

CMR ENGINEERING COLLEGE: : HYDERABAD

UGC AUTONOMOUS

III-B.TECH-II-Semester End Examinations (Supply) - June- 2025

R-PROGRAMMING

(CSM)

[Time: 3 Hours]

[Max. Marks: 70]

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 20 marks. Answer all questions in Part A.

Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART-A**(20 Marks)**

1. a) Differentiate between numeric and integer data types in R. [2M]
- b) Explain the rules for variable names in R? How is assignment done? [2M]
- c) Create a function in R to calculate the factorial of a number. [2M]
- d) Differentiate between Lists and Vectors in R. [2M]
- e) Write the syntax to add and delete elements in a list. [2M]
- f) Create a data frame with columns for ID, Name, and Age. [2M]
- g) Create a subtable from a table in R with example. [2M]
- h) Calculate the cumulative sum of a numeric vector in R? [2M]
- i) Define generic function in R. [2M]
- j) Explain profiling in R and why is it useful in optimization. [2M]

PART-B**(50 Marks)**

2. Describe the basic structure of the R programming environment. How do you run R and install packages? [10M]

OR

3. Discuss the use of operators in R, including arithmetic, logical, and comparison operators. [10M]
4. Explain the properties and types of vectors in R. How do you create and manipulate vectors. [10M]

OR

5. Create a R script that: [10M]
 - i. Generates a sequence of numbers from 1 to 50.
 - ii. Extracts elements that are multiples of 5.
 - iii. Applies a function to calculate the square of each extracted element.
 - iv. Uses logical subscripts to find and print elements greater than 100
6. Discuss the various operations that can be performed on lists in R. Provide examples of creating a list, accessing elements, modifying elements, and performing list operations like merging and applying function. [10M]

OR

7. Create a data frame with columns for ID, Name, Age, and Score. Filter rows where Age is greater than 30, sort the data frame by Score in descending order, and calculate summary statistics for the Score column. [10M]

8. Discuss how tables are used in R for data analysis, including creation, manipulation, and common operations. Provide examples of creating tables, performing matrix-like operations, and extracting subtables. [10M]

OR

9. You are provided with survey data collected from a group of individuals regarding their preferences for different types of fruits. The dataset contains the following information: ID: Unique identifier for each respondent, Age: Age of the respondent, Fruit: Preference for a certain type of fruit (Apple, Banana, Orange, Mango). Perform the following tasks: [10M]

- i. Create a factor for the "Fruit" column with levels in alphabetical order.
- ii. Calculate the frequency of each fruit preference.
- iii. Create a new column named "Age_Group" to categorize respondents into age groups: "Young" (age ≤ 30) and "Old" (age > 30).
- iv. Generate a summary table that shows the frequency of each fruit preference for each age group.
- v. Extract a subtable containing the preferences of "Old" respondents who prefer "Apple".

10. Describe the structure of S generic functions. Provide an example of defining and using a generic function in R. [10M]

OR

11. Describe simulation code in R. Provide an example of using simulation code to solve a practical problem. [10M]
