**24U3107** (Pages: 2) Name : .....

Reg. No : .....

**THIRD SEMESTER UG DEGREE EXAMINATION, NOVEMBER 2025**

(FYUGP)

**CC24USTA3MN209 - STATISTICAL INFERENCE**

(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. Explain standard error. [Level:2] [CO1]
2. Define central limit theorem. [Level:2] [CO1]
3. Explain Sample and statistic with an example. [Level:2] [CO1]
4. Explain the meaning of a confidence interval in interval estimation. [Level:2] [CO2]
5. Define what is an estimator. [Level:2] [CO2]
6. Define a two-tailed test in hypothesis testing. [Level:2] [CO3]
7. Explain the difference between Type I error and Type II error. [Level:2] [CO3]
8. Explain when a large sample test for mean is appropriate. [Level:2] [CO3]
9. What are the basic conditions required for the Chi-square test to be valid? [Level:2] [CO4]
10. In a chi-square test, how are the degrees of freedom calculated. [Level:2] [CO4]

**(Ceiling: 24 Marks)**

**Part B** (Paragraph questions/Problem)

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

11. Find the sampling distribution of sample mean. [Level:2] [CO1]
12. Summarize the principles of sampling. [Level:2] [CO1]
13. Describe the difference between a point estimate and the parameter it estimates. [Level:2] [CO2]
14. Describe why consistency is important for an estimator. [Level:2] [CO2]

15. A sample of 400 observations were taken from a population with S.D. 15. If the mean of the sample is 27, test whether the hypothesis that the mean of the population is equal to 24 against that mean is less than 24. (Significance level= 0.05) [Level:2] [CO3]

16. Describe the meaning of hypothesis testing in the context of a large population proportion. [Level:2] [CO3]

17. Explain the assumptions that must be satisfied for the Chi-square test for independence to be valid. Why is it important to check these assumptions before proceeding with the test? [Level:2] [CO4]

18. Discuss the application of the Chi-square test. [Level:2] [CO4]

**(Ceiling: 36 Marks)**

**Part C** (Essay questions)

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

19. Describe the terms: [Level:2] [CO3]
    (i) Size of the test.
    (ii) Type I and Type II errors.
    (iii) Rejection Region.
    (iv) One tailed and two tailed test.

20. A production process claims output proportions of A = 0.4, B = 0.35, C = 0.25. In a sample of 200, observed counts were 78, 70, 52. Test the claim using Chi-Square. [Level:3] [CO4]

**(1 × 10 = 10 Marks)**

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