

MURANGA UNIVERSITY COLLEGE

(A constituent College of Jomo Kenyatta University of Agriculture & Technology)

MAIN CAMPUS

ORDINARY UNIVERSITY EXAMINATIONS

2014/2015 ACADEMIC YEAR

FIRST YEAR SECOND SEMESTER EXAMINATIONS

**FOR THE DEGREE
OF
MASTER OF PUBLIC ADMINISTRATION**

COURSE CODE: BCP 4108

COURSE TITLE: STATISTICS FOR RESEARCHERS

DATE: August 2015

TIME: Two Hours

INSTRUCTIONS TO CANDIDATES

Answer Question ONE (1) and any other THREE Questions

MRUC observes ZERO tolerance to examination irregularities

This Paper Consists of 2 Printed Pages. Please Turn Over. ►

QUESTION ONE

The management of a public chain of fast food restaurants wants to investigate the relationship between the daily sales volume of a company restaurant and the number of competitor restaurants within a 1-mile radius. The following data has been collected.

Competitors	Sales
1	3600
1	3300
2	3100
3	2900
3	2700
5	2300
5	2000
6	1800

Required

- Draw a scatter diagram to examine whether a relationship exists between the number of competitors and the volume of sales. Once your scatter diagram has been produced it should be clearly interpreted. **(10 Marks)**
- Refer to the fast food sales data given in Q and use correlation analysis to examine whether a relationship exists between the number of competitors and the volume of sales. Your results should be clearly interpreted. **(5 Marks)**

QUESTION TWO

Experiments were run in several different scientific laboratories to determine the vapour pressure of cadmium as a function of temperature. The data below shows the results from one of the laboratories:

Temper. (Kelvins)	Pressure (Millionths of an Atmosphere)
525	10.1000
501	2.8300
475	0.6370
452	0.1590
413	0.0086
551	31.2000
503	2.9800
488	1.3900
569	89.7000
432	0.0489

- Plot the above data on a scatter diagram and then use correlation analysis to measure the association between the two variables. **(7 Marks)**

- b. Develop one linear regression model and two polynomial regression models and calculate the value of R^2 for each model. Which of the three models has produced the closest fit? **(8 Marks)**

QUESTION THREE

- a. Explain the meaning and the causes for outliers **(4 marks)**
b. Describe how one can detect outliers **(6 marks)**
c. Why is it important sometimes to retain outliers in data collected **(5 marks)**

QUESTION FOUR

Write short notes on any 5 of the following

3 Marks each

- a. Mean
b. Mode
c. Standard Deviation
d. Range
e. Percentiles
f. Median
g. Quartile
h. Z-scores
i. Mean Deviation

QUESTION FIVE

- a) The training department of a company wishes to determine if there is any difference in the performance between the workers that have completed a training program and those that have not completed the program. A sample of 100 trained workers reveals an average output of 74.3 parts per hour with a sample standard deviation of 16 parts per hour. A sample of 100 who have not been trained has an average output of 69.7 parts per hour with a standard deviation of 18 parts per hour. Is there evidence of a difference in output between the two groups? Write a 95% confidence interval estimate of the difference. **(10 Marks)**

- b) Explain the assumptions underlying Z- test and T-testin hypotheses testing

(5 Marks)