Stats 2B03 Test #1 (Version 4)
October 26th, 2009

Name:_____ **Student Number:**_____
(Last Name) (First Name)

Day Class
Duration: 75 Minutes **Instructor:** Childs, Zhu
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. A medical researcher wants to estimate the percentage of all females who take vitamins. He wishes to be 98% confident that the estimate is within 4 percentage points of the true proportion. What is the minimum sample size needed?
(a) 849 **(b)** 983 **(c)** 1697 **(d)** 1201 **(e)** 601

2. Let z denote a standard normal random variable. Find z_1 such that $P(-z_1 < z < z_1) = .4538$.
(a) 1.27 **(b)** .60 **(c)** 1.14 **(d)** .12 **(e)** .38

3. An average of 4 patients are admitted in a certain hospital emergency room each hour. Assuming that the number of admittances follows a Poisson distribution, find the probability that at least 2 people will be admitted in the next hour.
(a) .9084 **(b)** .7619 **(c)** .2381 **(d)** .0916 **(e)** .8439

4. In order to estimate the average weight of a certain breed of dog, a researcher takes a sample of 45 dogs of that breed and produces the following 93% confidence interval `(26.6825, 29.5175)`. Find the sample standard deviation.

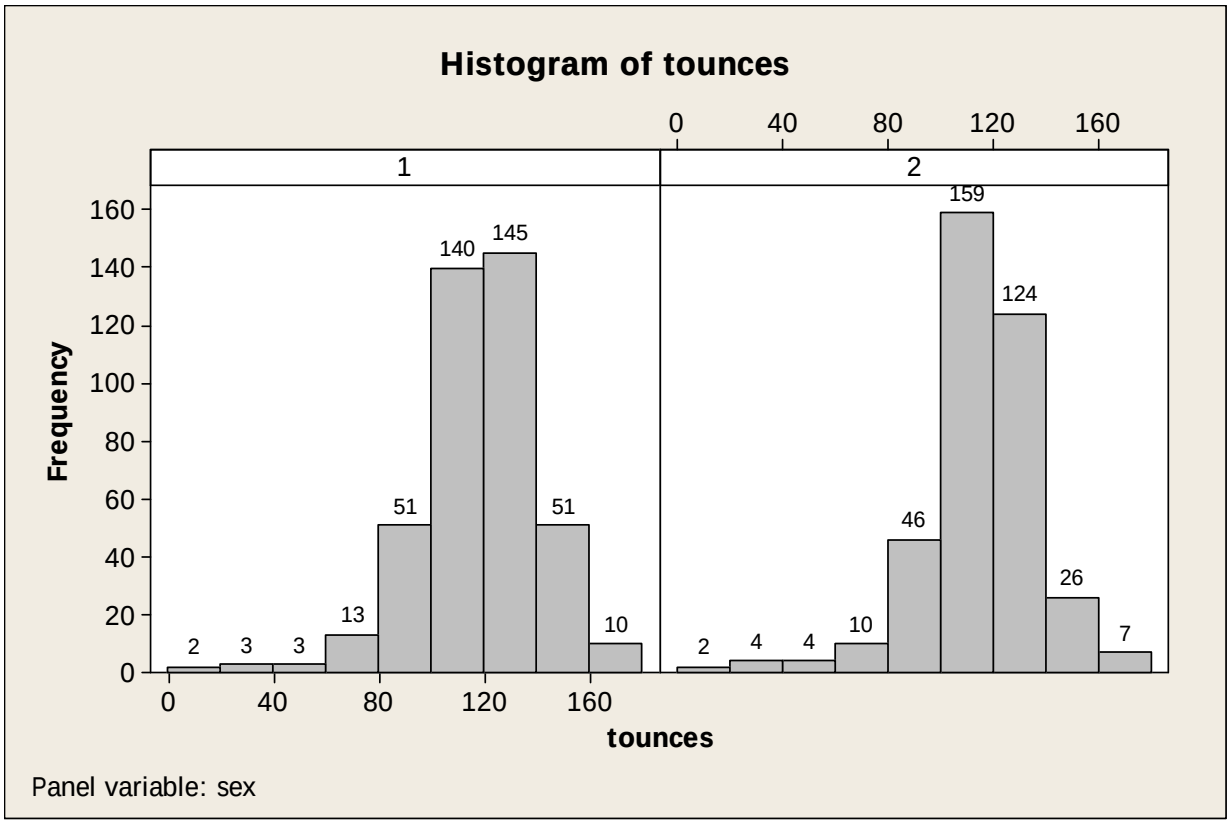
(a) 4.23 **(b)** 5.25 **(c)** 4.97 **(d)** 5.61 **(e)** 6.23

5. Consider the following data set,

$$1, 5, 25, 28, 32, 34, 37, 68, 84$$

How many outliers are there?
(a) 1 **(b)** 2 **(c)** 0 **(d)** 3 **(e)** 4

6. Consider the Minitab output below which gives histograms for the weights of 800 newborn babies in ounces for children born 1 = male, and 2 = female. If a baby is selected at random from the 800, find the probability that the baby is male, or weighs at least 160 ounces.



