



MACHAKOS UNIVERSITY

University Examinations for 2018/2019

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

FOURTH YEAR SECOND SEMESTER EXAMINATION FOR

BACHELOR OF SCIENCE (STATISTICS AND PROGRAMMING)

SST406: STATISTICAL PROGRAMMING

DATE: 2/5/2019

TIME: 8.30-10.30 AM

INSTRUCTIONS

Answer **question ONE** and any other **TWO** questions.

QUESTION ONE (30 MARKS)

- a) Explain what is R programming language and its two applications. (3 marks)
- b) Write a syntax of Matrices in R programming language. (2 marks)
- c) Explain how you can start the R programming commander GUI. (2 marks)
- d) Explain three ways on how you can import Data in R programming. (3 marks)
- e) Explain how R programming commands are written. (2 marks)
- f) Explain how you can save your data in R programming. (2 marks)
- g) Explain how you can produce co-relations and covariances in programming. (2 marks)
- h) Explain the significance of **t-tests** in programming. (2 marks)
- i) Explain the use of With () and By () functions in R programming. (2 marks)
- j) Describe three data structures in R that is used to perform statistical analyses and create graphs. (3 marks)
- k) Describe how to merge two dataframes in R programming language. (3 marks)
- l) Citing examples differentiate between decision making and looping statements in R programming (4 marks)

QUESTION TWO (20 MARKS)

- a) Using a code describe how to measure the central tendency of the given data using R programming. (6 marks)
- b) Describe how to plot Cause and Effect Diagram in R programming. (7 marks)
- c) Describe the functions available in R programming and explain how to define a function and call the same using examples. (7 marks)

QUESTION THREE (20 MARKS)

- a) Describe four types of operators available in R programming. (8 marks)
- b) Explain how to use apply, sapply, lapply, tapply functions in R programming. (6 marks)
- c) Explain how to resolve missing data or Missing Values in R programming. (6 marks)

QUESTION FOUR (20 MARKS)

- a) Discuss how to implement Area Chart using ggplot2 in R programming. (5 marks)
- b) Describe four functions used to implement normal distribution in R programming. (4 marks)
- c) Describe and write a code on how to implement rank, order and sort function in R programming. (6 marks)
- d) Describe how to implement Time Series Modeling and Forecasting for the R inbuilt dataset AirPassengers in R Programming. (5 marks)

QUESTION FIVE (20 MARKS)

- a) Describe the six steps on how to cluster customers into groups based on shopping behaviour using Clustering Algorithm in R programming. (6 marks)
- b) Using a code describe how to implement cbind, rbind and merge function in R programming. (9 marks)
- c) Describe how to implement Poisson distribution in R programming. (5 marks)