**Prince Sultan University**
**STAT 101**
**Final Examination**
**First Semester 2012-2013, Term 121**
**Saturday, January 5th, 2013**
*Dr. Bahaa El-din Abdalla and Dr. Khaled Manasrah*

**Time Allowed: 120 minutes**
*Maximum points: 40 points*
**Name: _____ _____ _____ ID Number: _____**
(First) (Middle) (Last)
**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.* 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 **10** problems, some with several parts. Make sure that your paper has all these problems.

| Problem | Max Points | Points Earned |
|---------|-----------|---------------|
| 1, 2 | 9 | |
| 3, 4, 5 | 10 | |
| 6, 7 | 9 | |
| 8, 9, 10 | 12 | |
| Total | 40 | |

1) The following summary statistics were obtained from a data set.

$\bar{x} = 80.5$           median=84.0           $s = 10.5$

$Q_1 = 75.5$           Q3=96.0

Approximately what proportion of the observations are

a) (1 pt) Below 96.0?

b) (1 pt) Above 84.0?

c) (1.5 pts) In the interval 75.5-96.0?

d) (1.5 pts) In the interval 49.0-112.0?

State which of your answers are based on the assumption of a bell-shaped distribution.

2) The distribution of the number of errors that 10 students made on a typing an article is shown.

| Errors | Frequency |
|--------|-----------|
| 0-2 | 1 |
| 3-5 | 3 |
| 6-8 | 4 |
| 9-11 | 1 |
| 12-14 | 1 |

Find the following

a) (1 pt) Mean

b) (1 pt) Model class

c) (2 pts) Standard deviation.

3) Approximately 11% of the civilian population are veterans. Choose 5 civilians at random.

   a) (2 pts) What is the probability that none are veterans?

   b) (2 pts) What is the probability that at least 1 is a veteran?

4) (2 pts) How many ways can a dinner patron select 3 appetizers and 2 vegetables if there are 6 appetizers and 5 vegetables on the menu?

5) A student takes a 10-question, multiple-choice exam with three choices for each question and guesses on each question.

   a) (1 pt) Find the probability of guessing exactly 4 out of 10 correctly.

   b) (2 pts) Find the probability of guessing either a one or a two correctly.

   c) (1 pt) Find the mean for the number of correct answers, if a student guesses on each question

6) The probability distribution for the random variable X is given in the following table.

| X | 0 | 1 | 2 | 3 | 4 |
|------|-----|-----|-----|-----|-----|
| P(X) | .1 | .3 | .3 | ? | .1 |

a) (1 pt) Find P(3)

b) (1 pt) Find P(x> 2)

c) (2 pts) Find the standard deviation for this probability distribution.

7) The length of human pregnancies from conception to birth varies according to a distribution that is approximately normal with mean 266 days and standard deviation 16 days.

a) (2 pts) What is the percentage of the pregnancies that last between 246 days and 274 days?

b) (3 pts) How long do the longest 1% of human pregnancies last?

8) Assume that $A$ and $B$ are independent, $P(A) = 0.3$ and $P(B) = 0.5$. Find

   a) (1 pt) $P(A|B)$

   b) (1 pt) $P(A \cap B)$

   c) (1 pt) Are $A$ and $B$ mutually exclusive? Explain.

9) The heights of male students at PSU are normally distributed with mean 70 inches and standard deviation 2.8 inches.

   a) (2 pts) If male student is randomly selected, what is the probability that the height of the student will be greater than 72 inches?

   b) (3 pts) If 5 male students are randomly selected to make up a basketball team, what is the probability that the height of the team will average over 72 inches?

10) (4 pts) 53% of U.S. households have a personal computer. In a random sample of 250 households, what is the probability that fewer than 120 have a personal computer?