R22 Regulation *Subject code: 4O5FA*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A+' Grade)

B.Tech V Semester Regular/Supplementary Examinations, November 2025

FUNDAMENTALS OF DATA SCIENCE

(IT)

Maximum Marks: 60 Date:14.11.2025 Duration: 3 hours

Note: **1.This question paper contains two parts A and B.**
2. Part A is compulsory which carries 10 marks. Answer all questions in Part A.
3. Part B consists of 5 Units. Answer any one full question from each unit.
4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks (10X1M=10 Marks)		Marks	CO	Bloom Tx
1.a)	Define Data Science.	1M	1	L1
b)	Name any two basic data types in R.	1M	1	L2
c)	Define an attribute in the context of data types.	1M	2	L3
d)	What is the range of a data set?	1M	2	L2
e)	What is a vector in R?	1M	3	L2
f)	What function is used to create a matrix in R?	1M	3	L4
g)	Name any two logical operators used in R.	1M	4	L4
h)	What is a nested function in R?	1M	4	L2
i)	What is a pie chart used for in data visualization?	1M	5	L3
j)	Define a scatter plot in R.	1M	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	Bloom Tx
2	a) Define Data Science and explain how it differs from Big Data. b) Explain the concept of Statistical Inference and describe the relationship between populations and samples with examples.	5M 5M	1	L1 L3
	OR			
3	a) Discuss the process of model fitting in statistical modeling. b) Demonstrate the steps for setting up the R environment and write a simple R program using basic data types to perform arithmetic operations.	5M 5M	1	L2 L4
4	a) Explain the difference between discrete and continuous attributes with examples. b) Discuss the importance of measuring central tendency and explain mean, median, and mode with examples.	5M 5M	2	L2 L3
	OR			
5	a) Given a small dataset, compute the mean, median, and mode, and interpret the results.	5M	2	L2

	b) Apply suitable statistical measures to compare two datasets based on their dispersion and central tendency.	5M		L3
6	a) List and explain the steps to create and name a vector in R with an example. b) Differentiate between a matrix, an array, and a data frame in R.	5M 5M	3	L2 L4
	OR			
7	a) Discuss the process of sub setting and sorting data frames with examples. b) Write an R script to perform vector arithmetic and demonstrate vector sub setting with a sample output.	5M 5M	3	L1 L3
8	a) List and explain the relational and logical operators in R with suitable examples. b) Discuss the structure and working of iterative loops (for and while) in R with examples.	5M 5M	4	L4 L5
	OR			
9	a) Develop a recursive function in R to calculate the factorial of a given number. b) Demonstrate how to load and use an R package, and apply a built-in mathematical function in a short R program.	5M 5M	4	L6 L3
10	a) Explain the steps to create a pie chart and bar chart in R with suitable examples. b) Discuss the components of a line graph and explain how to plot multiple lines in the same graph.	5M 5M	5	L2 L3
	OR			
11	a) Write an R program to create a scatter plot for a given dataset and interpret the relationship shown. b) Apply linear regression in R to find the relationship between two numeric variables (e.g., height vs. weight).	5M 5M	5	L4 L5