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Question Paper Code	12834
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B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2024

Fifth Semester

Information Technology

**20ITPW501 - STATISTICAL ANALYSIS USING R PROGRAMMING WITH
LABORATORY**

(Use of table ANOVA P table is permitted)

Regulations - 2020

Duration: 3 Hours

Max. Marks: 100

PART - A (10 × 2 = 20 Marks)

Answer ALL Questions

- | | Marks | K-
Level | CO |
|---|-------|-------------|-----|
| 1. Write about vectors in R. Give example. | 2 | K1 | CO1 |
| 2. Describe any three math functions in R with example. | 2 | K1 | CO1 |
| 3. Define Random Sampling. | 2 | K2 | CO2 |
| 4. What are parallel box plots? How can it be constructed in R? | 2 | K2 | CO2 |
| 5. Define Strips Charts. | 2 | K1 | CO3 |
| 6. What is meant by the term “Comparison of Variance”? | 2 | K1 | CO3 |
| 7. Define Simple Linear Regression. | 2 | K1 | CO4 |
| 8. What is Pearson Correlation? Give the corresponding R function for Pearson Correlation. | 2 | K2 | CO4 |
| 9. Define Polynomial Regression. | 2 | K2 | CO5 |
| 10. How regression can be done in tabular data? What do you mean by the term “Logistic Regression”? | 2 | K2 | CO5 |

PART - B (5 × 13 = 65 Marks)

Answer ALL Questions

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|--|----|----|-----|
| 11. a) Write about data frame in R. Write about different operations on data frame with appropriate examples. | 13 | K2 | CO1 |
| OR | | | |
| b) Describe R functions for reading a Matrix and an Array. Illustrate the R functions for manipulating Matrix and Array. | 13 | K2 | CO1 |
| 12. a) Write about Scatter Plot and Histogram with R examples. Explain its importance in graphical display of statistical data. Give appropriate examples. | 13 | K3 | CO2 |
| OR | | | |
| b) Write about different functions for probability distribution in R that can be used for statistical data analysis. | 13 | K3 | CO2 |

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze; K5 – Evaluate; K6 – Create

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13. a) What is a Box Plot? Describe the components of a Box Plot. 13 K3 CO3
 Construct Box Plot for the following data with R code
 100,95,93,100,92,95,99,100,58,75,78,45,66,89,93
 Construct the Box Plot components for the above data.

OR

- b) Explain in detail about One Sample T Test and Two Sample T Test 13 K3 CO3
 with appropriate R code and examples.
14. a) Explain Bartlett's Test with example. Can Bartlett's test be used for 13 K4 CO4
 analysis of homogeneity of variance?

OR

- b) Explain in detail about Wilcoxon Signed Rank Test with R code. 13 K4 CO4
15. a) Explain in detail about linear models and generalized linear models. 13 K4 CO5

OR

- b) Explain about Two-way ANOVA with Replication. 13 K4 CO5

PART - C (1× 15 = 15 Marks)

16. a) Implement Linear Regression model for GDP vs Sales in below data. 15 K3 CO6
 The data represents four wheeler sales with respective GDP year
 wise.
 Also predict the for wheeler sale in the year 2023 if GDP is 7.5.
 Write R code for implementing Linear Regression and Prediction.

Year	GDP	Sales
2017	6.2	26.3
2018	6.5	26.65
2019	5.48	25.03
2020	6.54	26.01
2021	7.18	27.9
2022	7.93	30.47

OR

- b) The Students taught by 3 different methods(A, B, C) gave the 15 K3 CO6
 following performance as marks:

A	19, 9, 12, 16, 7, 1,11
B	8, 13, 3, 17, 15
C	14, 11, 10, 9, 15, 16

Calculate the analysis variance.

Write the R code for implementing ANOVA to given data.