

Reg. No.:



Name:

University of Kerala

U8889

Second Semester FYUGP Degree Examination, April 2025

Discipline Specific Core Course

STATISTICS

UK2DSCSTA111 - DATA ANALYSIS USING R- I

Academic Level: 100-199

Time: 1 Hour 30 Minutes(90 Mins.)

Max. Marks: 42

Part A. 6 Marks.Time:6 Minutes.(Cognitive Level:Remember(RE)/Understand(UN)) Objective Type. 1 Mark
Each.Answer all questions

Qn No.	Question	CL	CO
1	Which function is used in R to calculate the probability mass function for a Poisson distribution?	RE	5
2	The symbolic representation of a model to be fitted given inside the lm() function is called.....	RE	1
3	The mean of a normal distribution is 12 then the mode of this distribution is _____	UN	4
4	If $0.7 \leq r \leq 1$, then we can conclude that	UN	1
5	Which R function would you use to determine the c.d.f. of t-distribution?	UN	5
6	The estimate of regression coefficient a in the regression line $y = ax + b$ is 0.756. Then state whether the following statement is true/false: "The variable y increases as x increases."	UN	3

Part B.8 Marks.Time:24 Minutes.(Cognitive Level:Understand(UN)/Apply(AP))Short Answer. 2 marks each.Answer all questions

Qn No.	Question	CL	CO
7	Explain the concept of a sampling distribution. How does it differ from the population distribution?	UN	4
8	Define coefficient of determination.	UN	1
9	The following is the output in R for fitting a simple linear regression of y on x : Coefficients: (Intercept) x 12.45 0.54 Write down the commands to be added to estimate the values of y for the given values of x as 12, 15 and 20.	AP	3
10	How can you compute the cumulative probability (CDF) of a value in a chi-square distribution in R?	AP	5

Part C. 28 Marks.Time:60 Minutes (Cognitive Level:Apply(AP)/Analyse(AN)/Evaluate(EV)/Create(CR)) Long Answer.7 marks each.Answer all 4 Questions choosing among options * within each question

Qn No.	Question	CL	CO																						
11	A) Give two examples each which validate the following relations on two characteristics. (i) increase in the value of one variable result in an increase in the value of other variable (ii) increase in the value of one variable result in a decrease in the value of another variable. OR B) Explain the application of the function qt(). Write the R program for finding the quantiles corresponding to the probabilities 0.25, 0.5, 0.75 for t distribution with degrees of freedom (a) 5 and (b) 10.	AP	1, 5																						
12	A) Analyze the significance of the normal distribution in statistical modeling. Discuss how the assumptions of normality can impact real-world data analysis in fields such as finance, healthcare, and quality control. Provide examples where the normal distribution is appropriate and where it may not be suitable. OR B) Give a brief comparison between Karl Pearson correlation coefficient and Spearman's rank correlation coefficient.	AN	4, 1																						
13	A) Evaluate why the normal distribution occupies such an important position in statistical analysis. List the important properties of normal distribution. OR B) Illustrate the use of pchisq() and dchisq() with suitable examples.	EV	4, 5																						
14	A) Explain the procedure for fitting the regression equation of the form $y = a + bx + cx^2$ in R. With the help of the following data set, write the R programme to fit the above regression equation. Use some dummy outputs (output of your imagination) for the coefficients and R^2 value, explain how you will interpret the result and how you will predict the y values for a given value of x. <table><tr><td>x</td><td>1</td><td>1</td><td>2</td><td>2</td><td>3</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td></tr><tr><td>y</td><td>2</td><td>7</td><td>7</td><td>10</td><td>8</td><td>12</td><td>10</td><td>14</td><td>11</td><td>14</td></tr></table> OR B) Using R, write the code to generate 100 random samples from a normal distribution with a mean of 50 and a standard deviation of 10. Explain each component of the code.	x	1	1	2	2	3	3	4	5	6	7	y	2	7	7	10	8	12	10	14	11	14	CR	3, 5
x	1	1	2	2	3	3	4	5	6	7															
y	2	7	7	10	8	12	10	14	11	14															