QP CODE: D3BST2401	(Pages: 2)	Reg. No : .....
		Name : .....

THIRD SEMESTER FYUGP EXAMINATION, NOVEMBER 2025

Discipline Specific Core (DSC) Course - Minor

STA3MN201 : Statistical Inference using R

(Credits: 4)

Time: 2 Hours **Maximum Marks: 70**

Section A

Answer the following questions. Each carries 3 marks (Ceiling: 24 marks)

1.	What are the properties of sufficient estimator?	BL1	CO1, CO2
2.	Give an example for an estimator which is not unbiased but consistent.	BL1	CO1, CO2
3.	Give the 99% confidence interval for the mean of a normal population when S^2 = 16, $\bar{x} = 49$ and n = 100	BL2	CO2, CO3
4.	If X follows an exponential distribution with parameter θ. Obtain the moment estimator for θ.	BL2	CO1
5.	Define the term critical value.	BL1	CO4
6.	Define efficient estimator	BL1	CO1, CO2
7.	Why mode is not directly calculated by default in R?	BL1	CO5
8.	How is a scatter diagram created in R using the plot() function?	BL1	CO5
9.	Write down the syntax to create histogram in R for the following data:	BL2	CO5

Class	0-10	10-20	20-30	30-40	40-50
Frequency	3	8	15	10	6

10.	Create a matrix of order 4*3 by using cbind and rbind.	BL2	CO5

(PTO)

Section B			
Answer the following questions. Each carries 6 marks (Ceiling: 36 Marks)			
11.	What are the properties of a good estimator? Describe any two properties.	BL1	CO1, CO2
12.	A survey finds that 48 out of 120 college students prefer online learning over in-person classes.Compute a 90% confidence interval for the proportion of college students who prefer online learning.	BL2	CO2, CO3
13.	A survey claims that 60% of adults support a new tax policy. A recent poll of 200 adults found that 132 support it. At the 0.05 significance level, test the claim that more than 60% of adults support the policy.	BL3	CO6
14.	Describe the procedure for testing independence of attributes.	BL1	CO6
15.	What are the advantages of R programming?	BL2	CO5
16.	How is variance calculated in R ? Provide an example.	BL2	CO5
17.	A company claims that the average lifespan of its light bulbs is 1000 hours. A consumer agency tests 50 bulbs and finds the mean life span is 980 hours with a standard deviation of 60 hours.Test the claim at the 0.05 level of significance.	BL3	CO6
18.	Find the maximum likelihood estimator of p from a B(N,p) distribution.	BL2	CO1
Section C			
Answer any one question. Each carries 10 marks (1 x 10 = 10 Marks)			
19.	(a) Define unbiasedness. (b) If (X_1 , X_2 , . . . , Xn) follows B(1,p), Show that $T(T-1)/n(n-1)$ is an unbiased estimator p^2 , where $T = \sum x$.	BL2	CO1, CO2
20.	The police comminssioner believes that 20 percent of the police calls are false alarms. 70 percent are true but non-critical and 10 percent are criticl. A sample of 80 calls on verification shows that 20 were false, 40 were non-critical and 20 were critical. Was the commissioner's original assumption correct? (Use Chi-square test)	BL3	CO6
	CO : Course Outcome		
	BL : Bloom's Taxonomy Levels (1 – Remember, 2 – Understand, 3 – Apply, 4 – Analyse, 5 – Evaluate, 6 – Create)		