Stats 2B03 Test #1 (Version 1)
October 27th, 2010

Name:_____
(Last Name) (First Name)

Student Number:_____

Day Class
Duration: 75 Minutes **Instructors:** Childs, Sarr, Volterman
Maximum Mark: 21

This test paper consists of 20 multiple choice questions worth 1 mark each, and one question worth 1 mark on proper computer card filling. Marks will NOT be deducted for wrong answers (i.e., there is no penalty for guessing). QUESTIONS MUST BE ANSWERED ON THE COMPUTER CARD with an HB PENCIL. Answer all questions. You are responsible for ensuring that your copy of this paper is complete. Bring any discrepancy to the attention of your invigilator. Only the McMaster standard Calculator Casio fx-991 is allowed.

1. Glaucoma is a disease of the eye that is manifested by high intraocular pressure. The distribution of intraocular pressure in the general population is approximately normal with mean 16 mm Hg and standard deviation 3 mm Hg.
What percentage of the general population have an intraocular pressure that is between 15 and 18 mm Hg?
(a) .4017 **(b)** .4361 **(c)** .2987 **(d)** .3567 **(e)** .3779

2. A study of 100 apple trees showed that the average number of apples per tree was 1000. The standard deviation of the population is 150. Which of the following is the 98% confidence interval for the mean number of apples for all trees?
(a) (970.6, 1029.4) **(b)** (975.6, 1025.3) **(c)** (965.1, 1034.9) **(d)** (961.4, 1038.6)
(e) (961.6, 1038.4)

3. You have been hired to do market research, and you must estimate the percentage of households in which at least one plant is being grown. How many households must you survey if you want to be 94% confident that your sample percentage has a margin of error of three percentage points?
(a) 853 **(b)** 787 **(c)** 982 **(d)** 1068 **(e)** 652

4. Approximately 5% of children develop chronic bronchitis in the first year of life. In a group of 20 children, find the probability that exactly 2 of them develop chronic bronchitis in the first year of life.
(a) .1367 **(b)** .2376 **(c)** .1642 **(d)** .1887 **(e)** .2115

5. Systolic blood pressure readings were taken from 11 randomly selected people who have been recently diagnosed with hypertension, and are given below.

127, 128, 128, 129, 111, 136, 145, 163, 132, 138, 129

Which of the below stem and leaf plots is a correct stem and leaf plot for this data?

(a)
```
Stem-and-leaf of Systolic N=11
Leaf Unit = 1.0

 1   11  1
 6   12  78899
(3)  13  268
 2   14  5
 1   15
 1   16  3
```

(b)
```
Stem-and-leaf of Systolic N=11
Leaf Unit = 1.0

 1   11  1
(5)  12  78899
 3   13  268
 1   14  5
 0   15
 1   16  3
```

(c)
```
Stem-and-leaf of Systolic N=11
Leaf Unit = 1.0

 1   11  1
 5   12  78899
(3)  13  268
 1   14  5
 0   15
 1   16  3
```

(d)
```
Stem-and-leaf of Systolic N=11
Leaf Unit = 1.0

 1   11  1
(5)  12  78899
 5   13  268
 2   14  5
 1   15
 1   16  3
```

(e)
```
Stem-and-leaf of Systolic N=11
Leaf Unit = 1.0

 1   11  1
(5)  12  78899
 5   13  268
 2   14  56
 1   15
 1   16  3
```

6. Suppose that the cholesterol values for a certain population are approximately normally distributed with mean 200 and standard deviation 20. Fill in the blank. 90% of the population have cholesterol values greater than _____.

(a) 171.3 **(b)** 183.1 **(c)** 165.3 **(d)** 151.4 **(e)** 174.4

7. In order to estimate the average weight of a certain breed of dog, a researcher takes a sample of 52 dogs of that breed and produces the following confidence interval `(34.7524, 37.5876)`. The sample standard deviation was 6.215. What is the level of confidence?

