Introduction to R:Installation, command line environment, overview of capabilities, brief mention of open source philosophy.

R as a calculator: The four basic arithmetic operations. Use of parentheses nesting up to arbitrary level.Thepoweroperation.Evaluationofsimpleexpressions.Quotientandremainderoperationsfor integers.Standardfunctions,e.g.,sin,cos,exp,log.   (10)

ThedifferenttypesofnumbersinR:DivisionbyzeroleadingtoInfor-Inf.NaN.NA.(Noneedtogo intodetails).Variables.Creatingavectorusingc(),seq()andcolonoperator.Howfunctionsmapover vectors. Functions to summarise a vector: sum, mean, sd, median etc. Extracting a subset from the vector (by index, by property).

R as a graphing calculator: Introduction to plotting. Plot(), lines(), abline(). No details about the graphics parametersexceptcolourandlinewidth. Barplot,Pie-chart and Histogram.Boxplot.(15)

MatrixoperationsinR:Creation.Basicoperations.Extractingsubmatrices.

Loading data from a file: read.table() and read.csv(). Mention of head=TRUE and head=FALSE. Data frames. Mention that these are like matrices, except that different columns may be of different types.   (8)

Numerical Integration in R: Trapezoidal andSimpson's1/3rd rules.

Numerical solution of equations in R: Method of fixed-point iteration and Newton-Raphson method in one unknown.

Simulation in R: Simulating a coin toss, a die roll and a card shuffle. Finding probabilities of events related to such experiments using simulation.   (12)

ReferenceBooks:

- Gardener,M.:BeginningR-TheStatisticalProgrammingLanguage,WileyPublications.
- BraunWJ,MurdochDJ:AFirstCourseinStatisticalProgrammingwithR.Cambridge University Press. New York.
- A simple introduction to R by Arnab Chakraborty (freelyavailableat[http://www.isical.ac.in/~ arnabc/](http://www.isical.ac.in/~arnabc/))
- Rforbeginnersby Emmanuel Paradis (freelyavailableathttps://cran.r-project.org/doc/contrib/Paradisrdebuts_en.pdf)