Your Roll No...............

Sr. No. of Question Paper :	1029	A
Unique Paper Code	: 32343408	
Name of the Paper	: Introduction to R Programming (SEC)	
Name of the Course	: B.Sc. (H) Computer Science	
Semester	: IV	
Duration : 2 Hours		Maximum Marks : 25

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.

2. All parts of Question 1 (Part A) are compulsory.

3. Attempt any **three** questions from **Part B**.

4. All questions in **Part B** carry equal marks.

PART A

1. Answer the following questions :

(a) What value will be stored in variable "X"?

    X <- vector("complex", 3)   (1)

P.T.O.

(b) Write R statement to extract the rows from a data frame "df" that does not have missing values. (1)

(c) Write the output for statements 1 and 2 in the following R script.

```
y <- c(2, 1, 5, 7, 8, 3, 2, 4, 5)

length(y) <- 4

print(y)              #statement 1

length(y) <- 6

print(y)              #statement 2        (2)
```

(d) For the given factor f <- factor(c("abc", "abc", "cab", "bac", "abc", "cab", "cab")), what will table(f) return? (2)

(e) What are the two compulsory files in a package directory structure? (2)

(f) What is the difference between the functions "read.csv" and "read.csv2"? (2)

PART B

2. Consider 'Student' table in a MySQL database 'dbl':

   Student(roll_no, name, city, course)

   Write R script to perform the following tasks :

   (i) Load relevant packages to connect with the database.

   (ii) Establish the connection with the 'dbl' database.

   (iii) Display all tables of the database 'dbl'.

   (iv) Display the total number of students from the "Student" table.

   (v) Close the database connection. (5)

3. (a) Write output for the following command : (2)

   ```
   switch (5%/%2, sum(2:8), summary(c("a", "b")),
   sample(10, 5))
   ```

   (b) Given a list L as :

   ```
   L <- list(
           a = 2,
           b = 3,
           twin = c(2, 2),
           trip = c(2, 2, 2)
   )
   ```

P.T.O.

What will be the output of following R statements?

   (i) unlist(L)

   (ii) lapply(L, length)

   (iii) sapply(L, length)   (3)

4. Consider the following data frame "df".   (1+2+2)

SNo	Value	Class
1	98	A
2	21	B
3	67	C
4	23	A
5	11	A
6	12	C
7	34	C
8	56	B
9	78	A
10	90	C
11	12	C

Write R script to perform the following :

  (i) Display the rows of "df" where Class is "A".

  (ii) Display the total values for each class.

  (iii) Create a suitable plot to show the statistical summary of all values with respect to their class.

5. (a) Given a data frame "rect" containing the length and breadth of five rectangles and a function "rect_area" to compute the area of rectangles as :

```
rect <- data.frame(L=c(10, 5.5, 6, 7.8, 9.7),
B=c(6, 4, 1.2, 3, 4))

rect_area <- function(a, b)

{

    a*b

}
```

Write an R statement to create a package called "my area" to compute the area of rectangles using given data frame and function.   (2)

(b) For the given vectors "x" and "y".

```
x <- matrix(rep(1:3, each =2), nrow=3, ncol=2)

y <- matrix(rep(1:3, length.out=6), nrow=2, ncol=3)
```

What will be the output of :

   (i) x %*% y

   (ii) x * t(y)   (3)

6. Consider the following dataset that shows the number of times the tasks 5 are performed by either P1, P2 or jointly by P1 and P2 :

Task\Person	P1	P2	Jointly
Laundry	56	34	4
Meal	24	10	4
Cleaning	53	23	20
Dishes	32	56	40
Finances	13	23	70
Driving	10	78	0
Holidays	0	4	0

Write R script to :

   (i) Find the tasks which are performed more by the P1 than the P2.

   (ii) Display the tasks that are jointly performed by P1 and P2.

   (iii) Give a suitable plot to show the frequency of each task performed by P1 and P2. Give appropriate labels and legends.   (5)

7   (a) Write R script to read a file "my_file.txt":

   (i) headers as in input file,

   (ii) separator as new line character,

   (iii) indicate blank rows as missing values,

   (iv) quoting strings as ' '.   (2)

(b) What will be the output of 'f(5)'? Function 'f' is defined as follows :

```
f <- function(x)
{
    f <- function(x)
    {
```

```
        print(x^2)
    }
f(x) + 1
}
```

(3)