

(FOR THE CANDIDATES ADMITTED

24UDA411

DURING THE ACADEMIC YEAR 2024 ONLY) REG.NO. :

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

B.Sc Computer Science With Data Analytics

MAXIMUM MARKS: 75

END-OF-SEMESTER EXAMINATIONS :MAY 2026

SEMESTER- IV

TIME : 3 HOURS

**PART-III**

**24UDA411– R PROGRAMMING**

**SECTION – A**

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

**ANSWER THE FOLLOWING QUESTIONS.**

1. Which of the following is used to create categorical variables in R?

A) matrix()

B) data.frame()C) factor()

D) list()

2. Which function is primarily used to read tabular data files in R?

A) read.csv()

B) read.table()

C) load()

D) scan()

3. Which operator is used in the **dplyr** package for chaining multiple operations?

A) ->

B) ::

C) %>%

D) &

4. Which scoping rule does R follow?

A) Dynamic scoping

B) Global scoping

C) Lexical scoping

D) Static binding

5. Which function is used to apply a function over a list and return a list?

A) apply()

B) sapply()

C) lapply()

D) tapply()

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

6. What is a vector ?

7. Define binary data format in R.

8. Define vectorized operation in R.

9. What is lazy evaluation?

10. How will you debug in R?

**(CONTD .... 2)**

**SECTION – B**

**(5 X 5 = 25 MARKS)**

**ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS.**

11. a) Explain the basic features of R. How does its design philosophy differ from the S language?  
**(OR)**  
b) Create a data frame in R containing student names, marks, and grades. Demonstrate how vectors, factors, and attributes are used in constructing it.
12. a) Explain how `read.table()` is used to read data files in R. Mention important arguments used in the function.  
**(OR)**  
b) Demonstrate how to read data from a URL connection and store it in a data frame in R.
13. a) Illustrate different methods of subsetting a vector and a matrix in R with examples.  
**(OR)**  
b) Explain vectorized operations in R. Why are they preferred over loops?
14. a) Explain the working of control structures in R with examples of `if-else` and `for` loops.  
**(OR)**  
b) Write a user-defined function in R to calculate the factorial of a number. Explain argument matching in your function.
15. a) Differentiate between `lapply()` and `sapply()` with suitable examples. **(OR)**  
b) Explain the purpose of debugging tools in R. Briefly describe the use of `traceback()` and `debug()`.

**SECTION – C**

**(5 X 8 = 40 MARKS)**

**ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS.**

16. a) Discuss different R objects such as vectors, matrices, lists, and factors. Compare their structures and explain suitable scenarios for using each. **(OR)**  
b) Explain the limitations of R. Suggest possible solutions or alternatives to overcome these limitations in handling large datasets.
17. a) Compare textual and binary formats for storing data in R. Explain the use of `dput()`, `dump()`, and binary files with examples. **(OR)**  
b) Explain how memory requirements for R objects are calculated. Illustrate with an example involving a large dataset and discuss how the `readr` package improves performance.
18. a) Explain how the `dplyr` package manages data frames using functions like `select()`, `filter()`, `mutate()`, and `group_by()`. Provide a structured example. **(OR)**  
b) Describe how dates and times are handled in R. Demonstrate operations such as date arithmetic and time formatting with examples.
19. a) Discuss lexical scoping in R. Compare lexical and dynamic scoping with suitable examples. **(OR)**  
b) Explain lazy evaluation and the use of the `...` argument in R functions. Discuss how these features improve flexibility in programming.
20. a) Explain various loop functions in R such as `apply()`, `tapply()`, and `mapply()`. Compare their usage with suitable examples. **(OR)**  
b) Describe the process of simulation in R. Explain how random numbers are generated, how seeds are set, and how a simple linear model can be simulated.