(a) .4552 **(b)** .4963 **(c)** .5217 **(d)** .5313 **(e)** .5438

7. 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 for the true mean weight of all squirrels.
(a) (3.265, 14.455) **(b)** (5.486, 12.234) **(c)** (6.861, 10.859) **(d)** (6.478, 11.242)
(e) (6.269, 11.451)

8. Suppose that marks on a test are normally distributed with standard deviation $\sigma = 15$. If 10% of the class failed (i.e., got a mark less than 50), find the mean μ.
(a) 54.9 **(b)** 73.6 **(c)** 69.2 **(d)** 68.7 **(e)** 71.4

9. Consider the below variables from the Birth data set. Which of these variables is measured on the ordinal scale?

`sex`	Sex of child ($1 =$ male, $2 =$ female)
`marital`	Marital status ($1 =$ married, $2 =$ not married)
`hispmom`	Mother of Hispanic origin (C = Cuban, M = Mexican, N = Non-Hispanic, O = other and unknown Hispanic, P = Puerto Rican, S = Central/South American, U = not classifiable
`smoke`	$0 =$ mother did not smoke during pregnancy $1 =$ mother did smoke during pregnancy
`drink`	$0 =$ mother did not consume alcohol during pregnancy $1 =$ mother did consume alcohol during pregnancy
`low`	$0 =$ infant was not low birth weight $1 =$ infant was low birth weight
`premie`	$0 =$ infant was not premature $1 =$ infant was premature Premature defined as 36 weeks or sooner

(a) `sex, marital, hispmom` **(b)** `hispmom, marital, low` **(c)** `smoke, drink, low, premie` **(d)** all of them **(e)** none of them

10. Consider the Minitab output below which is a stem-and-leaf plot for the weights of 800 newborn babies in pounds. Find the missing depth in the 9th row of the plot.

```
Stem-and-Leaf Display: tpounds

Stem-and-leaf of tpounds  N  = 800
Leaf Unit = 0.10


 1     0   7
 7     1   001246
 12    2   00235
 20    3   01334588
 41    4   001223555666678889 99
 108   5   000111112222333333333444555555556666777788888888888888888888999999+
 278   6   000000000000011111111111111111222222223333333333333333444444444455+
(284)  7   000000000000000000000000000000000000000011111111111111111111111111+
  ?    8   000000000000000000000000000011111111111111111111112222222233333 3+
 73    9   000000000000011111111112222222222333333445555666688888
 17    10  00000011123333345
```

(a) 238 **(b)** 138 **(c)** 254 **(d)** 187 **(e)** 225

11. Consider the Minitab output given below. Find the value of $?_1$ (the missing value in the 5th row of the last column of output.)

```
Tally for Discrete Variables: codedmage

codedmage  Count  Percent  CumPct
  015-018     60     7.50    ?
  019-022    165    20.63    ?
  023-026     ?        ?     ?
  027-030    152    19.00    ?
  031-034    148    18.50    ?1
  035-038     73     9.13    ?
  039-042     25     3.13    ?
       N=    800
```

(a) 65.11 **(b)** 87.76 **(c)** 71.52 **(d)** 78.51 **(e)** 82.98

12. Which of the following is a correct stem-and-leaf plot?

(a)
```
Stem-and-leaf of Data  N  = 13
Leaf Unit = 1.0

 7   2  1133356
(4)  3  0359
 2   4  1
 1   5  9
```

(b)
```
Stem-and-leaf of Data  N  = 13
Leaf Unit = 1.0

(7)  2  1133356
 6   3  0359
 2   4  1
 1   5  9
```

(c)
```
Stem-and-leaf of Data  N  = 13
Leaf Unit = 1.0

 7   2  1133356
11   3  0359
(1)  4  1
 1   5  9
```

(d)
```
Stem-and-leaf of Data  N  = 13
Leaf Unit = 1.0

 7  2  1133356
(4) 3  0359
 1   4  1
 1   5  9
```

(e)
```
Stem-and-leaf of Data  N  = 13
Leaf Unit = 1.0

 7   2  1133356
 4   3  0359
(1)  4  1
 1   5  9
```

13. A statistics class has 2 sections. The final marks are summarized in the Minitab output below. Fill in the blank. Approximately 25% of the students in Section 1 (C01) got a mark higher than _____ ?

```
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) 52 **(b)** 26 **(c)** 59 **(d)** 85 **(e)** 72

14. Find the probability that a family of 4 children consists of 2 boys and 2 girls.
(a) .625 **(b)** .125 **(c)** 0.5 **(d)** .25 **(e)** .375

15. Suppose that 15% of the population is left-handed. If 20 people are selected at random, find the probability that exactly 4 of them are left-handed.
(a) .4298 **(b)** .4871 **(c)** .3543 **(d)** .1821 **(e)** .2667

16. Two people are selected at random from a group of 8 men and 5 women to participate in an exercise study. Find the probability that at least one of the people selected is a woman.
(a) .7436 **(b)** .2564 **(c)** .8718 **(d)** .1282 **(e)** .6410

17. Marks for a statistics class with two sections are summarized in the cross-tabulation table below which counts the number of people in each Section (`C01`, `C02`) according to whether they passed or failed (1 = passed, `0` = failed). If a student is selected at random, find the probability that they failed and were in Section 2 (`C02`).

