

B.Sc. 3rd Semester (Honours) Examination, 2020(CBCS)
Subject: Statistics
Skill Enhancement Course
Paper: SEC-1

Time :2 Hours

Full Marks : 40

The figures in the margin indicate full marks.
Candidates are required to give their answers in their own words
as far as practicable.
Notations have their usual meaning.

Statistical Data Analysis Using R

Answer *any eight* of the following questions. 8×5=40

1. Explain `dnorm()` and `par()` functions in R. Mention any four arithmetic functions in R.
2. Create a vector X of elements 4,-7,6,8,1,-6,9. Then create a vector Y containing elements of X which are non-negative.
3. Write the R code to pick up 40 numbers between 10 to 90, with replacement and compute their median and standard deviation.
4. Write the syntax to draw a pie chart in R for the following data.

Class : I II III IV V
Students: 140 100 90 120 150

5. How will you fit a straight line $Y=a+bX$ to the following data?

X: 12 17 19 21 25 30 39
Y: 52 59 46 47 28 60 39

Also estimate Y when X=35. Write the R commands without calculations.

6. In a sample of 1000 cases, the mean of certain test is 14 and the standard deviation is 2.5. Assuming the distribution to be normal, using R, find the number of students scoring between 12 and 15 and also how many students score above 18.
7. Write the R code to print the matrix $5\mathbf{I}_{10}$ where \mathbf{I}_{10} is the identity matrix of order 10. Then extract its principal diagonal in form of a vector using R commands.
8. Write the R functions for loading a matrix or data frame from a file.
9. Write the R program to perform the following steps :
 - generate 1000 samples from normal distribution with mean 0 and variance 1 and store in a vector A.
 - generate 1000 samples from normal distribution with mean 1 and variance 1 and store in a vector B.
 - add the elements of A with the corresponding elements of B and store in a vector C.
 - draw the histogram, compute the mean, median and range of the data contained in C.
10. How will you plot functions $y=x$ and $y=|x|$ in the interval $[-5,5]$ such that they are clearly distinguishable. Use red colour for the first function and blue colour for the second.

OR

Data Base Management Systems(DBMS)

Answer *any eight* of the following questions. 8×5=40

1. Discuss the advantages and disadvantages of relational database management systems.
2. What do you mean by single level and multilevel indexing?
3. Write a short note on Hierarchical databases.
4. Give syntax for DML and DDL commands. Show their operations with an example.
5. List and discuss the data types supported by SQL. Also explain how to delete a table.
6. Discuss the advantages of DBMS over file processing systems.
7. What is a database administrator? Discuss the functions of DBA.
8. Discuss about the importance of foreign key constraints in context to employee databases.
9. Explain the terms - data anomalies and data dictionary.
10. Who are the different database users? Explain their interfaces to DBMS.