Mth 102 – General Education Statistics – Practice Exam 1

NOTE: This exam should not be taken as a complete list of possible problems. It is merely intended to be an example of the length and difficulty level of the regular exam. To best utilize it as a *practice* exam, give yourself 55 minutes with no distractions. Try to emulate the classroom environment as much as possible.

1. Suppose we find the average age of students in this class is 20. Is this statistic *descriptive* or *inferential*? Justify your answer.

2. 65% of respondents in a 2005 poll of 1,000 American adults by Global Market Insite, Inc. stated that they "believe the Bush administration's response to Hurricane Katrina was unsatisfactory and more needs to be done, both regionally and nationally." An article presented by Google News went on to state that Hurricane Katrina has "left most Americans fearing the worst at the gas pump." Is this statistic *descriptive* or *inferential*? Justify your answer.

3. Suppose a math instructor teaches 5 courses: Statistics (S), Beginning Algebra (B), Intermediate Algebra (I), Trigonometry (T), and Calculus (C). The instructor is then instructed to randomly choose two classes to give a survey to. List the possible samples of two classes from this population of five classes. (Use the letters provided.)

4. A tax auditor has a pile of 191 tax returns of which she would like to select 17 for a special audit. Describe a method for selecting the sample which involves systematic random sampling.

5. A researcher wished to assess the importance of exercise in weight-loss programs. 412 people, all considered to be at least 20 pounds overweight, volunteered to participate in the study. The participants were randomly assigned to one of two groups. Over a two-month period, the first group followed a particular diet but were instructed to perform no exercise other than walking. The second group followed the same diet but also performed aerobic exercise for one hour each day. At the end of the two months, the weight loss of each participant was recorded. Is this an *observational study* or a *designed experiment*? You must justify your answer to receive credit.

6. Suppose you wish to study the effects of attendance. You randomly assign 30 to attend every class meeting, and a second group of 30 to work on homework and study the material outside of class. Both groups will take the same exam and those scores will be compared.

    a. What is the response variable in this experiment?

    b. List four factors affecting the response variable. (Use your own judgement – these are not given.)

    c. What is the treatment?

7. Could this class of Mth 102 students be used as a representative sample of ECC students? Why or why not? You must justify your answer to receive credit.

8. Classify each variable as qualitative or quantitative.

    a. property value

    b. hair color

    c. vehicle weight

    d. monthly precipitation

    e. gender

9. Classify each quantitative variable as discrete or continuous.

    a. points scored in the Super Bowl

    b. number of full-time students at ECC

    c. volume of water in a reservoir

    d. shoe size

    e. time spent taking this exam

10. Identify the type of sampling (random, systematic, stratified, cluster, or convenience) used in each example. You must justify your answer to receive credit.

    a. The Quality Control Officer at an assembly line exams every 100^{th} unit for defects.

    b. To calculate the deer population in a state park, the park rangers separate the park into 100-yd square plots. They then randomly select 20 plots and count the number of deer in each plot.

11. The following data represent the region of birth of foreign-born residents of the United States in 2000.

Region	Number (in thousands)	Relative Frequency
Europe	4772	
Asia	8364	
Africa	840	
Oceania	180	
Latin America	15,472	
North America	836	

a. Construct a relative frequency distribution. (Use the provided table.)

b. Construct a frequency bar graph.

12. The following data represent the percentage of divorces (as a percentage of marriages in 1996) for selected countries. (Note that the values are already in decreasing order.)

68	65	64	63	63	61	56	56	55	53	52	49	46	45	43
43	41	41	40	39	39	38	35	34	28	26	26	25	24	21
19	18	18	18	17	15	15	13	13	12	12	12	7	6	5

Source: *Time Almanac*, 2000

a. Construct a frequency histogram with the first class having a lower class limit of 0 and a class width of 10. (You may first need to construct a frequency table.)

b. What is the distribution shape?

13. Using the previous set of data, construct a stem-and-leaf plot.