



QP CODE: 25804505



25804505

Reg No :

Name :

INTEGRATED M.Sc DEGREE EXAMINATION, OCTOBER 2025

Ninth Semester

INTEGRATED M.Sc BASIC SCIENCE-STATISTICS

CORE - IST9CR03 - NON-PARAMETRIC INFERENCE

2020 ADMISSION ONWARDS

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Time: 3 Hours

Weightage: 30

Part A (Short Answer Questions)

*Answer any **eight** questions.*

Weight 1 each.

1. Write down different types of Q-Q plots.
2. Define empirical distribution function.
3. What do you mean by parametric tests?
4. Write the null and alternative hypotheses for Wald- Wolfowitz two sample runs test.
5. Write the null and alternative hypotheses for chi- square test for independence of attributes.
6. Define Shapiro- Wilk test.
7. What do you mean by Kruskal-Wallis test?
8. What do you mean by Jackknife technique in Non parametric test?
9. What is Bootstrap method in Non parametric test?
10. Define Nonparametric regression.

(8×1=8 weightage)

Part B (Short Essay/Problems)

*Answer any **six** questions.*

Weight 2 each.

11. Briefly explain Order Statistics.
12. What are the benefits and limitations of Kaplan Meier estimator?
13. Briefly explain single sample run test.
14. Seasonal rainfall at a district for 25 years is given below test whether the sequence is random. The sequence is: 25.34, 49.35, 39.62, 42.90, 57.66, 24.89, 50.63, 52.63, 38.47, 43.25, 50.83, 22.06, 22.04, 24.31, 45.13, 42.83, 46.94, 57.50, 30.70, 48.37, 38.45, 44.00, 50.03, 30, 54.2, 56.





15. Briefly explain one sample K-S test.
16. Automotive development Engineers are testing the properties of two antilock braking systems. In order to determine whether they exhibit any significant difference in the stopping distance achieved by different cars. The systems are fitted to 10 cars and a test is run ensuring that which system is used in each car under conditions which are as uniform as possible. The stopping distance obtained as given in the table.

Car	1	2	3	4	5	6	7	8	9	10
X	27.7	32.1	29.6	29.2	27.8	26.9	29.7	28.9	27.3	29.9
Y	26.3	31.0	28.1	28.1	27.9	25.8	28.2	27.6	26.5	28.3

17. Distinguish between Perfect Concordance and Perfect Discordance.
18. Distinguish between Histograms and Kernel Density Estimators.

(6×2=12 weightage)

Part C (Essay Type Questions)

Answer any **two** questions.

Weight 5 each.

19. Derive the cumulative distribution function of smallest and largest order statistics.
20. Compare between Cramer-Von Mises test and Anderson-darling test.
21. Two teachers A and B teach the same topic to two sets of students and the scores in the examination are as follows.
Teacher A : 81,75,92,78,78,87,83,94,73,79,82,88,72,81,97,84,67,63,77,84,86.
Teacher B : 77,63,75,84,85,68,70,73,90,82,62,65.
Test the hypothesis that there is no difference in the effectiveness of teaching of the two teachers by a classical test.
22. What is bias-variance tradeoff? And also explain its applications.

(2×5=10 weightage)

