Total No. of Questions: 22

Enrollment No : _____

MEDICAPS UNIVERSITY

Faculty of Engineering / Science

End Semester Examination May 2025

OE00051 R Programming

Programme	:	B.Tech. / B. Sc.	**Branch/Specialisation**	:	All
Duration	:	3 hours	**Maximum Marks**	:	60

Note: *All questions are compulsory. Internal choices, if any, are indicated. Assume suitable data if necessary. Notations and symbols have their usual meaning.*

Section 1 (Answer all question(s))

		Marks	CO	BL
Q1.	Which of the following is used to create a vector in R?	1	1	1

- ○ list()
- ○ matrix()
- ◉ c()
- ○ array()

		Marks	CO	BL
Q2.	What operation is performed by operator %%?	1	1	1

- ◉ Modulus
- ○ Integer division
- ○ Floating point division
- ○ None of the above

		Marks	CO	BL
Q3.	Which R command will produce the following matrix?	1	2	1

```
     [,1] [,2] [,3]
[1,]    1    2    3
[2,]    4    5    6
[3,]    7    8    9
```

- ○ > matrix(1:9, nrow=3)
- ○ > matrix(1:9,byrow=T)
- ○ > matrix(1:9,ncol=3,byrow=F)
- ◉ matrix(1:9, nrow=3, byrow=T)

		Marks	CO	BL
Q4.	Which of the following function is not supported by list?	1	2	1

- ○ sapply()
- ○ lapply()
- ◉ apply()
- ○ None of the above

		Marks	CO	BL
Q5.	Which of the following is not a R debug function?	1	3	1

- ○ traceback()
- ○ debug()
- ◉ cback()
- ○ browser()

		Marks	CO	BL
Q6.	What is false about R function definition?	1	3	1

- ○ Return statement is optional
- ○ Always return the value of last line of function body.
- ◉ Return statement is compulsory
- ○ None of the above

		Marks	CO	BL
Q7.	Which of following is necessary argument in 'read.table()' function?	1	4	1

- ○ header
- ◉ file
- ○ sep
- ○ quote

		Marks	CO	BL
Q8.	Which argument in 'read.csv()' function create character column of csv file as factor?	1	4	1

- ○ colClasses
- ○ col.names
- ○ header
- ◉ stringAsFactors

		Marks	CO	BL
Q9.	Pick the invalid R String.	1	5	2

- ○ "This is Principal's chamber"
- ◉ 'This is Principal's chamber'
- ○ 'This is Principal"s chamber'
- ○ All of above

Q10. R function that return weekday on 31-March-2025. **1 5 2**

- (●) weekdays(as.Date("2025-03-31"))
- ( ) weekday(as.Date("2025-03-31"))
- ( ) weekday("2025-03-31")
- ( ) weekdays("2025-03-31")

Section 2 (Answer all question(s))

Marks CO BL

Q11. Enlist basic features, advantages and limitations of R. **4 1 1**

Rubric	Marks
Features of R 2 marks, Advantages of R 1 marks, Limitations of R 1 marks	4

Q12. (a) Create a factor representing different types of Student Sections in a classroom: "6A", "6B", "6AI", "6AI", "6H". Perform the following operations: **6 1 2**

- Display the factor.
- Get the levels of the factor.
- Count that how many times each section is studied in the classroom.

Rubric	Marks
Code for displaying the factor 2 marks, Code for displaying the levels of the factor 2 marks, Code for Counting that how many times each section is studied in the classroom 2 marks	6

(OR)

(b) What are rules for variable naming in R. Explain each rule with example.

Rubric	Marks
Rules for variable naming 3 marks. Examples 3 marks	6

Section 3 (Answer all question(s))

Marks CO BL

Q13. Explain the difference between an array and a matrix in R. Give example for each. **4 2 2**

Rubric	Marks
Array with example 2 marks, Matrix with example 2 marks	4

Q14. (a) Explain dataframe. As an example write code for dataframe that consist "Name", "Age" and "Height" of three persons and perform following operation on above dataframe — **6 2 3**

- Access and display "Name".
- Display "Name" and "Age"of second person
- Add one more person in above dataframe

Rubric	Marks
Explain dataframe 1 mark, code for dataframe that consist "Name," "Age," and "Height" three persons 2 marks, operation on the above dataframe. 1 mark for each operation as mentioned in question 3 marks	6

(OR)

(b) Create a 3x3 matrix with numbers from 1 to 9 and perform following operatios:

- Display the matrix.
- Calculate the transpose of the matrix.
- Multiply the matrix with its transpose

Rubric	Marks
Creation of matrix 1 mark, Display the matrix 1 mark. Calculate the transpose of the matrix (2 marks). Multiply the matrix by its transpose. 2 marks	6

Section 4 (Answer all question(s))

Marks CO BL

Q15. Explain 'for' and 'while' loops in R programming . Give example of each. — **4 3 3**

Rubric	Marks
for loop with example 2 marks, while loop with example 2 marks	4

Q16. (a) What is the purpose of recursion in R programming? Provide an example of a recursive function. Write a function in R that calculates the factorial of a given number. — **6 3 3**

Rubric	Marks
purpose of recursion in R programming 1 mark, example of recursion function 2 marks, R function to compute factorial (with or without recursion) 3 marks	6

(OR)

(b) Explain S3 class, S4 class and reference class with example.

Rubric	Marks
S3 class: 2 marks; S4 class 2 marks; reference class 2 marks	6

Section 5 (Answer any 2 question(s))

Marks CO BL

Q17. How data objects are saved into the file and load from the file? Explain with function syntax. — **5 4 2**

Rubric	Marks
Data object saved into file: 2.5 marks. Data object load from the file 2.5 marks	5

Q18. What is the use of read.csv() function? Explain following parameters of read.csv() function- **5 4 2**

- file
- sep
- header

Rubric	Marks
Explaining read.csv() function 2 marks: Explaining parameters of the read.csv() function. 1 mark each. (3 marks)	5

Q19. How to read Excel files into R using the 'readxl' package? Explain with example. **5 4 2**

Rubric	Marks
How to read Excel files into R using the ***readxl*** package with example.	5

Section 6 (Answer any 2 question(s))

Marks CO BL

Q20. Consider a string " Hello,World ". Write R code to perform following operation on this string . Also write output of each operation. **5 5 2**

- Find number of characters.
- Display string in uppercase.
- Display substring "Hello".
- Split string into "Hello" and "World"
- Replace "World" by "Universe"

Rubric	Marks
1 Mark for each operation with output as mentioned in question .	5

Q21. Explain following graphics functions with their syntax and output. **5 5 2**

- plot()
- hist()
- boxplot()

Rubric	Marks
plot() mark, hist() 2 marks, boxplot() 2 marks	5

Q22. What is regular expression? How it is carried out in R? **5 5 2**

Rubric	Marks
What is regular expression? 2 marks, How it is carried out in R 3 marks	5

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