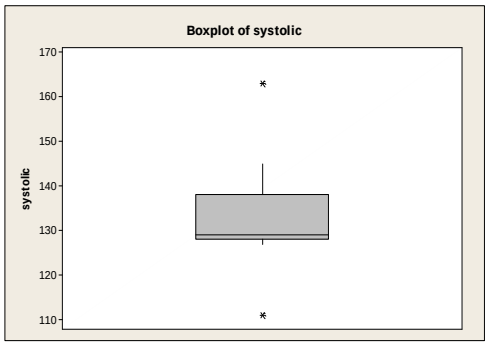
(a) 95% **(b)** 93% **(c)** 90% **(d)** 97% **(e)** 99%

8. Systolic blood pressure readings were taken from 11 randomly selected people who have been recently diagnosed with hypertension, and are given below.

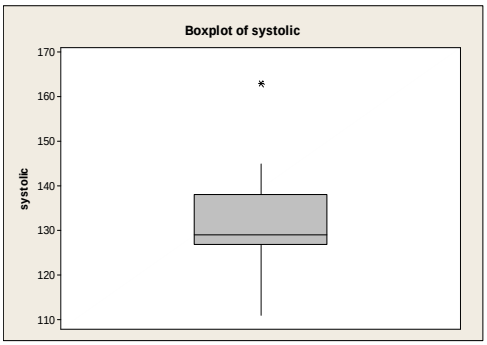
127, 128, 128, 129, 111, 136, 145, 163, 132, 138, 129

Which of the below boxplots is a correct modified boxplot for this data set?

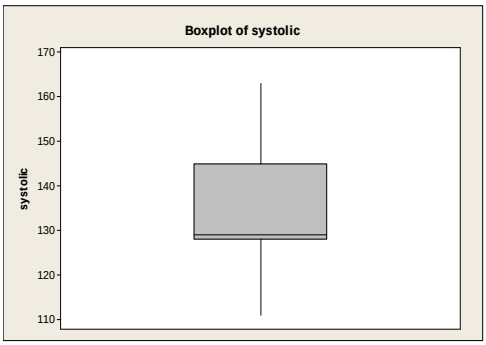
(a)



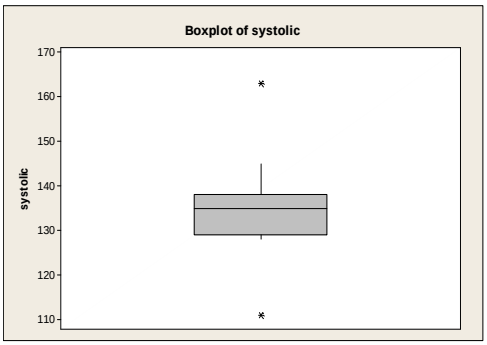
(b)



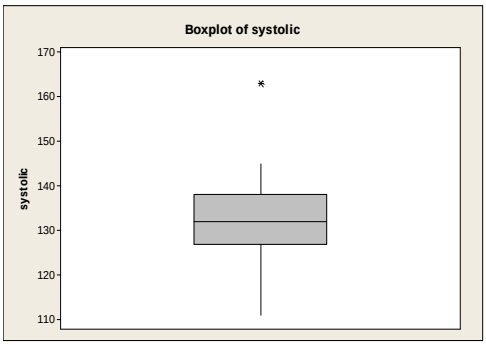
(c)



(d)



(e)



9. Assume that the number of episodes per year of otitis media, a common disease of the middle ear in early childhood, follows a Poisson distribution with an average of 1.6 episodes per year. Find the probability of getting at least one episode of otitis media in the first year of life.

(a) .2029 **(b)** .7981 **(c)** .3230 **(d)** .2584 **(e)** .7416

10. A data set with $n = 12$ observations has a sample mean of $\overline{x} = 17.2$. Suppose that a new data value of 9.7 is now *added* to the data set. What is the value of $\overline{x}$ for this new sample?

