

Third Semester B.E./B.Tech. Degree Examination, Dec.2025/Jan.2026

Data Analytics with R

Time: 3 hrs.

Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.

Module – 1			M	L	C
Q.1	a.	List and explain features of R programming language.	7	L2	CO1
	b.	Define Environment. Explain how variables are assigned and accessed in an environment with suitable example.	6	L2	CO1
	c.	Write an R program to Generate Fibonacci Sequence.	7	L3	CO1
OR					
Q.2	a.	List and explain flow control statements in R programming with suitable example.	8	L2	CO1
	b.	Define vector in R language. Discuss various arithmetic operations that can be performed on vectors with example.	6	L2	CO1
	c.	Write an R program to solve a quadratic equation $ax^2 + bx + c = 0$.	6	L3	CO1
Module – 2					
Q.3	a.	Write an R program to : i) Create a 3×3 matrix named my-matrix with values 1 to 9. Print the resulting matrix. ii) Perform matrix multiplication between my-matrix and its transpose. iii) Calculate the determinant of my-matrix iv) Extract the second column of my-matrix and store it in a new vector. v) Replace the value in the third row of my-matrix with zeros. vi) Calculate the mean of each row in my-matrix vii) Compute the mean of each column in my-matrix viii) Compute transpose of my-matrix and its inverse	8	L3	CO2
	b.	Explain the following R functions with examples : i) append() ii) lapply() iii) rapply() iv) rnorm() v) dim() vi) diag()	6	L2	CO2
	c.	Develop/ write an R program using functions to find and print all the prime numbers up to a specified number by using method of Sieve of Eratosthenes.	6	L3	CO2
OR					
Q.4	a.	What is a Dataframe in R Language? Illustrate how to merge or join two dataframes with example.	6	L3	CO2
	b.	Explain the following R functions with example : i) head() ii) filter() iii) mutate() iv) summarize() v) is.na() vi) cbind()	6	L2	CO2

	c.	Consider the dataset with two variables X and Y with values : X : [15, 20, 25, 30, 35] and Y : [10, 18, 30, 25, 22] Compute pearson and spearman correlation coefficient. Are they similar?	8	L3	CO2
Module – 3					
Q.5	a.	Discuss in detail about importing and exporting, CSV files, importing unstructured data files, XML and HTML files into R.	10	L2	CO3
	b.	Discuss in detail about importing data from JASON, YAML, Excel, SAS, SPSS and MATLAB files into R.	10	L2	CO3
OR					
Q.6	a.	Explain the concept of accessing various databases from R.	7	L2	CO3
	b.	List and explain any five R functions to manipulate string data and data frames.	5	L2	CO3
	c.	Discuss various Grouping functions in R with suitable examples.	8	L2	CO3
Module – 4					
Q.7	a.	Define Exploratory Data Analysis (EDA). Enlist the various techniques employed by EDA Data analysis.	8	L2	CO3
	b.	Give the basic syntax for creating a pie-chart and explain the parameters of the function. Illustrate it with suitable example.	6	L3	CO3
	c.	Explain the significance of scatter plots. Illustrate the creation of Scatter.plot with suitable example.	6	L3	CO3
OR					
Q.8	a.	Define Line Chart, with suitable example, explain how will you create line plot using Basic Graphics, Lattice Graphics, Ggplot2 Graphics and Geom_ribbon().	10	L2	CO3
	b.	Write a short notes on : i) Histograms ii) Box plots.	10	L2	CO3
Module – 5					
Q.9	a.	Explain the detail about the following basic statistical measure available in R i) Mean ii) Median iii) Mode iv) Standard deviation v) Quartile Ranges vi) Correlation vii) Covariance.	7	L2	CO4
	b.	List and explain in detail the four R in-built functions to generate normal distribution.	8	L2	CO4
	c.	Write a short note on Correlation Analysis.	5	L2	CO4
OR					
Q.10	a.	Illustrate in brief about Binomial Distribution. List and explain R in-built functions to Generate binomial distribution with example.	8	L2	CO4
	b.	Consider a simple of regression in predicting income of a person when his expenditure is know? Let expenditure and income is represented as vectors E and I respectively E = [1000, 1500, 2000, 2500, 3000] I = [3000, 3500, 4000, 4500, 5000] Derive a simple linear regression model to predict income for the given expenditure and predict the income, suppose if the expenditure is 2700 using the model.	12	L3	CO4