

22U309

(Pages: 2)

Name: .....

Reg.No: .....

**THIRD SEMESTER B.Sc. DEGREE EXAMINATION, NOVEMBER 2023**

(CBCSS - UG)

(Regular/Supplementary/Improvement)

**CC19U STA3 C02 - PROBABILITY DISTRIBUTIONS AND PARAMETRIC TESTS**

(Statistics - Complementary Course)

(2019 Admission onwards)

Time : 2.00 Hours

Maximum : 60 Marks

Credit : 3

**Part A** (Short answer questions)

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

1. Give an example for binomial distribution.
2. Give any two examples of Poisson distribution.
3. If X follows poisson distribution with mean 2, find the variance of X.
4. Define Central Limit Theorem.
5. Define a cluster sample.
6. What is meant by a statistical hypothesis? Give an example.
7. Distinguish between left tailed and right tailed tests.
8. Write a note on p value.
9. Identify the test and write down the critical region for the test  $H_0 : \mu = 150$  against  $H_1 : \mu < 150$ .
10. 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  $\mu_1, \mu_2$  are population means.
11. Identify the test and write down the critical region for the test  $H_0 : \mu = 20$  against  $H_1 : \mu < 20$ .
12. What is test for correlation?

**(Ceiling: 20 Marks)**

**Part B** (Short essay questions - Paragraph)

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

13. Determine the binomial distribution for which mean = 6 and variance = 4. Also find  $P(X=3)$ .
14. If X is normally distributed with mean 10 and variance 16. Find  $P(15 < X < 23)$ .
15. Distinguish between sampling and non-sampling errors.

16. The records of a certain hospital showed the birth of 723 males and 617 females in a certain week. Do these conform to the hypothesis that the sexes are born in equal proportions.
17. Before an increase in excise duty on tea 400 people out of a sample of 500 persons were found to be tea drinkers. After an increase in duty 400 persons were found to be tea drinkers in a sample of 600 people. Examine whether there is any significant decrease in consumption of tea .
18. An IQ test was administered to 5 persons before and after they were trained. The results are as follows

Before training	110	120	123	132	125
After training	120	118	125	136	121

Test whether there is any change in IQ after the training programme.

19. Pumpkins were grown under two experimental conditions. Two random samples of 11 and 9 pumpkins show sample s.d. of their weights as 0.8 and 0.5 respectively. Assuming the weight distributions are normal test the hypothesis that the true variances are equal.

**(Ceiling: 30 Marks)**

**Part C (Essay questions)**

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

20. Explain the properties of normal distribution.
21. In a certain experiment to compare the two types of animal foods A and B, the following results are observed.

Food A 49 53 51 52 47 59 52 53

Food B 52 55 52 53 50 54 54 53

Assuming that the two samples of animals are independent, can we conclude that Food A is better than Food B?

**(1 × 10 = 10 Marks)**

\*\*\*\*\*