(a) 16.291 **(b)** 16.971 **(c)** 15.862 **(d)** 18.008 **(e)** 16.623

11. Three people are selected at random from a group of 20 men and 25 women, to participate in an exercise study. Find the probability that exactly two of them are men.
(a) 0.3347 **(b)** .3112 **(c)** .1116 **(d)** .2109 **(e)** .3292

12. The following table is a cross-tabulation table from the Birth data set that counts the mothers in the classifications of whether the baby was premature or not (`premie`, `0` = infant was not premature, `1` = infant was premature) and whether the mother admitted to smoking during pregnancy or not (`smoke`, `0` = mother did not smoke during pregnancy, `1` = mother did smoke during pregnancy).

```
Tabulated statistics: premie, smoke

Rows: premie   Columns: smoke

          0    1  Missing  All

0       606   99        2  705
1        78   15        0   93
All     684  114        *  798

Cell Contents:      Count
```

If a mother is randomly selected, find the probability that the mother smoked during pregnancy, given that the mother had a premature baby. (Ignore the `Missing` column altogether, and only use the data from the remaining 798 women, since the smoking status of 2 of the women was not known.)
(a) .0188 **(b)** .1613 **(c)** .2406 **(d)** .0166 **(e)** .2981

13. The Genetics and IVF Institute conducted a clinical trial of the YSORT method designed to increase the probability of conceiving a boy. 51 babies were born to parents using the YSORT method, and 39 of them were boys. Construct a 99% confidence interval estimate of the percentage of boys born to parents using the YSORT method.
(a) (0.612, 0.918) **(b)** (0.648, 0.881) **(c)** (0.667, 0.862) **(d)** (0.636, 0.894)
(e) (0.657, 0.872)

14. The following table is a cross-tabulation table from the Birth data set that counts the mothers in the classifications of whether the baby was premature or not (`premie`, `0` = infant was not premature, `1` = infant was premature) and whether the mother admitted to smoking during pregnancy or not (`smoke`, `0` = mother did not smoke during pregnancy, `1` = mother did smoke during pregnancy).

```
Tabulated statistics: premie, smoke

Rows: premie   Columns: smoke

          0    1  Missing  All

0       606   99        2  705
1        78   15        0   93
All     684  114        *  798

Cell Contents:      Count
```

If a mother is randomly selected, find the probability that the mother smoked during pregnancy or the mother had a premature baby. (Ignore the `Missing` column altogether, and only use the data from the remaining 798 women, since the smoking status of 2 of the women was not known.)

(a) .1316 **(b)** .0188 **(c)** .2594 **(d)** .2406 **(e)** .2187

15. A statistics class has 2 sections. The final marks are summarized in the Minitab output below. Fill in the blank. Approximately _____ (how many?) of the students in Section 2 (C02) got a mark higher than 81?

```
Descriptive Statistics: Marks

Variable  Section    N  N*    Mean  SE Mean   StDev  Minimum      Q1  Median
Marks     C01      230   0   70.70     1.12   16.98    26.00   59.00   72.00
          C02      373   0  68.861    0.855  16.509    25.00   57.00   69.00

Variable  Section      Q3  Maximum
Marks     C01       85.00   100.00
          C02       81.00   100.00
```

(a) 280 **(b)** 93 **(c)** 107 **(d)** 78 **(e)** 124

16. A random sample of squirrels had the following weights (in ounces),

$$12.3,\ 8.7,\ 5.2,\ 7.6,\ 10.5$$

Find a 90% confidence interval of the true mean weight of all squirrels. Assume that the weights of squirrels are normally distributed.

