SET B

Unique Paper Code	: 42343308
Name of the Course	: B.Sc.(Prog.) Physical Science/Mathematical Science
Name of the Paper	: Introduction to R Programming
Semester	: III
Duration	: 2 hours
Maximum Marks	: 25
Year of admission	: 2019

All questions carry equal marks. Attempt any 3 questions.

Attempt all parts of a question together.

Q1. Following data about students is stored in a CSV file (*students.csv*). Write R commands to read the file (with headers) and answer the questions given below.

students.csv

Roll No	Gender	Weight(kgs)	Height(cms)	Age(years)
1	M	68	177	18
2	M	63	168	19
3	F	59	159	17
4	M	NA	163	NA
5	F	54	156	19

Create a box plot for the height and weight of the students. Display the roll no. of the students whose height is more than 170 cms. Remove the NA values from the column 'Weight'. Display the mean and median for the weight of all students. Count the number of male(M) and female(F) students in the class.

Q2. Using the *students.csv* file (given in Q1), perform the following operations using R commands.

Add a new column 'Address' to the given dataset. Display the tallest and the shortest students in the class. Determine the students whose height is less than the average height in the class. Find correlation between age and height of the students. Rank the students according to the order of their height. Write an SQL query to display the roll numbers of male students in the class.

Q3. Write a function in R that accepts a vector of integers and returns a logical vector, as per the following conditions.

- **TRUE** when the input is even,
- **FALSE** when the input is odd,
- and **NA** when the input is nonfinite.

Write an R script to create a vector, V1, containing 5 random numbers in the range 1 to 10 without repetition and give names to each element of the vector. Also display the even indexed elements of V1. Convert the vector V1 to a list L1.

Q4. Write R commands to perform the following operations - Create a 3x3 matrix M1 to store the first 9 natural numbers. Create another 2x3 matrix, M2, with random numbers. Combine these two matrices row-wise. Write a function to calculate the sum of all values in the matrix M1. Display the location of the maximum value in M2. Determine the contingency table for the matrix M1.