2021

STATISTICS— GENERAL

Paper : SEC-A-1

(Statistical Data Analysis using R)

Full Marks : 80

The questions are of equal value.

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Answer question nos. 1 and 2 and **any two** from the rest.

1. Answer **any fifteen** questions: 2×15

   (a) What is meant by 'R is a GNU software'?

   (b) Give two advantages of R Software.

   (c) Give two ways in which looping can be achieved in R.

   (d) Write a code to read data from a .csv file.

   (e) How would you install any additional new R package from the internet?

   (f) Write a one-line code to draw a box plot in R.

   (g) Give one difference between NA and NaN.

   (h) How to change the line width in plot() function?

   (i) How would you deal with a program having an infinite loop due to some error in the code?

   (j) How would you carry out some arithmetic operations in a table by making sure the program recognizes the header?

   (k) "R functions are also R objects"–Justify.

   (l) Write a program to illustrate the use of rbind().

  (m) Define a vector and find out its median.

   (n) Write the output for z<– c(1:20); y<– c(1:10); x=y+z; x.

   (o) The inbuilt coding of R is primarily done in which programming languages?

   (p) How can one access files on remote machines via URLs?

   (q) Is there any difference between a data frame and a table in R?

Please Turn Over

   (r) Write the output of x<–1:10; y< –ifelse(x%%2==0, 5, 12); y.

   (s) Write the output of a<–matrix(c(1,2,3,4,5,6,7,8,9),nrow=3, ncol=3); a[–1,].

   (t) Give one usage of split().

2. Answer *any six* questions: 5×6

   (a) Name different kinds of R objects. Write a code to define a 3×3 matrix in R and filter out the 1st and third row from it. Also from a new matrix with these two rows.   3+2

   (b) How would you find out the mode of an R object? How would you change the character of an R object from numeric to character?   5

   (c) How can looping be achieved with the help of a vector or matrix in R? Differentiate between rbind() and cbind().   3+2

   (d) Write a code to use data from R packages in your own program and find out the summary statistics.   5

   (e) Write a program to draw scatter plot and also carry out linear regression analysis.   5

   (f) What features make R attractive for data analysts? Write the output for z<–c(1:10); x<–z[3*1:3].   3+2

   (g) Describe in details how to draw a histogram in R. Also draw a frequency polygon on the same plot with the color red.   3+2

   (h) Illustrate with examples, 2 different methods of input and 2 methods of output in R. How can one access different elements from a data frame?   4+1

3. What do you mean by indexing in R? Demonstrate how it can be achieved using the functions subset(), which(), all() and any(). Write codes for all 4 cases. Write the output for a<–c(3:10); mean (a[3:5]).   (3+4+3)

4. (a) Define a 3×3 matrix and find out its transpose without using the function t().

   (b) How can one deal with NA in R?   5+5

5. (a) Write a vector and illustrate through an example how to develop a filtering index based on some specific condition.

   (b) What does one mean by libraries in R? How are they useful? Give an example.

   (c) Illustrate the importance of using the command line rm(list=ls(all=TRUE)). What are the inbuilt help options in R?   4+3+3

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