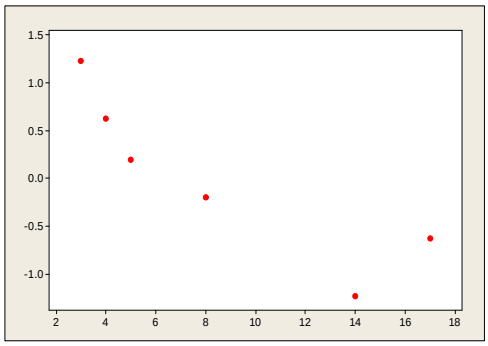
(a) (3.265, 14.455) **(b)** (6.861, 10.859) **(c)** (5.486, 12.234) **(d)** (6.269, 11.451)
(e) (6.478, 11.242)

17. Consider the following data set,

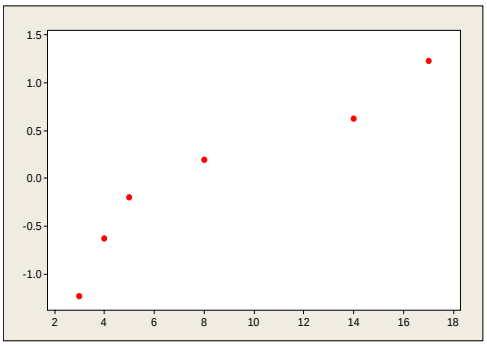
$$14, 17, 8, 5, 4, 3$$

Which of the below plots is a correct normal probability plot for this data set?

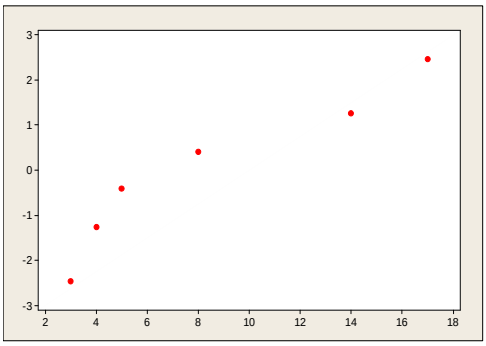
(a)



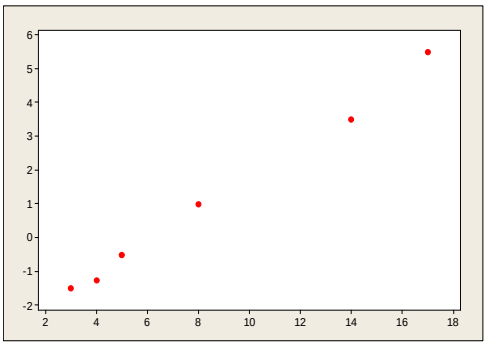
(b)



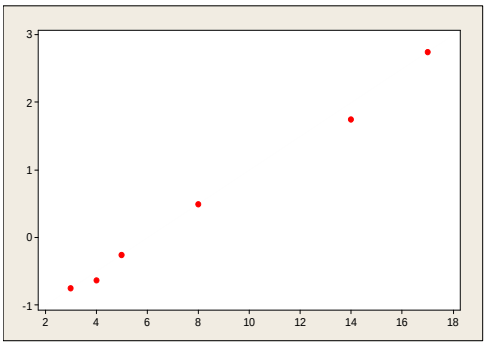
(c)



(d)



(e)



18. The average age of doctors in a certain hospital is 48.0 years old with a standard deviation of 6.0 years. If 42 doctors are chosen at random for a committee, find the probability that the mean age of those doctors is between 46.5 and 51.2 years.
(a) .9471 **(b)** .3526 **(c)** .2967 **(d)** .5945 **(e)** .6493

