Enrollment No.....................................

Faculty of Engineering
End Sem (Even) Examination May-2022
OE00051 R Programming
Programme: B.Tech.   Branch/Specialization: All

Duration: 3 Hrs.   **Maximum Marks: 60**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d.

Q.1   i.   Which of the following is ordered arrangement of same datatype   **1**
           in one dimensional sequence?
           (a) Matrix   (b) Data Frame   (c) Vector   (d) List

      ii. Which is of following is invalid command for assigning 10 to   **1**
           variable x.
           (a) x <- 10   (b) 10 -> x
           (c) assign(10,'x')   (d) x = 10

      iii. Which of the following is one-dimensional arrangement of data?   **1**
           (a) List   (b) Vector   (c) Factor   (d) All of these

      iv. Matrix (1:9) will generate-   **1**
           (a) 1 x 9 matrix   (b) 9 x 1 matrix
           (c) Error message   (d) 3 x 3 matrix

      v.   Functions used to create S3 and S4 classes respectively-   **1**
           (a) setRefClass(), setClass() (b) setClass(), class()
           (c) setClass(), setRefClass() (d) class(), setClass()

      vi. add <- function(a,b,...) print(a+b)   **1**
           can be invoked by ……. Statement.
           (a) add(12,24)   (b) add(12,24,36)
           (c) add(12,24,36,48   (d) All of these

      vii. read.table() function creates-   **1**
           (a) List   (b) Matrix   (c) Data frame   (d) None of these

      viii. To read csv file using read.table(), what should be value of   **1**
           argument sep-
           (a) "\n"   (b) "\t"   (c) " "   (d) ","

P.T.O.

ix. The function that returns number of character in R string is- **1**
(a) length()   (b) nchar()   (c) tell()   (d) count()

x. Name of the function that search the given specific pattern in a **1**
string is-
(a) grep()   (b) grepl()
(c) Both (a) and (b)   (d) None of these

Q.2 i. Write features of R Programming language. **2**

ii. Write commands for following task **3**
(a) Create 5 elements factor F of alphabet 'a' to 'e'.
(b) Print the levels of above factor.
(c) Replace level 'd' by new level 'z'.

iii. Describe with example any five data types of R. **5**

OR iv. V1 and v2 are two vectors as created by following commands **5**
v1 = c(10,20,30)
v2 = c(50,60,70)
write R commands that performs following operations
(a) Access first element of v1 and third element of v2 by indexing.
(b) Give name to each element of v1 and v2.
(c) Print second elements of both vectors using name.
(d) Multiply each element of v1 by 5 and update v1.
(e) Add both vectors and assign it to new vector v3.

Q.3 Attempt any two.

i. Differentiate matrix and dataframe. Difference must include **5**
followings
Definition, syntax for creation and example.

ii. Write short notes on list and array. Support your explanation with **5**
inclusion of definition, syntax and example.

iii. Create a 3 x 3 matrix m and then perform following **5**
(a) Add one column in m by use of cbind function.
(b) Add one row in m by use of rbind function.
(c) Display only fourth row.
(d) Display only fourth column.

Q.4 Attempt any two.

i. Explain with examples following R loops. **5**
for loop
while loop
repeat loop

ii. What is S4 system of R. Your answer must include explanation of **5**
built-in functions that creates S4 class & objects and example
program.

iii. What is debugging? Explain traceback(), browser() and debug() **5**
debugging tools of R.

Q.5 i. Explain exporting and importing of data in R. **4**

ii. Assume book information (Title, author, price, SBIN no) are stored **6**
in csv file "Book.csv" in your computer. Write R script in that
sequence to perform.
(a) Import data of "Book.csv" into your R environment.
(b) Display entire content of "Book.csv"
(c) Print number of books information stored in "Book.csv"
(d) Add three books information and append "Book.csv"
(e) Print last 5 books information as stored in the "Book.csv"

OR iii. Describe following functions used in importing and exporting of data **6**
(a) read_xlsx()   (b) read.csv()
(c) write.csv()   (d) write.table()
(e) save()   (f) load()

Q.6 Attempt any two

i. Write a R script which draw a line plot between X and sin(X). **5**
Where x is sequence from -10*pi to 10*pi. Take X on x – axis and
sin(X) along y- axis.

ii. What is regular expression. Describe grep() and grepl() function **5**
with example.

iii. Write rules applied in construction of a string in R. Also write **5**
example string along with each rule.

******

Marking Scheme - OE00051 R Programming

Q.1   i.   Which of the following is ordered arrangement of same datatype in one dimensional sequence?   **1**
(c) Vector

ii.   Which is of following is invalid command for assigning 10 to variable x.   **1**
(c) assign(10,'x')

iii.   Which of the following is one-dimensional arrangement of data?   **1**
(d) All of these

iv.   Matrix (1:9) will generate-   **1**
(b) 9 x 1 matrix

v.   Functions used to create S3 and S4 classes respectively-   **1**
(d) class(), setClass()

vi.   add <- function(a,b,...) print(a+b)   **1**
can be invoked by ……. Statement.
(d) All of these

vii.   read.table() function creates-   **1**
(c) Data frame

viii.   To read csv file using read.table(), what should be value of argument sep-   **1**
(d) ","

ix.   The function that returns number of character in R string is-   **1**
(b) nchar()

x.   Name of the function that search the given specific pattern in a string is-   **1**
(c) Both (a) and (b)

Q.2   i.   Features of R Programming language   **2**
At least 4 features   (0.5*4) marks

ii.   (a) Create 5 elements factor F   1 mark   **3**
(b) Print the levels of above factor   1 mark
(c) Replace level 'd' by new level 'z'   1 mark

iii.   Any five data types of R   (1*5) marks   **5**

OR   iv.   **5**
(a) Access first element of v1   1 mark
(b) Give name to each element   1 mark

(c) Print second elements of   1 mark
(d) Multiply each element of   1 mark
(e) Add both vectors and assign   1 mark

Q.3   Attempt any two.
i.   Differentiate matrix and dataframe.   **5**
Definition   2 marks
Syntax   2 marks
Example   1 marks

ii.   Write short notes on list and array   **5**
Definition   2 marks
Syntax   2 marks
Example   1 marks

iii.   (a) Add one column in m by use of cbind   2 marks   **5**
(b) Add one row in m by use of rbind   2 marks
(c) Display only fourth row   1 mark
(d) Display only fourth column.
As per explanation

Q.4   Attempt any two.
i.   For loop   2 marks   **5**
While loop   1 mark
Repeat loop   2 marks

ii.   S4 system of R and its explanation   2 marks   **5**
Certation objects   1 mark
Example program   2 marks

iii.   Debugging   5 marks   **5**
As per explanation

Q.5   i.   Exporting   2 marks   **4**
Importing   2 marks

ii.   (a) Import data of "Book.csv"   1 mark   **6**
(b) Display entire content of "Book.csv"   1 mark
(c) Print number of books information   1 mark
(d) Add three books information and   2 marks
(e) Print last 5 books information as stored   1 mark

OR   iii.   Describe following functions used in importing and exporting of data **6**
            For each function   (1*6) marks

Q.6   Attempt any two

    i.   Generation of sequence   2 marks   **5**
        Generation of sin value   1 mark
        Plot function   2 marks
    ii.   Regular expression   2 makrs   **5**
        grep() and grepl() function with example   3 marks
    iii. Write rules applied in construction of a string in R. Also write **5**
        example string along with each rule.
        At least 3 rules along with example string   5 marks

******