24U3129 (Pages: 2) Name : .....

Reg. No : .....

THIRD SEMESTER UG DEGREE EXAMINATION, NOVEMBER 2025

(FYUGP)

CC24USTA3MN201 - STATISTICAL INFERENCE USING R

(Statistics - Minor Course)

(2024 Admission - Regular)

Time: 2.0 Hours Maximum: 70 Marks

Credit: 4

Part A (Short answer questions)

Answer ***all*** questions. Each question carries 3 marks.

1. Describe the relative efficiency of an estimatos t1 with respect to t2. [Level:2] [CO1]
2. Compare sufficiency with unbiasedness in the context of estimator properties. [Level:3] [CO1]
3. Determine whether the sample mean is an unbiased estimator for the population mean in a given dataset. [Level:3] [CO1]
4. Define the terms population and sample in statistics. [Level:2] [CO1]
5. Define interval estimation and explain how it differs from point estimation. [Level:3] [CO1]
6. Interpret the meaning of the statement “A composite hypothesis does not specify the distribution completely.” [Level:2] [CO2]
7. Discuss situations where the Chi-Square test is used in statistics. [Level:3] [CO3]
8. Describe the use of the rbind() and cbind() functions in data input. [Level:2] [CO4]
9. Explain how to create a histogram in r using r codes. [Level:2] [CO4]
10. Calculate the total of the following numbers: (50, 20, 30, 40, 100) by using r code. [Level:2] [CO4]

(Ceiling: 24 Marks)

Part B (Paragraph questions/Problem)

Answer ***all*** questions. Each question carries 6 marks.

11. Given that 120 out of 500 people favor a policy, compute the 95% confidence limits for the population proportion. [Level:3] [CO1]
12. Illustrate with an example how an estimator can be biased but still consistent. [Level:2] [CO1]

13. Determine the 95 % confidence interval for mean of a normal population when population standard deviation is unknown and n is large. [Level:3] [CO1]

14. Explain why the normal distribution is used in large-sample tests of hypotheses concerning the mean. [Level:2] [CO2]

15. Describe the meaning of hypothesis testing in the context of a large population proportion. [Level:2] [CO2]

16. Illustrate with an example how the Chi-Square test compares observed and expected frequencies. [Level:2] [CO3]

17. Explain how Chi-Square distribution is used in testing the independence of attributes. [Level:2] [CO3]

18. Illustrate with an example how median() works in R when the dataset has an odd and even number of observations. [Level:2] [CO4]

(Ceiling: 36 Marks)

Part C (Essay questions)

Answer any ***one*** question. The question carries 10 marks.

19. Apply the MLE method to estimate the mean of a normal distribution with known variance from sample data. [Level:3] [CO1]

20. (i) Decribe significance level of the test and power of the test. [Level:2] [CO2]

(ii) Let X follows B(10, P). Consider the following test for testing H0: P = 1/2 and H1: p =1/4. Accept H0 if x > 2. Find the significance Level and power of the test.

(1 × 10 = 10 Marks)

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