

(FOR THE CANDIDATES ADMITTED

22UCS619

DURING THE ACADEMIC YEAR 2022 ONLY)

REG.NO.

N.G.M.COLLEGE (AUTONOMOUS) : POLLACHI

END-OF-SEMESTER EXAMINATIONS : MAY 2025

BSc.Computer Science(Aided & Sf)

MAXIMUM MARKS: 50

SEMESTER-VI

TIME : 3 HOURS

**PART – III**

**22UCS619 – R PROGRAMMING**

**SECTION – A**

**(10 X 1 = 10 MARKS)**

**ANSWER THE FOLLOWING QUESTIONS:-(K1)**

1. What is the R Project primarily used for?
  - a) Video Editing
  - b) Data Analysis and Statistical Computing
  - c) Game Development
  - d) Web Development
2. What is the class of the following R object: `x <- c(1, 2, 3, 4)`?
  - a) Matrix      b) List      c) Vector      d) Data frame
3. What does the `str()` function in R do?
  - a) Displays the structure of an object
  - b) Strips spaces from a string
  - c) Splits a string into multiple words
  - d) Converts a string to lowercase
- 4 Which of the following functions is used to perform linear regression in R?
  - a) `lm()`      b) `reg()`      c) `model()`      d) `lm.regression()`
5. A box plot is primarily used to display:\_\_\_\_\_.
  - a) Frequency distribution of continuous data
  - b) Relationships between two variables
  - c) The spread and central tendency of continuous data
  - d) Proportions of categories

**ANSWER THE FOLLOWING IN ONE (OR) TWO SENTENCES**

**(K2)**

6. What is the difference between R code and R scripts?
7. What is an array in R, and how does it differ from a matrix?
8. How can you define a function in R that adds two numbers?
9. What function is used to write data to an Excel file in R?
10. Which R function is used to create a pie chart?

**(CONT...2)**

**SECTION – B****(5 X 3 = 15 MARKS)****ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS. (K3)**

11. a) What is the role of comments in R? Provide examples of single-line and multi-line comments.(OR)  
b) What are R packages, and why are they important in R programming?
12. a) Discuss the different variable classes in R and their characteristics. Provide examples for each class.(OR)  
b) What is a Data Frame? Explain the Characteristics of Data frame.
13. a) Explain how decision-making structures like if statements and the ifelse() function work in R.  
Illustrate with examples. (OR)  
b) Create a function to print squares of numbers in sequence.
14. a) Discuss how to read and process XML files in R. (OR)  
b) How do you perform linear regression in R? Explain the steps..
15. a) Create a pie chart for a dataset representing the sales distribution of different products. Customize appearance with additional arguments.  
sales = (150, 200, 120, 80)  
products = ("Product A", "Product B", "Product C", "Product D") (OR)  
b) Explain the differences between bar charts and histograms, and when each should be used.

**SECTION – C****(5 X 5 = 25 MARKS)****ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS. (K4 (Or) K5)**

16. a) Explain the role of Graphical User Interfaces (GUIs) in R. (OR)  
b) What are the R packages for data visualization and data manipulation? Provide an example.
17. a) What is an Array? Give two vectors as input create 3X3 matrices using array function. (OR)  
b) Write an R script to perform the following tasks:
  1. Create a data frame named employee\_data with the following columns and data:
    - o emp\_id (Employee ID): 1, 2, 3
    - o emp\_name (Employee Name): "Rick", "Dan", "Michelle"
    - o salary (Salary): 623.30, 515.20, 611.00
    - o start\_date (Start Date): "2024-01-01", "2024-09-23", "2014-11-15"
  2. Print the structure of the data frame.
  3. Display a summary of the data frame, showing statistical information for numeric columns and appropriate summaries for non-numeric columns.
18. a) Discuss common string operations like concatenation, splitting, and substitution with examples.(OR)  
b) Write a function using the switch() statement to return the name of a day of the week based on a numerical input (1 for Sunday, 2 for Monday, etc.). Provide an example of how the function works.
19. a) 1. Write an R script to perform the following tasks:
  - Read a CSV file named data.csv into a data frame in R. Ensure the file exists in the working directory.
  - Print the first 6 rows of the data frame to confirm successful loading.
 1. Create a new data frame named student\_data with the following information:
  - student\_id: 101, 102, 103
  - name: "Alice", "Bob", "Charlie"
  - marks: 87, 92, 78
 2. Write the student\_data data frame to a new CSV file named student\_data.csv in the working directory.(OR)  
b) Calculate mean,median,mode and print the result.
20. a) 1. How do you create a scatter plot in R using the plot() function? Explain its purpose.  
2. Use the mtcars dataset to perform the following tasks:
  - Create a scatter plot to show the relationship between miles per gallon (MPG) and horsepower (hp).
  - Add appropriate labels for the x-axis, y-axis, and the plot title.
  - Use a different color for the points to enhance visualization.
 3. Based on the scatter plot, briefly describe the relationship between MPG and horsepower. (OR)  
b) What are box plots in R, and how can they help in identifying outliers in a dataset? Provide an example.