Prince Sultan University
STAT 101
Final Examination
First Semester 2013/2014, Term 131
Saturday, 4th January 2014
Dr. Bahha Eldin Abdalla & Dr. Jose Catapang

Time Allowed: 120 minutes
Maximum points: 40 points

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

ID Number: _____   **Section:**_____

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

Problem	Max points	Student's Points
1	15	
2,3,4	8	
5	7	
6	6	
7	4	
Total	**40**	

Q1 (15 points) Complete the following statements with the best answer.

  a) The symbol for the population standard deviation is _____

  b) If the mode is to the left of the median and the mean is to the right of the median, then the distribution is _____ skewed.

  c) The five-number summary is: _____, _____, _____, _____, _____.

  d) When data are categorized as, for example, places of residence (rural, suburban, urban), the most appropriate measure of central tendency is the _____.

  e) A statistic that tells the number of standard deviations a data value is above or below the mean is called _____.

  f) The sample space for tossing 5 coins consists of _____ outcomes.

  g) The set of all possible outcomes of a probability experiment is called the _____.

  h) When two events cannot occur at the same time, they are said to be _____.

  i) When two dice are rolled, the probability of getting a sum of 6 is _____.

  j) A committee of 4 people can be selected from a group of 12 people in _____ ways.

  k) In a binomial experiment, if $n = 100$ and $q = 0.1$, then the variance is _____.

  l) If 5 cards are drawn from a deck, then the probability that 2 will be hearts is _____.

  m) If approximately 3% of the people in a room of 200 people are left-handed, then the probability that exactly 5 people are left handed is _____.

  n) If a die is rolled 480 times, then the expected number of 3s that will be rolled is _____.

  o) If x has a discrete probability distribution, $\sigma^2 = 2.75$ and $\sum x^2 P(x) = 15$, then the mean is _____.

Q2 (3 points) Given $P(A) = 0.4$, $P(B) = 0.6$, and $P(A \cap B) = 0.2$, find:

a) $P(A \cup B)$

b) $P(A|B)$

c) Are events A and B independent? Why?

Q3 (3 points) Twelve batteries were tested to see how many hours they would last. The frequency distribution is given. Find the variance and comment on the shape of the distribution.

Hours	Frequency
1 − 3	4
4 − 6	6
7 − 9	1
10 − 12	0
13 − 15	1

Q4 (2 points) Let x be a random variable with the following probability distribution:

x	−1	0	1	2
$P(x)$	0.2	0.25	b	0.15

Find μ and calculate $P(-\mu < x < \mu)$.

Q5 (7 points) The probability of winning on a slot machine is 5%. If a person plays the machine 500 times, **use the normal approximation** to find the following.

a) The probability of *winning exactly* 30 times.

b) The probability of *winning at most* 40 times.

c) The probability of *losing at least* 470 times.

Q6 (6 points) The average cost of repairing an iPod is $120 with a standard deviation of $10.5. The costs are normally distributed.

    a) Find the cost in dollars that represents the 80th percentile.

    b) If 15% of the costs are considered excessive, find the cost in dollars that would be considered excessive.

    c) Find the limits for the middle 80% of the costs.

Q7 *(4 points)* A survey found that the American family generates an average of 17.2 pounds of glass garbage each year. Assume the standard deviation of the distribution is 2.5 pounds.

    a) Find the probability that the mean of a sample of 55 families will be between 17 and 18 pounds.

    b) Find the probability that the mean of a sample of 100 families will exceed 18 pounds.

Good-Luck