


RAN-2403081803011001
M. Sc. (Applied Statistics) (Sem. - III) Examination October - 2025
Core-1 Course 301 : Statistical Inference - III
Time: 3 Hours]
[Total Marks: 70
સૂચના : / Instructions

- (1) ઉપરોક્ત દર્શાવેલ વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
Fill up strictly the above details on your answer book.
- (2) Attempt all questions
- (3) Attempt any 2 bit of each question
- (4) Each question carries 14 marks.
- (5) Use of scientific calculator and statistical table are permitted.

Seat No.:

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Student's Signature

- Q. 1.** a. Discuss the main assumptions underlying non-parametric tests. How do these assumptions make them suitable for real-world data analysis in social sciences?
b. Write the real-life applications of non-parametric test.
c. Why are non-parametric tests preferred when dealing with small sample sizes? Support your answer with an applied research scenario.
- Q. 2.** a. Explain the logic of the Binomial test. In which situations is it most appropriately applied?
b. Explain the application of the Kolmogorov-Smirnov test for comparing two population distributions.
c. Differentiate between the Chi-square goodness of fit test and the Kolmogorov-Smirnov test in testing distributional assumptions.
- Q. 3.** a. Explain difference between Kendall Tau and kendall's concordance Test.
b. Which test can be used when we have more than two groups and data in dichotomous form. Explain in detail.
c. Explain the significance of the Spearman rank correlation coefficient. How does it differ from Pearson's correlation?
- Q. 4.** a. Explain Theil-Sen Regression Method in detail.
b. Discuss in detail the Fisher Exact Probability Test for a 2×2 contingency table. Derive the exact probability formula and explain its logic under hypergeometric distribution. Compare its use with Chi-square and explain why Fisher's test is suitable for small samples.
c. Describe the Extension of Median Test and explain how it would be used to compare median of preferences across different groups. What are the advantages of using this test over Kruskal-Wallis Test?
- Q. 5.** a. Derive the test statistic of Cochran's Q Test for binary responses in k related samples. Explain its relationship with the McNemar Test.
b. Explain Difference between Dunn and Dunn control.
c. Explain the Steel-Dwass Test. How does it differ from the Dunn Test and in what situations would you prefer to use the Steel-Dwass Test.