MASENO UNIVERSITY

UNIVERSITY EXAMINATIONS 2012/2013

FIRST YEAR SECOND SEMESTER EXAMINATIONS FOR THE DEGREE OF BACHELOR OF SCIENCE WITH INFORMATION TECHNOLOGY
(MAIN CAMPUS - RESIT)

SMI 104: DESCRIPTIVE ANALYSIS AND PRESENTATION

Date: 22nd July, 2013   Time: 1.00 a.m.- 1.00 p.m.

INSTRUCTIONS:

+ Answer Question ONE (COMPULSORY) and any other TWO questions.

SMI 104: Descriptive Analysis and Presentation   **Time:** 2 Hours

Answer **Question 1** and any other two questions

Question 1 (30 Marks)

a) Define a measure of central tendency in a given data set. State and describe
   three common measures of central tendency   (8 Marks)

b) The figure below is a histogram of 100 times between successive arrivals in a
   store. Estimate the mean of the data.   (8 Marks)
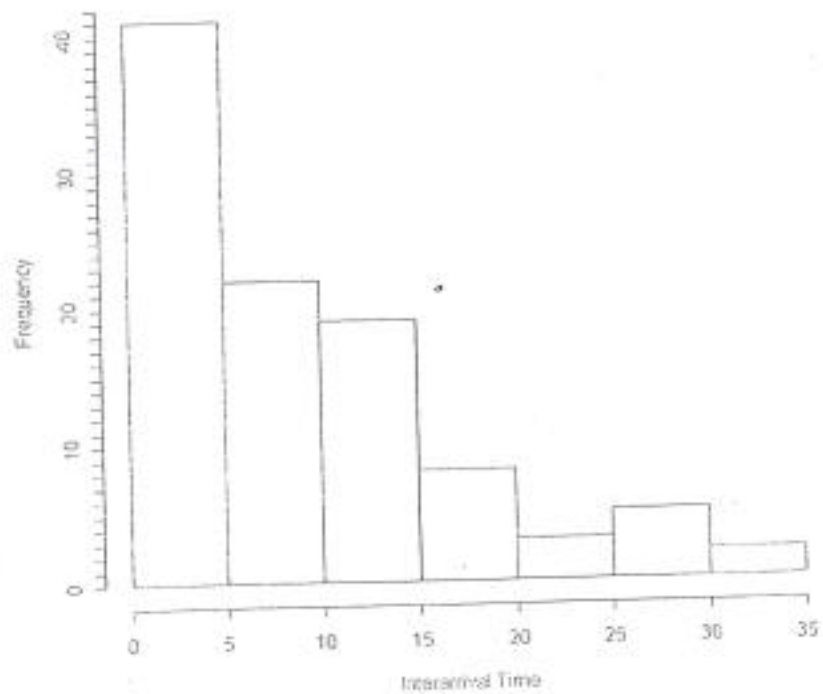
Without taking the sports drink.		Having taken the sports drink.
5	20	3 4
1 1 1	21	3 4 7
8 8 4 3 2	22	
	23	1 2 2
	24	0
	25	8
	26	1
	27	
	28	2 3 6 6 7 7
	29	2 4 4 5 5 5 8 9 9
	30	1 3 4 5 6 7 8 8 9
5	31	
6 4 4 3 0 0	32	1 1 4 9
9 9 6 5 4 4 3 3 2 1	33	3 3 3 2
7 7 5 5 6 6 6 1 0	34	5
8 8 8 3 3	35	0 0
. 7 3 2	36	1
1	37	2
	38	3 5
2 2	39	
4 4 2 0	40	

Key: 32 | 1 means 32.1 minutes

a) Based on the diagrams, approximate the median speed without taking the sports drink and the median speed having taken the sports drink. What does this information tell you? (5 Marks)

b) Compare the distributions of each of the data sets above. (6 Marks)
  i. Is there evidence from the diagrams to suggest that taking the sports drink improves performance? Justify your conclusions. (2 Marks)
  ii. Make an argument, based on the two data sets, that taking the sports drink does not improve performance. (2 Marks)

c) After completing the experiment, David wondered how accurate his study was. He realized that he had not specified how much of the sports drink the runners should take. He asked 20 of the runners approximately how many milliliters of sports drink they had taken and recorded this alongside their time. The results are as follows:

Time (mins)	Sports drink (ml)
20.3	250
21.7	100
21.8	120
24	80
28.6	300
29.4	130
29.5	300
29.9	280
32.1	300
32.1	100
33.2	80
35	220
38.3	180
20.6	100
29.2	200
29.8	250
36.1	80
29.9	120
30.9	240
30.1	280

i. Display the data in a way that allows you to examine the relationship between the two data sets. (3 Marks)

ii. Is there evidence that there is a relationship between the time taken to complete the 5 km and the amount of sports drink taken before the race? (2 Marks)

Question 5 (20 Marks)

a) To enter a particular college course, candidates must complete an aptitude test. In 2010 the mean score was 490 with a standard deviation of 100. The distribution of the scores on the aptitude test is a normal distribution.

    i.   What percentage of candidates scored between 390 and 590 on this aptitude test?   (2 Marks)

    ii.   One student scored 795 on this test. How does this student's score compare to the rest of the scores?   (2 Marks)

    iii.   The college admits only students who were among the highest 16% of the scores on this test. What score would a student need on this test to be qualified for admission to this college? Explain your answer.

                                                                 (3 Marks)

    iv.   Alice is preparing to sit the aptitude test in 2011. She heard that a score of over 650 would guarantee her a place on the course. She knew 20 people who were going to take the test. Based on the mean and standard deviation in 2010, approximately how many of the people Alice knew were likely to get a score of above 650 and secure a place on the course? Justify your answer.   (3 Marks)

b) A group of students were asked "Do you get worried *about* your exams?" They were asked to circle one of the following to answer the question: Never, Rarely, Sometimes, and Frequently. The data below shows the answers from a sample of boys and girls.

Boys		Girls	
Frequently	Never	Never	Sometimes
Never	Sometimes	Sometimes	Rarely
Sometimes	Rarely	Never	Frequently
Sometimes	Sometimes	Frequently	Never
Frequently	Never	Sometimes	Rarely
Sometimes	Never	Frequently	Rarely
Rarely	Sometimes	Sometimes	Frequently
Rarely	Never	Frequently	Frequently
Frequently	Frequently	Rarely	Frequently
Never	Rarely	Frequently	Frequently
Rarely	Sometimes	Sometimes	Sometimes

Rarely	Rarely	Sometimes	Never
Frequently	Never	Rarely	Frequently
Never	Sometimes	Frequently	Never
Frequently	Rarely	Never	Frequently

i. Display the data in a way which allows you to compare the two samples

(6 Marks)

ii. Compare the two sets based on your display

(4 Marks)