24U309S (Pages: 2) Name: .....

Reg.No: .....

THIRD SEMESTER B.Sc. DEGREE EXAMINATION, NOVEMBER 2025

(CBCSS - UG)

CC19USTA3C02 - PROBABILITY DISTRIBUTIONS AND PARAMETRIC TESTS

(Statistics - Complementary Course)

(2019 to 2023 Admissions - Supplementary/Improvement)

Time : 2.00 Hours Maximum : 60 Marks

Credit : 3

Part A (Short answer questions)

Answer ***all*** questions. Each question carries 2 marks.

1. What is the relationship between the mean and variance of binomial distribution?
2. Define Poisson distribution.
3. Write the probability density of a normal variate with mean 20 and Standard deviation 4.
4. Define Standard normal variate.
5. Define a systematic sample.
6. State any two disadvantages of stratified random sampling.
7. Distinguish between left tailed tests and right tailed tests.
8. Identify the test and write down the critical region for the test $H_0 : \mu_1 = \mu_2$ against $H_1 : \mu_1 < \mu_2$, where μ_1, μ_2 are population means.
9. Write down the null and alternative hypothesis in testing the equality of proportions
10. Identify the test and write down the critical region for the test $H_0 : \mu = 25$ against $H_1 : \mu \neq 25$
11. The mean difference between 9 paired observation is 15 and standard deviation of difference is 5. Find the value of t statistic used in paired t test.
12. How are tests for correlation is interpreted?

(Ceiling: 20 Marks)

Part B (Short essay questions - Paragraph)

Answer ***all*** questions. Each question carries 5 marks.

13. In a binomial distribution , mean = 6 and standard deviation = $\sqrt{3}$. Write down its binomial distribution.
14. If X is a poisson variate and $P(X = 0) = P(X = 1) = k$. Find 'k'.
15. Write down the procedure for testing the hypothesis
16. Develop the large sample test for testing of a hypothesis concerning mean of a population.

17. In a sample of 100 people the number of those suffering from T.B was found to be 5. Does this contradict the assumption that the proportion of T.B patients in the whole population is less than 0.04.

18. The heights of six randomly chosen sailors are in inches 63, 65, 68, 69, 71 and 72. Those of 10 randomly chosen soldiers are 61, 62, 65, 66, 69, 69, 70, 71, 72, and 73. Discuss the light that these data throw on the suggestion that sailors are on the average taller than soldiers.

19. The following are the marks obtained by 10 students in an examination 43, 48, 65, 57, 31, 60, 37, 48, 78, 59. Test the hypothesis that the population variance is 100.

(Ceiling: 30 Marks)

Part C (Essay questions)

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

20. Height of a students are normally distributed with mean = 160 cm. and Standard deviation = 5 cm. Find the probability that height of a student is
    (i) more than 165 cm.
    (ii) less than 155 cm.
    (iii) between 162 cm and 170 cm

21. Test whether the following samples come from normal populations with same variance.

Sample A	60	65	55	58	66	59	70	72
Sample B	63	66	58	49	60	61	69	71

(1 × 10 = 10 Marks)

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