Reg. No.															

Question Paper Code	14037

B.E./B.Tech.-DEGREE EXAMINATIONS, NOV/DEC 2025

Third Semester

Electronics and Communication Engineering

20ECPW301 - R PROGRAMMING WITH LABORATORY

Regulations - 2020

Duration: 3 Hours | Max. Marks: 100

PART-A (MCQ) (10 × 1 = 10 Marks)

Answer ALL Questions

		Marks	K–Level	CO
1.	Which of the following data structures in R can store elements of different types? (a) Vector (b) Matrix (c) List (d) Array	1	K1	CO1
2.	What is the output of the command class(c (1, 2, 3)) in R? (a) "integer" (b) "numeric"(c) "vector" (d) "double"	1	K2	CO1
3.	Which of the following control structures is used for decision-making in R? (a) for (b) if-else (c) while(d) repeat	1	K1	CO2
4.	What is the correct way to define a function in R? (a) function myfun(x) { return(x+1) } (b) myfun<- function(x) { return(x+1) } (c) myfun(x) = function { x+1 } (d) def myfun(x): return x+1	1	K2	CO2
5.	Which function in R is used to compute cumulative sums of a numeric vector? (a) sum() (b) cumsum() (c) cumprod() (d) prod()	1	K1	CO3
6.	The function used to find eigenvalues and eigenvectors of a matrix in R is: (a) solve() (b) eigen() (c) matrix() (d) det()	1	K1	CO3
7.	Which R function is primarily used to create basic scatter plots? (a) graph() (b) plot() (c) scatter() (d) display()	1	K1	CO4
8.	In machine learning, “Supervised Learning” refers to: (a) Learning with labeled data (b) Learning without labels (c) Reinforcement through rewards (d) Random pattern recognition	1	K2	CO6
9.	Which of the following tests is used to compare the means of two samples in R? (a) ANOVA (b) T-test (c) Chi-square test (d) Z-test	1	K1	CO4
10.	In ggplot2, which function is used to specify the background theme of a plot? (a) theme() (b) aes() (c) geom() (d) data()	1	K1	CO5

PART-B (12 × 2 = 24 Marks)

Answer ALL Questions

		Marks	K–Level	CO
11.	Define data frames and explain their purpose in R.	2	K1	CO1
12.	Differentiate between vectors and lists in R with examples.	2	K2	CO1
13.	List the uses of control statements in R programming.	2	K1	CO2
14.	Write a simple R function to find the factorial of a number using recursion.	2	K2	CO2
15.	What is the use of the apply() function family in R?	2	K1	CO3
16.	Write R code to perform matrix multiplication using the %*% operator.	2	K2	CO3
17.	List the different types of plots that can be generated using base R graphics.	2	K1	CO5
18.	Distinguish between supervised and unsupervised learning in machine learning.	2	K2	CO6
19.	Define reinforcement learning with its applications.	2	K1	CO6
20.	Bring out the purpose of correlation and covariance in statistical analysis.	2	K1	CO5
21.	What are splines in Non Linear model?	2	K1	CO4
22.	Outline the purpose of the plot() function in R?	2	K2	CO4

PART-C(6×11=66Marks)

Answer ALL Questions

23.	a)	Write an R program to create and manipulate different data structures such as vectors, lists, matrices, and data frames. Explain the output.	*11*	*K3*	*CO1*
		OR			
	b)	Apply various R functions to demonstrate how data types and variables are handled in an R session with suitable examples.	*11*	*K3*	*CO1*
24.	a)	Develop a R program that demonstrates the use of control statements, loops, and decision-making using if-else and for loops.	*11*	*K3*	*CO2*
		OR			
	b)	Write a R script that defines Quick sort function for a set of numbers along with the algorithm.	*11*	*K3*	*CO2*
25.	a)	Discuss how mathematical and statistical operations such as cumulative sums, sorting, and matrix multiplication are performed in R with examples.	*11*	*K2*	*CO3*
		OR			
	b)	Explain the process of simulating Markovs Chain to predict the business analytics.	*11*	*K2*	*CO3*
26.	a)	Analyze how R can be used to create, customize, and save different types of visualizations using the plot() function and other graphical tools.	*11*	*K4*	*CO4*
		OR			
	b)	Discuss the use of statistical tests such as T-tests, ANOVA, and correlation in R for data analysis and decision-making.	*11*	*K4*	*CO4*
27.	a)	Explain the regression models (linear, logistic, Poisson) in R with appropriate examples.	*11*	*K2*	*CO6*
		OR			
	b)	Examine the types of machine learning techniques (supervised, unsupervised, reinforcement) and their implementation in R with suitable examples.	*11*	*K2*	*CO6*
28.	a)	Develop theR program to visualize a real-world dataset (such as student performance or sales data) using various types of graphs — bar chart, histogram, scatter plot, and line chart.	*11*	*K3*	*CO5*
		OR			
	b)	Develop a R code to access the keyboard and monitor with proper syntax. Also state the difference between the print() and cat() functions.	*11*	*K3*	*CO5*