If possible answer the following questions, if not possible, give your reason.

a. (1 point) Is the distribution symmetric? Why?

b. (1 point) The probability that price of a randomly selected single-family homes being less than $200,000?

c. (3 points) The probability that average price of randomly selected 4 single-family homes being between $100,000 and 400,000?

d. (4 points) The probability that average price of 100 single-family homes being between $220,000 and $280,000?

9) Scores on a certain nationwide college entrance examination follow a normal distribution with a mean of 500 and a standard deviation of 100.

a) (3 points) If school only admits students who score over 670, what proportion of the student pool would be eligible for admission?

b) (4 points) What should be the limit if only the top 15% are to be eligible?