KING FAHD UNIVERSITY OF PETROLEUM & MINERALS
DEPARTMENT OF MATHEMATICS & STATISTICS
DHAHRAN, SAUDI ARABIA
STAT 211: BUSINESS STATISTICS I

Semester 151
Major Exam One
Monday September 14, 2015
Allowed time 90 minutes

Please **circle** your instructor name and section:

Instructor	**section number**
Esam Al-Sawie	1
Musawar Amin Malik	2

Name: Student ID#: Serial #:

Directions:

1) You must **show all work** to obtain full credit for questions on this exam.
2) **DO NOT round** your answers at each step. Round answers only if necessary at **your final step to 4 decimal places**.
3) You are allowed to use electronic calculators and other reasonable writing accessories that help write the exam. Try to define events, formulate problem and solve.
4) Do not keep your mobile with you during the exam, turn off your mobile and leave it aside

Question No	Full Marks	Marks Obtained
Q1	*10*	
Q2	*10*	
Q3	*25*	
Q4	*5*	
Total	*50*	

Q1. Multiple choices (0.5 point each).

1. Which of the following is not an element of descriptive statistical problem?
    a. An inference made about the population based on the sample.
    b. The population or sample of interest.
    c. Tables, graphs, or numerical summary tools.
    d. Identification of patterns in the data

2. Those methods involving the collection, presentation, and characterization of a set of data in order to properly describe the various features of that set of data are called
a. Statistical inference.
b. The scientific method.
c. Sampling.
d. Descriptive statistics

3. A summary measure that is computed to describe a characteristic from only a sample of the population is called
    a. A parameter.
    b. A census.
    c. A statistic.
    d. The scientific method.

4. How do you rate the quality of your business statistics course" is an example of

    a. Ratio
    b. Nominal
    c. Interval
    d. Ordinal

5. Jack was working on a project to look at global warming and accessed an Internet site where he captured average global surface temperatures from 1866. Which of the four methods of data collection was he using?
    a. Published sources
    b. Experimentation
    c. Surveying
    d. Observation

6. The Saudi Airlines Internet site provides a questionnaire instrument that can be answered electronically. Which of the 4 methods of data collection is involved when people complete the questionnaire?
        a. Published sources
        b. Experimentation
        c. Surveying
        d. Observation

7. Which of the following is a discrete quantitative variable?
    a. The Dow Jones Industrial average
    b. The volume of water released from a dam
    c. The distance you drove yesterday.
    d. The number of employees of an insurance company

8. Which of the following is a continuous quantitative variable?
    a. The color of a student's eyes
    b. The number of employees of an insurance company
    c. The amount of milk produced by a cow in one 24-hour period
    d. The number of gallons of milk sold at the local grocery store yesterday

9. The classification of student class designation (freshman, sophomore, junior, senior) is an example of
    a. A categorical random variable.
    b. A discrete random variable.
    c. A continuous random variable.
    d. A parameter.

10. The universe or "totality of items or things" under consideration is called
    a. A sample.
    b. A population.
    c. A parameter.
    d. A statistic.

11. A summary measure that is computed to describe a characteristic from only a sample of the population is called
    a. A parameter.
    b. A census.
    c. A statistic.
    d. The scientific method.

12. To monitor campus security, the campus police office is taking a survey of the number of students in a parking lot each 30 minutes of a 24-hour period with the goal of determining when patrols of the lot would serve the most students. If X is the number of students in the lot each period of time, then X is an example of
    a. A categorical random variable.
    b. A discrete random variable.
    c. A continuous random variable.
    d. A statistic.

13. Researchers are concerned that the weight of the average American school child is increasing implying, among other things, that children's clothing should be manufactured and marketed in larger sizes. If X is the weight of school children sampled in a nationwide study, then X is an example of
    a. A categorical random variable.
    b. A discrete random variable.
    c. A continuous random variable.
    d. A parameter.

The manager of the customer service division of a major consumer electronics company is interested in determining whether the customers who have purchased a videocassette recorder made by the company over the past 12 months are satisfied with their products. (For Q14 to Q20).