```
Tabulated statistics: Section, pass

Rows: Section   Columns: pass

         0    1  All

C01     32  198  230
C02     50  323  373
All     82  521  603

Cell Contents:      Count
```

(a) .1721 **(b)** .6716 **(c)** .0829 **(d)** .0841 **(e)** .1340

18. Marks for a statistics class with two sections are summarized in the cross-tabulation table below which counts the number of people in each Section (`C01`, `C02`) according to whether they passed or failed (1 = passed, `0` = failed). If a student is selected at random, find the probability that they were in Section 1 (`C01`), given that they passed.

```
Tabulated statistics: Section, pass

Rows: Section   Columns: pass

         0    1  All

C01     32  198  230
C02     50  323  373
All     82  521  603

Cell Contents:      Count
```

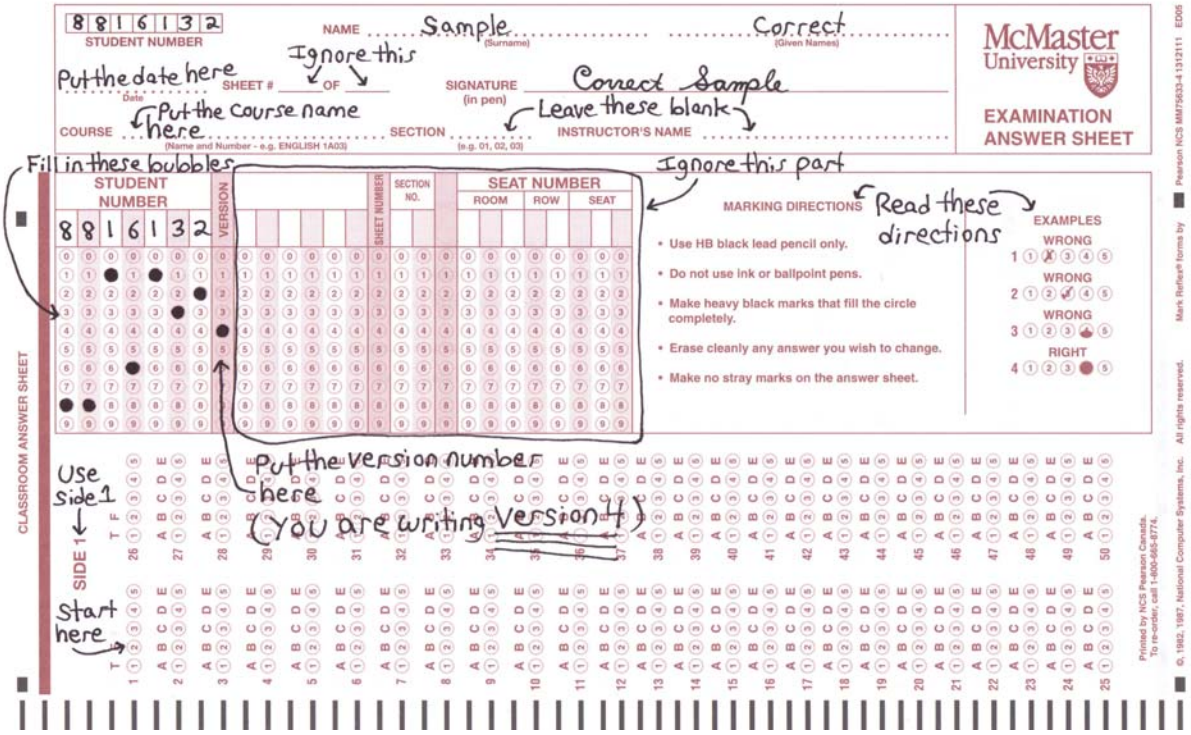
(a) .3447 **(b)** .3800 **(c)** .3284 **(d)** .3296 **(e)** .3902

19. 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. If a person is selected at random, find the probability that their intraocular pressure is greater than 18 mm Hg.
(a) .2514 **(b)** .7486 **(c)** .7514 **(d)** .2486 **(e)** .3567

20. IQs are known to be normally distributed with mean 100 and standard deviation 15. If a sample of 43 people is randomly selected, find the probability that the sample mean IQ will be between 97 and 102.
(a) .8638 **(b)** .6551 **(c)** .8815 **(d)** .7127 **(e)** .6843

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 4)**:**

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