S.C.No.—21703411 (

M. Sc. EXAMINATION, 2023

(Fourth Semester)

(Main/Reappear/Improvement)

(2021)

MATHEMATICS

21MTH-411

Introduction to LaTeX and R Programming

Time : 3 Hours   **Maximum Marks : 80**

Note : Attempt any *Five* questions. All questions carry equal marks.

1. Explain the following :

 (a) Text formatting in LaTeX

 (b) Variables in R

 (c) Probability

 (d) Inserting Footnotes in LaTeX.

 (e) Pie Chart in R

 (f) Creating Matrix in R

 (g) Input function in R

 (h) Hyperlink in LaTeX. 8×2=16

Unit I

2. (a) What is LaTeX ? What are the merits and demerits of using LaTeX over MS-Word ? Explain. 8

 (b) Describe the document structure of LaTeX document. How you can add lists in LaTeX document ? Explain. 8

3. (a) Explain LaTeX commands used for formatting of the document. 8

 (b) How mathematical equations are typed in LaTeX ? Explain by giving suitable examples. 8

Unit II

4. (a) Explain the procedure to generate a table of contents in LaTeX. 8

(b) What are the various commands used in creating tables in LaTeX ? Explain with an example. 8

5. (a) What is Bibliography ? How to insert bibliography in LaTeX document ? Explain. 8

(b) Describe plotting and visualizing data in LaTeX. 8

Unit III

6. (a) What is a List ? Explain various list manipulation functions in R with examples. 8

(b) What are the various operators used in R ? Explain with examples. 8

7. (a) What are Data Frames ? How is it different from list ? Write a script in R to create data frame of students and implement manipulation functions on the data frame. 8

(b) Explain the following : 2×4=8

(i) Control Statements in R

(ii) Factors and Tables.

Unit IV

8. (a) What are Regular Expressions ? Explain regular expression commands with suitable examples in R. 8

(b) Describe Line chart, Bar plot and Scatter plot in R programming. 8

9. Explain the following : 4×4=16

(a) Sampling distribution

(b) t-test

(c) Correlation

(d) String functions in R.