

Reg. No.:



Name:

University of Kerala

U9345

Second Semester FYUGP Degree Examination, April 2025

Multi-Disciplinary course

STATISTICS

UK2MDCSTA101 - BIVARIATE AND CATEGORICAL DATA ANALYSIS

Academic Level: 100-199

Time: 1 Hour

Max. Marks: 28

Part A ,4 Marks ,Time 5 Minutes (Cognitive Level :Remember(RE)/Understand(UN))Objective Type 1 mark each,
Answer all questions

Qn No.	Question	CL	CO
1	State whether the statement is true or false. Type I error occurs when a true null hypothesis is rejected.	RE	3
2	Scatter diagram helps us to Options : A)Study nature of relationship B)Study degree of relationship C)Both a and b D)None	RE	1
3	State TRUE or FALSE. The sign of both regression coefficients will be same.	UN	2
4	The chi-square test assumes that the observations are _____ of each other.	UN	3

Part B ,8 Marks ,Time 15 Minutes (Cognitive Level :Understand(UN)/Apply(AP))Short Answer 2 marks each, Answer all questions

Qn No.	Question	CL	CO												
5	Classify univariate and bivariate data.	UN	1												
6	Define Type 1 error.	UN	3												
7	Calculate the correlation coefficient between the following sets of data: <table><tr><td>X</td><td>2</td><td>4</td><td>6</td><td>8</td><td>10</td></tr><tr><td>Y</td><td>4</td><td>6</td><td>8</td><td>10</td><td>12</td></tr></table>	X	2	4	6	8	10	Y	4	6	8	10	12	AP	1
X	2	4	6	8	10										
Y	4	6	8	10	12										
8	What does it mean for two attributes to be independent?	AP	3												

Part C ,16 Marks ,Time 40 Minutes (Cognitive Level :Apply(AP)/Analyse(AN)/Evaluate(EV))Long Answer 4 marks each, Answer all questions choosing among options* within each question

Qn No.	Question	CL	CO
9	A) Form regression equations for X on Y and Y on X for the following data. X: 15 18 21 25 28 Y: 10 15 20 25 30	AP	2, 3

Qn No.	Question	CL	CO									
	OR B) In an experiment on immunization of cattle from tuberculosis, the following results were obtained: <table><tr><td></td><td>Affected</td><td>Unaffected</td></tr><tr><td>Inoculated</td><td>12</td><td>28</td></tr><tr><td>Not Inoculated</td><td>13</td><td>7</td></tr></table> Apply chi-square test to examine the effect of vaccine in controlling the incidence of the disease.		Affected	Unaffected	Inoculated	12	28	Not Inoculated	13	7		
	Affected	Unaffected										
Inoculated	12	28										
Not Inoculated	13	7										
10	A) In a group of 10 persons, the regression equations of age(X) and the blood sugar level(Y) are: $x - y - 3 = 0$ and $5x - 8y + 15 = 0$. Identify the regression lines and find the correlation coefficient. OR B) Compare Karl Pearson's Correlation and Spearman's Rank Correlation in terms of assumptions, applicability, and interpretation.	AN	2, 1									
11	A) The following data relate to experience of machine operators and their performance ratings. Operator experience in years (X) : 16 12 18 10 Performance ratings (Y): 87 88 89 80 Form a regression equation and also evaluate the performance rating if the operator has 20 years of experience. OR B) A medical study examines the relationship between exercise frequency (continuous variable) and mental well-being (ranked score from 1 to 10). The researchers calculate: Pearson's correlation: $r = 0.35$. Spearman's correlation: $\rho = 0.60$. Evaluate why Spearman's correlation is stronger than Pearson's in this case and determine which result is more meaningful.	EV	2, 1									
12	A) The data given below shows the relationship between X and Y .Draw a scatter diagram. Analyze the pattern of data points. Justify your answer X: 1 2 3 4 5 6 Y: 12 18 22 27 35 42 OR B) Consider the observations of marks of 10 students in Mathematics(X) in Statistics(Y) are given as:	CR	1, 2									

Qn No.	Question										CL	CO	
	X	59	65	45	52	60	62	70	55	45			49
	Y	75	70	55	65	60	69	80	65	59			61
	1. Construct the regression equations of Y on X and X on Y. 2. Estimate the mark of a student in Mathematics if he scores 72 marks in Statistics.												