KING FAHD UNIVERSITY OF PETROLEUM & MINERALS
DEPARTMENT OF MATHEMATICS AND STATISTICS
Term 162

STAT 211 BUSINESS STATISTICS I

Tuesday Match 28, 2017

Please circle your instructor's name:

W. Al- Sabah M. Saleh

Name: _____ ID #:_____

Important Note:

- Show all your work including formulas, intermediate steps and final answer

Question No	Full Marks	Marks Obtained
1	10	
2	5	
3	24	
4	12	
5	5	
6	4	
Total	60	

Q1: (*10 pts.*) For each of the following variables, write the data type and appropriate measurement level:

Data	Data type	Measurement level
a) Number of telephones per household		
b) Length (in minutes) of the longest telephone call made in a month		
c) Whether someone in the household owns a Wi-Fi-capable cell phone		
d) Whether there is a high-speed internet connection in the household		

Q2: (*5 pts.*) An order for an automobile can specify either an automatic or a standard transmission, either with or without air conditioning, and with any one of the three colors red, blue, or white. Describe the set of possible orders for this experiment.

Q3: The following data are the sales for Panda in 1000,000 of SR for the previous 25 months.

1.91	1.92	1.93	1.95	2.00	2.00	2.01	2.05	2.07	2.09
2.09	2.10	2.12	2.15	2.16	2.24	2.27	2.28	2.30	2.33
2.39	2.44	2.45	2.55	2.60					

a. (*3 pts.*) Construct a stem – and – leaf plot for the data, comment on the shape of the data distribution.

b. (*5 pts.*) Compute the mean, the median, the mode, and the standard deviation. Comment on the shape.

c. (*4 pts.*) Using the z-score, do these data contain an outlier? Explain

1.

2.

d. (*2 pts.*) Which is the better measure of center for these data, the mean or the median? Explain.

e. (*3 pts.*) Starting from 1.9 with class width 0.2, construct a grouped relative frequency distribution.

f. (*3 pts.*) Construct a frequency histogram for these data. Comment on the shape.

g. (*4 pts.*) Construct The Box plot. Comment on shape of the data set.

Q4: The probability that house sales will increase in the next 6 months is estimated to be 0.25. The probability that the interest rates on housing loans will go up in the same period is estimated to be 0.74. The probability that house sales or interest rates will go up during the next 6 months is estimated to be 0.89.

a. (*2 pts.*) Find the probability that both house sales and interest rates will increase during the next 6 months.

b. (*2 pts.*) Find the probability that house sales will increase but interest rates will not during the next 6 months.

c. (*2 pts.*) Find the probability that neither house sales nor interest rates will increase during the next 6 months.

d. (*2 pts.*) If house sales will increase during the next 6 months, what is the probability that the interest rates will not increase during the next 6 months?

e. (*2 pts.*) Are the events increase in house sales and increase in interest rates in the next 6 months independent? Explain

f. (*2 pts.*) The events increase in house sales and increase in interest rates in the next 6 months mutually exclusive?

Q5: A company has 2 machines that produce widgets. An older machine produces 23% defective widgets, while the new machine produces only 8% defective widgets. In addition, the new machine produces 3 times as many widgets as the older machine does.

a. (*3 pts.*) What is the probability that a randomly chosen widget produced by the company is defective?

b. (*2 pts.*) Given a randomly chosen widget was tested and found to be defective, what is the probability it was produced by the new machine?

Q6: (*4 pts.*) Three companies A,B and C are bidding on a project. A and B have the same probability of winning and each is twice as likely to win as C. Find the probability that B or C wins.

Formula Sheet

Descriptive Statistics

- $\bar{x} = \frac{\sum x}{n}$ or $\bar{x} = \frac{\sum xf}{\sum f}$
- $s = \sqrt{\frac{\sum x^2 - n\bar{x}^2}{n-1}}$ or $s = \sqrt{\frac{\sum x^2 f - n\bar{x}^2}{n-1}}$
- $R_\alpha = \frac{\alpha(n+1)}{100}$

  & $P_\alpha = X_{(i)} + d\left(X_{(i+1)} - X_{(i)}\right)$

Probability

- $P(A \cup B) = P(A) + P(B) - P(A \cap B)$
- $P(A|B) = \frac{P(A \cap B)}{P(B)}, P(B) > 0$
- $P\left(A_j \middle| B\right) = \frac{P(A_j \cap B)}{P(B)} = \frac{P(A_j)P\left(B \middle| A_j\right)}{\sum_{i=1}^{k} P(A_i)P(B|A_i)}, \quad j = 1, 2, \ldots, k$