

Reg. No.:



Name:

University of Kerala

W6919

Third Semester FYUGP Degree Examination, November 2025

Discipline Specific Core Course

STATISTICS

UK3DSCSTA208-STATISTICAL INFERENCE

Academic Level: 200-299

2024 Admission

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	The test used for comparing two population variances is:	RE	4
2	Define power of the test	RE	3
3	Give an example where t-test is applicable.	UN	4
4	Which condition must be satisfied for the CLT to apply?	UN	1
5	Level of significance lies between ____ and ____	UN	3
6	A hypothesis specifying the population completely is called: Options : A)Null hypothesis B)Simple hypothesis C)Composite hypothesis D)Alternative hypothesis	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	Distinguish between type 1 and type 2 errors.	UN	3
8	Explain the chi-square test for testing the significance of variance	UN	4
9	Differentiate between point estimate and interval estimate	AP	2
10	If X has the standard normal distribution, what is the distribution of its square?	AP	1

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)	AP	3

Qn.No.	Question	CL	CO
	Two machines produce ball bearings. A sample of 15 bearings from machine 1 has variance 0.0025, and from machine 2 a sample of 12 bearings has variance 0.0016. Test at 5% significance whether the variances are equal (use F-test). Compute F and state conclusion. OR B) A population is known to follow the normal distribution with mean 2 and S.D 3. Find the probability that the mean of a sample of size 16 taken from this population will be greater than 2.5		
12	A) A random sample of size $n=100$ has mean $\bar{X}=60$ and a standard deviation $s=10$. (i) Find a 95% confidence interval for the population mean μ. (ii) Interpret the result. OR B) Two random samples of size 15 and 25 are taken from a $N(\mu, \sigma)$. Find the probability that the ratio of the sample variances does not exceed 2.28	AN	2
13	A) The continuous random variable X has the frequency function $f(x) = 1/\Theta \quad 0 \leq x \leq \Theta.$ It is desired to test the hypothesis $H_0: \Theta=1$ against $H_1: \Theta=2$ using a single observation x. Evaluate significance level and power If critical region is $x \geq 0.5$. and also when critical region is $1 \leq x \leq 1.5$ OR B) a) Explain Interval estimation b) A sample of 11 circuits from a large normal population has a mean resistance of 2.20 ohms. We know from past testing that the population	EV	3

Qn.No.	Question	CL	CO
	standard deviation is 0.35 ohms. Determine 95 % confidence interval for the mean resistance of the population		
14	A) Establish the inter relationship between t, chi square and F statistics OR B) B) If s^2 is the variance of a sample of size 10 taken from a normal population with standard deviation 5. Find the probability that s^2 will be between 8.4 and 42.3	CR	1