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312403

May, 2023

BCA(DS)-IV SEMESTER

Scientific R Programming (BCA-DS-213)

Time : 3 Hours] [Max. Marks : 7

Instructions:

1. *It is compulsory to answer all the questions (1.5 mar each) of Part-A in short.*
2. *Answer any four questions from Part-B in detail.*
3. *Different sub-parts of a question are to be attempt adjacent to each other.*

PART-A

(a) Explain any *three* math functions in R.

(b) Write the syntax of ggplot2.

(c) Explain various data types in R.

(d) List the differences between vector and list.

(e) Explain Normal Distribution.

(f) What is a t-test?

(g) Write a short program to implement repeat for in R.

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(5)

(15)

(f) What is an abstract class?

(b) Explain the functioning of lapply and sapply. (3)

(c) Explain general format of matrices in R. (3)

(d) Write a for loop that iterates over the numbers 1 to 7 and prints the cube of each number using print. (3)

PART-B

2. (a) Explain Lists in R programming. Write an R program to create a list with at least four list elements of variable type vector, string, matrix and function. Also use names() function to name the list elements. (6)

(b) What do you mean by terms "vectors" and "factors" in R programming? Also write R programs to explain these terms. (6)

(c) Explain any six commands used in R programming. (3)

3. (a) How many types of loops does R programming support. Also, explain them with the help of program. (7)

(b) Differentiate between "if" and "Vectorized if" conditional executions. Write a program to implement switch function. (8)

4. (a) Explain the term Hyp
Statistical Hypothe
involved in hypothe

(b) Define and explai
qnorm, pnorm, an

(c) What is correlati

5. (a) Differentiate b
graphics. Wha

(b) Consider the
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4. (a) Explain the term Hypothesis. Describe different types of Statistical Hypothesis Testing. Also, explain steps involved in hypothesis testing. (8)

(b) Define and explain the following functions: dnorm, qnorm, pnorm and rnorm. (5)

(c) What is correlation test? (2)

5. (a) Differentiate between base graphics and ggplot2 graphics. What does col and pch attributes represent? (5)

(b) Consider the below dataset and write an R program to create a DataFrame for dataset. Also, export the DataFrame to CSV file. (10)

name	age
Jon	23
Bill	41
Maria	32
Tom	55
Emma	40

6. (a) Write a short note on Object Oriented Programming with R, S3 and reference classes. (7)

(b) Write an R program. Create two 3X3 matrices & perform their element wise multiplication & mat multiplication. (

(a) Explain the debugging techniques in R programming. (7.5)

(b) Explain different measures of central tendency with the help of examples. (7.5)
