Math 54   Test #1 (Chapter 1, 2, 3)   Name_____

Show all work neatly and systematically for full credit.   Time: 75 minutes.   Total points: 101

(4) **Classify the variable as qualitative or quantitative.**
    1) (a). the numbers on the shirts of a boy's
        football team

    (b). The weights of a textbook.

(4) **Determine whether the quantitative variable is discrete or continuous.**
    2) (a). the speed of a car on a Boston tollway
        during rush hour traffic

    (b). The number of pills in an aspirin bottle.

(6) **Determine the level of measurement (Nominal, Ordinal, Interval, or Ratio) of the variable.**
    3) (a). the musical instrument played by a music
        student

    (b). Height of a tree.

    (c). The day of the month

(4) **Determine whether the study depicts an observational study or an experiment.**
    4) (a). A poll is conducted in which professional
        musicians are asked their ages.

    (b). The personnel director at a large company
    would like to determine whether the company
    cafeteria is widely used by employees. She
    calls each employee and asks them whether
    they usually bring their own lunch, eat at the
    compnay cafeteria, or go out for lunch.

(6) **Identify the type of sampling used (Stratified, Random, Cluster, Convenience, or Systematic).**
    5) (a). Every fifth adult entering an airport is
        checked for extra security screening. What
        sampling technique is used?

    (b). A travel industry researcher interviews all
    of the passengers on five randomly selected
    cruises. What sampling technique is used?

    (c). A lobbyist for the oil industry assigns a
    number to each senator and then uses a
    computer to randomly generate ten numbers.
    The lobbyist contacts the senators
    corresponding to these numbers. What
    sampling technique was used?

Provide an appropriate response.
    6) (5) The weights (in pounds) of babies born at St
        Mary's hospital last month are summarized in
        the table.

Weight (lb)	Number of Babies
5.0 – 5.8	5
5.9 – 6.7	19
6.8 – 7.6	18
7.7 – 8.5	9
8.6 – 9.4	4

Construct a frequency histogram .

7) (1,1,1,1,2) Given the frequency table below.

Class	Frequency
35–36	3
37–38	1
39–40	3
41–42	6
43–44	2

a. Find the class width for the frequency table.

b. Determine the class boundaries of the second class.

c. Find the relative frequency of the fourth class.

d. Find the midpoint of the first class.

e. Find the mean.

(2, 3) Given the Stemplot below.

8)

Stem	Leaves
7	5
8	3
9	0 2
10	6
11	6 7
12	6 9
13	6 7 9
14	2 3 8 9
15	8 9

Legend: 5|5 represents 55

a. What does the stemplot reveal about the distribution of the data?

a. Determine the original data set.

(6) **Construct the requested frequency distribution.**

9) The March utility bills (in dollars) of 30 homeowners are listed below.

44 38 41 50 36 36 43 42 49 48
35 40 37 41 43 50 45 45 39 38
50 41 47 36 35 40 42 43 48 33

Construct a frequency distribution using five classes and using 33 as the lower class limit of the first class.

Provide an appropriate response.

10) (7) The costs (in dollars) of 10 college math textbooks are listed below.

70 72 71 70 69 73 69 68 70 71

a. Find the sample mean.

b. Find the sample standard deviation.

c. Find the median.

d. Find the mode.

e. Find the range.

f. Find the sample variance.

g. Find the midrange.

11) (6) At a tennis tournament a statistician keeps track of every serve. The statistician reported that the mean serve speed of a particular player was 97 miles per hour (mph) and the standard deviation of the serve speeds was 11 mph.

(a). Assume that the statistician also gave us the information that the distribution of the serve speeds was **bell shaped**. What proportion of the player's serves are expected to be between 64 mph and 130 mph?

(b). If the distribution of the data is **unknown**, what proportion of the player's serves are expected to be between 64 mph and 130 mph?

12) (5) A student receives test scores of 52, 83, and 91. The student's term project score is 88. Each test is worth 20% of the final grade, the term project is 25% of the final grade. What is the student's mean score in the class before the final? (Note that the total weight is not 100%)

13) (3) Find the z–score for the value 84, when the mean is 74 and the standard deviation is 4.

14) (4) Test scores for a statistics class had a mean of 79 with a standard deviation of 4.5. Suppose a student gets a 94 on the statistics test , calculate the z–score for the test. Then determine whether it is unusual to have a score of 94, explain

15) (6) The commute times (in minutes) of 30 employees are listed below.

13 34 45 48 52 55 56 56 63 65
67 67 69 70 70 74 75 78 79 79
80 81 83 85 85 87 90 92 95 109

(a). Find Q_1, Q_2, and Q_3.

(b). Find outliers, if any. You need to show work (Show fences and make decision).

16) **(5) Notations.** Write the symbol for the following:

a. Sample mean:

b. Sample Size.

c. Sample standard deviation.

d. Population mean.

e. Population standard deviation.

Provide an appropriate response.

17) (2, 2, 5) The following is a sample of 19 November utility bills (in dollars) from a neighborhood.
52, 62, 66, 68, 72, 74, 76, 76, 76, 78, 78, 82, 84, 84, 86, 88, 92, 96, 110

a. Find the percentile for 72.

b. Find the 85th percentile, that is find P_{85}

b. Construct a modified box plot (Note: you need to find the upper fence, lower fance, then determine whether there is an outlier).

(4) Determine whether the underlined value is a parameter or a statistic.

18) (a) A study of 2700 college students in the city of Pemblington found that <u>14%</u> had been victims of violent crimes.

(b). <u>51.6%</u> of the residents of Garden City are female.

(6) Use the given data to construct a frequency distribution.

19) A school district performed a study to find the main causes leading to its students dropping out of school. Thirty cases were analyzed, and a primary cause was assigned to each case. The causes included unexcused absences (U), illness (I), family problems (F), and other causes (O). The results for the thirty cases are listed below:

    U U U I F O O U I F
    F O U I I F I I O U
    I F F U U I I O F U

a. Construct a frequency distribution of the primary causes leading to student dropout.

b. Construct a pareto chart.