Reg. No.: .....

Name: .....

University of Kerala

U9160

Second Semester FYUGP Degree Examination, April 2025

Discipline Specific Core Course

STATISTICS

UK2DSCSTA109 - STANDARD DISTRIBUTIONS, CORRELATION AND REGRESSION

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	What is the probability mass function of a Poisson distribution.	RE	4
2	State whether following statement is true or false. Normal curve is mesokurtic.	RE	5
3	The expression for finding the moment generating function of a discrete random variable X is …….	UN	3
4	Scatter diagram help us to Options : A) Study nature of relationship B)Study degree of relationship C) Both D)None	UN	1
5	If X follows a discrete uniform distribution over {1,2,…,10}, what is E(X)?	UN	4
6	All odd order central moments of the normal distribution are ……..	UN	5

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	The correlation coefficient between two random variables X and Y is +1 . Comment on the relation between X and Y?	UN	1
8	Describe the importance of normal distribution.	UN	5
9	A biased coin with a probability of heads being 0.4 is tossed 6 times. What is the probability of getting at least 4 heads?	AP	4
10	X is a normally distributed random variable with mean 50 and variance 100. Find the probability of 1) X≥ 62 and 2) X≤ 40.	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) The weekly wages of workmen are normally distributed with a mean of rupees 70 and a standard deviation of rupees 5. Estimate the probability that weekly wages will be a) Between rupees 70 and 72 b) Between 69 and 72 c) More than rupees 75. OR B) If $f(x,y) = 6x^2y, 0 < x < 1, 0 < y < 1$	AP	5, 2

Qn No.	Question	CL	CO
	, examine whether X and Y are independent. Also determine E(X + Y) .		
12	A) The mean yield for one acre plot is 662 kilos with a standard deviation 32 kilos. Assuming the yield follows normal distribution, find the probability that the yield from a plot is a) Over 700 kilos b) Below 650 kilos. Using these probabilities, find how many one acre plots in a batch of 1000 plots can be expected to have these yields. OR B) Determine rank correlation coefficient for the data. X: 47 52 52 52 54 56 58 59 60 60 Y: 25 27 28 29 32 32 33 34 35 35	AN	5, 1
13	A) Evaluate E(X) for a continuous random variable X with distribution function F(x) = 0, for $x \leq 0$; $\frac{x}{8}$ for $0 < x \leq 2$; $\frac{x^2}{16}$ for $2 \leq x \leq 3$. OR B) The marks of a set of students for a certain subject are normally distributed with mean 62 and standard deviation 3. What is the probability of a student getting less than 60% marks? If we need to find the probability that 3 out of 4 randomly chosen students have less than 60% marks, which distribution can be used? Find this probability.	EV	1, 5
14	A) Define a normal distribution. Write down the pdf of a normal distribution with mean 8 and standard deviation 3. Draw a rough frequency curve of this distribution and comment on its skewness and kurtosis. OR B) Ten competitors in a beauty contest are ranked by three judges as follows. Judges A (x) : 6, 5 , 3, 10 , 2, 4 , 9 , 7 , 8 ,1 Judges B (y) : 5 , 8 , 4 , 7, 10 , 2 , 1 , 6 , 9 , 3 Judges C(z): 4 , 9 , 8 , 1 , 2 , 3 , 10 , 5 , 7 , 6 How can we compare the approaches of these judges to the concept of beauty? If we want to compare the judging pattern of these judges, which measure can be used? Use that measure of comparison and identify which pair of judges has nearest approach to common taste of beauty?	CR	5, 1