

KING FAHD UNIVERSITY OF PETROLEUM & MINERALS
DEPARTMENT OF MATHEMATICS AND STATISTICS
Term 131

STAT 213 Statistics for Actuaries

First Major Exam

Tuesday October 8, 2013

Name: _____ ID #: _____

☺Important Note:

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

Question No	Full Marks	Marks Obtained
1	25	
2	6	
3	9	
4	10	
Total	50	

1) The following data are returns in Saudi Riyals (SR) on a sample of 15 stocks:

-1.2 3.9 8.3 9 9.5 10 11 11.6
12.5 13 14.8 15.5 16.2 16.7 18

a) Find the interquartile range and explain what it means in terms of the stock returns. (4 pts.)

b) Find the 85th percentile, and explain what it means in terms of the stock returns. (3 pts.)

c) What percentage of data is within one standard deviation from the mean? (4 pts.)

You may use:

Sum of the returns = SR 168.8 Sum of the squares of returns = (SR)² 2262.22

d) What does that imply about the shape of the distribution? (1 pt.)

e) Draw a histogram with 5 intervals starting at -1.5, and comment on the shape. (4 pts.)

f) Estimate the mean and the standard deviation from the histogram. (5 pts.)

g) Draw an ogive, and use it to find the 90th percentile. (4 pts.)

- 2) The following data are the time, in seconds, it took a group of 42 insurance adjusters to perform a given task:

62	60	56	53	52	50	47	45	42	41	41	37	35
34	32	31	30	29	29	28	27	27	27	26	24	23
22	22	22	21	21	21	20	17	16	15	15	15	13
12	12	11										

Construct a stem and leaf plot and comment on it.

(6pts.)

- 3) The following table gives number of claims at a large insurance company by kind and by geographic region

	East	South	West	North	
Hospitalization	70	150	30	50	
Physician Visit	230	520	105	251	
Outpatient Treatment	100	280	65	99	
	400	900	200	400	1900

- a) If a claim is chosen at random, what is the probability that it is for hospitalization?
(2 pts.)
- b) If a claim is chosen at random, what is the probability that it is from the west? (1 pt.)
- c) What is the probability that a randomly chosen claim is either from the west or from the south? What is the relation between these two events? (2 pts.)
- d) Are the events “The claim is for an outpatient visit” and “The claim is from the south region” independent? Justify your answer. (2 pts.)
- e) What is the probability that a randomly chosen claim is for a physician’s visit in the east? (1 pt.)
- f) If a claim is from the north, what is the probability that it is for outpatient treatment? (1 pt.)

- 4) A realtor is trying to sell a piece of land. He believes there is a 0.9 chance that the land will be sold in the next 6 months if the local economy improves and a 0.50 probability that the property will be sold if the economy does not improve. An economist believes there is a 70% chance the economy will improve during the next 6 months.
- a) What is the probability that the land will be sold? *(6 pts.)*

- b) If the piece of land was not sold, how probable is it that the economy did not improve? *(4 pts.)*