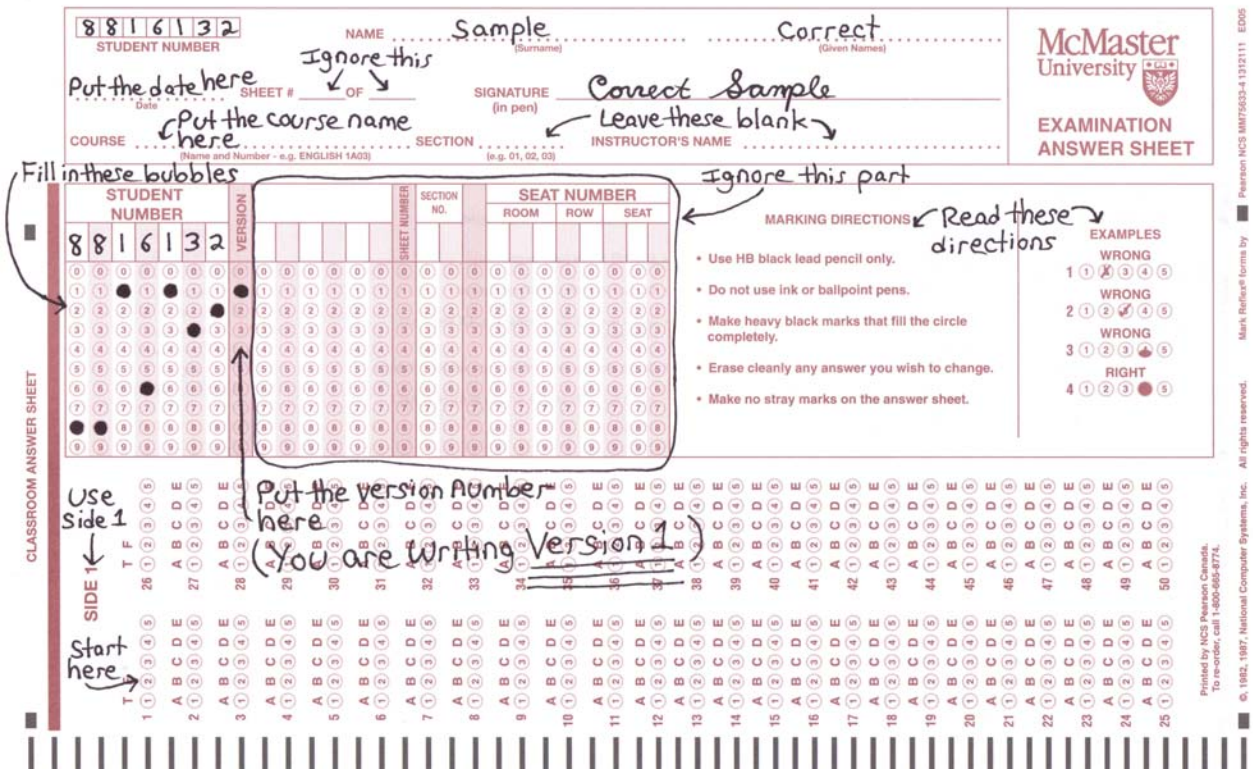
19. Marks on a test in a large introductory stats course are summarized in the Minitab output below. How many students got a mark of at least 60% but less than 80%?

```
Stem-and-Leaf Display: C2

Stem-and-leaf of C2  N  = 1325
Leaf Unit = 1.0

 1      3   5
 25     4   2344555666777888888999999
 203    5   000000000111111222222222222222222233333333333444444444444444444445+
(468)   6   000000000000000000000000000000000000000000000000011111111111111111+
 654    7   000000000000000000000000000000000000000000000000000011111111111111+
 215    8   000000000000000000000000011111111111111111111111111111122222222222+
 25     9   000011112333344445667 78
 2      10  00
```

(a) 468 **(b)** 907 **(c)** 1122 **(d)** 439 **(e)** 785

20. Let z be a standard normal random variable. Find the value of z_1 so that $P(z_1 \leq z \leq 2.98) = .1117$.
(a) 1.09 **(b)** 1.17 **(c)** 1.21 **(d)** 1.28 **(e)** 1.35

21. Correctly fill out the bubbles corresponding to your student number and the version number of your test in the correct places on the computer card.
Hint:



Answers (Version 1)**:**

1. e **2.** c **3.** c **4.** d **5.** d **6.** e **7.** c **8.** a **9.** b **10.** e
11. a **12.** b **13.** a **14.** d **15.** b **16.** d **17.** b **18.** a **19.** b **20.** c