

Reg. No.:



Name:

University of Kerala

U8893

Second Semester FYUGP Degree Examination, April 2025

Discipline Specific Core Course

STATISTICS

UK2DSCSTA104 - BEHAVIOURAL DATA ANALYTICS-II

Academic Level: 100-199

Time: 2 Hours(120 Mins)

Max. Marks: 56

Part A.6 Marks:Time 5 Minutes.(Cognitive Level :Remember(RE)/Understand(UN)) Objective Type.1 mark each, Answer all questions

Qn No.	Question	CL	CO
1	If A and B are independent then $P(A/B)=$	RE	3
2	The probable error (PE) of correlation coefficient (r) is calculated using the formula	RE	1
3	When Yule's coefficient of association (Q) is +1, it indicates? Options : A)Perfect negative association B)No association C)Perfect positive association D)Weak association	UN	2
4	What is the probability of getting 6 when an unbiased die is thrown? Options : A)1/6 B)1/3 C)3/4 D)2/3	UN	3
5	If two variables have a perfect increasing relationship, the value of Spearman's correlation coefficient will be	UN	1
6	The normal probability curve between the ordinates $X = \mu - 3\sigma$ and $X = \mu + 3\sigma$ covers approximately ---- % of the total observations	UN	4

Part B.10 Marks.Time:20 Minutes (Cognitive Level:Understand(UN)/Apply(AP))Two-three sentences.2 marks each.Answer all questions

Qn No.	Question	CL	CO
7	Explain the idea of exhaustive events with an example.	UN	3
8	What are the advantages of rank correlation?	UN	1
9	If regression coefficient of y on x =0.67 ,variance of x= 5 and correlation coefficient= 0.37 , then find variance of y.	AP	1
10	If $f(x)=\frac{x}{15}$ for $x = 1,2,3,4,5$ is a probability density function, then find a) $P(x=2 \text{ or } 3)$ b) $P(x \geq 4)$	AP	3
11	Sketch the graph of standard normal distribution and shade the region corresponding to $ Z > 2$.	AP	4

Part C.16 Marks.Time:35 Minutes.(Cognitive Level :Apply(AP)/Analyse(AN))Short Answer.4 marks each, Answer all 4 questions,choosing among options * within each question

Qn No.	Question	CL	CO												
12	A) What is the area under a standard normal curve from the ordinates a) -1 to 1 and b) 1 to 3? OR B) Obtain the rank correlation and comment the nature of the correlation. <table><tr><td>X</td><td>2.5</td><td>3.1</td><td>6.8</td><td>9.8</td><td>4.1</td></tr><tr><td>Y</td><td>6.5</td><td>4.4</td><td>2.8</td><td>3.1</td><td>5.06</td></tr></table>	X	2.5	3.1	6.8	9.8	4.1	Y	6.5	4.4	2.8	3.1	5.06	AP	4, 1
X	2.5	3.1	6.8	9.8	4.1										
Y	6.5	4.4	2.8	3.1	5.06										
13	A) From the data given below Calculate Yule’s coefficient of association between weight of the children and then economic condition and interpret it . <table><tr><td></td><td>Poor children</td><td>Rich children</td></tr><tr><td>Below Normal weight</td><td>85</td><td>20</td></tr><tr><td>Above Normal weight)</td><td>6</td><td>47</td></tr></table> OR B) Let X be a discrete random variable with the following PMF $f(x)=\begin{cases} 0.1, & \text{if } x = 0.2 \\ 0.2, & \text{if } x = 0.4 \\ 0.2, & \text{if } x = 0.5 \\ 0.3, & \text{if } x = 0.8 \\ 0.2, & \text{if } x = 1 \\ 0, & \text{elsewhere} \end{cases}$ Find a) P(X≤0.5) b) P(0.25<X<0.75)		Poor children	Rich children	Below Normal weight	85	20	Above Normal weight)	6	47	AP	2, 3			
	Poor children	Rich children													
Below Normal weight	85	20													
Above Normal weight)	6	47													
14	A) Distinguish between Z- score and Stanine score. OR B) A discrete random variable has the following probability function <table><tr><td>X</td><td>-1</td><td>0</td><td>1</td></tr><tr><td>f(x)</td><td>k</td><td>2k</td><td>3k</td></tr></table> Calculate P(X=0), P(X>o) and P(X<1).	X	-1	0	1	f(x)	k	2k	3k	AN	4, 3				
X	-1	0	1												
f(x)	k	2k	3k												
15	A) Examine the consistency of the given data . N= 60, (A) = 51, (B) = 32, (AB) = 25. . OR B)	AN	2, 1												

Qn No.	Question	CL	CO
	The equations of two lines of regression, obtained in a correlation analysis between variables X and Y are as follows: $2X + 3Y - 8 = 0 \text{ and } 2Y + X - 5 = 0.$ The variance of X = 4. Identify the regression lines and find variance of Y.		

Part D.24 Marks.Time: 60 Minutes.(Cognitive Level :Analyse(AN)/Evaluate(EV)/Create(CR)) Long Answer 6 Marks each.Answer all 4 questions choosing among options * within each question

Qn No.	Question	CL	CO									
16	A) The following data gives the effect of measles immunizing vaccination on 12 month care and cohort infant. Calculate the coefficient of association between vaccination and immunization. Justify your answer . Immunization <table><tr><td></td><td>Vaccinated</td><td>Not vaccinated</td></tr><tr><td>Suffered from measles</td><td>6</td><td>56</td></tr><tr><td>Do not suffered from measles)</td><td>84</td><td>18</td></tr></table> OR B) The rank of a same 10 students in two subjects are given below (3,3),(5,2),(6,9),(2,8),(7,6), (10,2),(2,10),(1,10),(6,5)and (9,7) find the rank correlation. Interpret the result.		Vaccinated	Not vaccinated	Suffered from measles	6	56	Do not suffered from measles)	84	18	AN	2, 1
	Vaccinated	Not vaccinated										
Suffered from measles	6	56										
Do not suffered from measles)	84	18										
17	A) The regression equations of X on Y and Y on X are $10X+3Y = 25$ and $6X+5Y=31$. The variance of X is 4. Find(i) Mean of X and Y(ii) Predict the value of Y when $X =2$.(iii)Predict the value of X when $Y = 1$. OR B) If $P(A) = p_1$, $P(B)=p_2$ and $P(A \text{ and } B) =p_3$.Then find the probability of (a) A' and B'(b) A' or B' (c) A' or B.	EV	1, 3									
18	A) For a normal distribution 17% of the items are below 30 and 17% are above 60. Find the mean and variance of the distribution. OR B) Given $(AB) = 25$, $(\alpha\beta) = 17$, $(A\beta) = 6$ and $(\alpha B) = 5$. Calculate the coefficient of colligation and hence use the result, find the Yule's coefficient of association.	EV	4, 2									
19	A) Calculate the coefficient of association between intelligence in father and son from the following data and create a contingency table. Intelligent father with intelligent son = 248, Intelligent father with dull son = 81, Dull father with intelligent son = 92 and Dull father with dull son = 579 OR B) Box A contains 4 white and 3 red balls. Box B contains 2 white and 5 red balls(Boxes are identical). One of the boxes is to be chosen at random and a ball is to be selected from the chosen bag.What is the probability of drawing a white ball by analysing all the possibilities .Give an example of mutually exclusive events in this case.	CR	2, 3									