**MACHAKOS UNIVERSITY**

**SCHOOL OF ENGINEERING AND INFORMATION TECHNOLOGY**

**END OF JAN-APRIL SEMESTER EXAMS**

**DEPARTMENT OF CIT**

**SST-STATISTICAL PROGRAMMING**

INSTRUCTIONS

ANSWER QUESTION ONE AND ANY OTHER TWO QUESTIONS

**QUESTION ONE [30 MARKS]**

1. Explain what is R programming language and its two applications. [3 marks]
2. Write a syntax of Matrices in R programming language. [2 marks]
3. Explain how you can start the R programming commander GUI. [2 marks]
4. Explain three ways on how you can import Data in R programming. [3 marks]
5. Explain how R programming commands are written. [2 marks]
6. Explain how you can save your data in R programming. [2 marks]
7. Explain how you can produce co-relations and covariances in programming. [2 marks]
8. Explain the significance of **t-tests** in programming. [2 marks]
9. Explain the use of **With ()** and **By ()** functions in R programming. [2 marks]
10. Describe three data structures in R that is used to perform statistical analyses and create graphs. [3 marks]
11. Describe how to merge two dataframes in R programming language. [3 marks]
12. Citing examples differentiate between decision making and looping statements in R programming [4 marks]

**QESTION TWO [20 MARKS]**

1. Using a code describe how to measure the central tendency of the given data using R programming. [6 marks]
2. Describe how to plot Cause and Effect Diagram in R programming. [7 marks]
3. Describe the functions available in R programming and explain how to define a function and call the same using examples. [7 marks]

**QESTION THREE [20 MARKS]**

1. Describe **four** types of operators available in R programming. [8 marks]
2. Explain how to use **apply**, **sapply**, **lapply**, **tapply** functions in R programming. [6 marks]
3. Explain how to resolve missing data or Missing Values in R programming. [6 marks]

**QESTION FOUR [20 MARKS]**

1. Discuss how to implement Area Chart using ggplot2 in R programming. [5 marks]
2. Describe four functions used to implement normal distribution in R programming. [4 marks]
3. Describe and write a code on how to implement rank, order and sort function in R programming. [6 marks]
4. Describe how to implement Time Series Modeling and Forecasting for the R inbuilt dataset Air Passengers in R Programming. [5 marks]

**QESTION FIVE [20 MARKS]**

1. Describe the six steps on how to cluster customers into groups based on shopping behaviour using Clustering Algorithm in R programming. [6 marks]
2. Using a code describe how to implement **cbind,** **rbind** and merge funcion in R programming. [9 marks]
3. Describe how to implement Poisson distribution in R programming. [5 marks]