14. The population of interest is
    a. All the customers who have bought a videocassette recorder made by the company over the past 12 months.
    b. All the customers who have bought a videocassette recorder made by the company and brought it in for repair over the past 12 months.
    c. All the customers who have used a videocassette recorder over the past 12 months.
    d. All the customers who have ever bought a videocassette recorder made by the company.

15. The possible responses to the question "Are you happy, indifferent, or unhappy with the performance per dollar spent on the videocassette recorder?" are values from a
    a. Discrete numerical random variable.
    b. Continuous numerical random variable.
    c. Categorical random variable.
    d. Parameter.

16. The possible responses to the question "What is your annual income rounded to the nearest thousands?" are values from a
    a. Discrete numerical random variable.
    b. Continuous numerical random variable.
    c. Categorical random variable.
    d. Parameter.

17. The possible responses to the question "Out of a 100 point score with 100 being the highest and 0 being the lowest, what is your satisfaction level on the videocassette recorder that you purchased?" are values from a
    a. Discrete numerical random variable.
    b. Continuous numerical random variable.
    c. Categorical random variable.
    d. Parameter.

18. The possible responses to the question "In which year were you born?" are values from a
    a. Discrete numerical random variable.
    b. Continuous numerical random variable.
    c. Categorical random variable.
    d. Parameter.

19. The possible responses to the question "How much time do you use the videocassette recorder every week on the average?" result in
    a. A nominal scale variable.
    b. An ordinal scale variable.
    c. An interval scale variable.
    d. A ratio scale variable.

20. The possible responses to the question "How would you rate the quality of your purchase experience with 1 = excellent, 2 = good, 3 = decent, 4 = poor, 5 = terrible?" result in
    a. A nominal scale variable.
    b. An ordinal scale variable.
    c. An interval scale variable.
    d. A ratio scale variable.

Q2. (4+2+4 =10 points)

The number of defective items produced by a machine and recorded for the last 25 days are as follows:

19	6	15	20	17	16	17	12	15	29	23	17	7
10	14	14	27	22	8	5	23	19	9	28	5	

a. Construct a frequency distribution and a relative frequency distribution for these data. Use five class intervals, with the lower boundary of the first class being five items.
b. Construct a relative frequency histogram for these data.
c. Use the frequency distribution of part (a) to approximate the mean and standard deviation.

Q3. The data below represent the amount of grams of carbohydrates in a serving of breakfast cereal in a sample of 30 different servings.

0.02	0.15	0.19	0.47	0.71	1.02
1.04	1.05	1.09	1.16	1.17	1.23
2.38	2.40	2.66	2.66	2.74	2.81
2.86	2.91	3.19	3.27	3.53	3.76
3.85	4.25	4.39	4.75	5.25	5.30

Note: You may use the following summary and formula where ever you need.

$\sum x$ **= 72.26,** $\sum x^2$ **= 244.89,** $S = \sqrt{\frac{\sum\left(x - \bar{x}\right)^2}{n-1}} = \sqrt{\frac{\sum x^2 - \frac{\left(\sum x\right)^2}{n}}{n-1}}$

a. (2+1). Prepare a Stem-and-leaf plot of the sample, and comment.

b. (1+1+1+1). Find the mean and median, based on these values is the data skewed positively or negatively? Reason?

c. (1).What is the mode carbohydrates of the breakfast cereal?

d. (3+1). Compute the sample variance and standard deviation for the carbohydrates.

e. (2+2). Find the 25^{th} and 75^{th} percentiles and interpret these values.

f. (3+1). Draw a box plot and comment.

g. (1+1). Calculate coefficient of variation and comment on it.

h. (1+1+1). Calculate z-scores of the smallest and the largest observations in the sample and comment.

Q4. (2+2+1).
The following table presents total retail sales in percentage for the leading apparel companies during April 2001. Make a Pareto diagram and comment on the vital few and trivial many.

Apparel Company	**April 2001**
Gap	40.00%
TJX	30.92%
Limited	9.95%
Kohl's	8.57%
Nordstrom	4.77%
Talbots	3.74%
Ann Taylor	2.05%
Total	100.00%