23U309

(Pages: 2)

Name: ....

Reg.No: ....

THIRD SEMESTER B.Sc. DEGREE EXAMINATION, NOVEMBER 2024

(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. If a discrete random variable $X \sim B(6, p)$. find (i) Mean of 'X' (ii) Variance of 'X'

2. State the mean and variance of poisson distribution with parameter λ.

3. Write the probability density of a normal variate with mean 20 and Standard deviation 4.

4. Write the density function of standard normal variate.

5. Distinhuish between population and sample.

6. Define parameter. Give an example

7. Define 1) Standard error 2) Critical region

8. Define: 1) Level of significance 2) Power of a test

9. Write down the test statistic for testing the significant difference between mean of a specified population in case of large sample test.

10. Write down the test statistic for testing the hypothesis that a proportion has a specified value.

11. Write down the null and alternative hypothesis in paired t test.

12. Explain the test for variance of a normal population.

(Ceiling: 20 Marks)

Part B (Short essay questions - Paragraph)

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

13. If X follows poisson law such that P(X=1)= P(X=2). Find the mean and variance. Also find P(X=4).

14. X is a normal variate with mean 60 and variance 140. Find the probability that

    (i) $X \geq 65$

    (ii) $68 \leq X \leq 74$

15. Distinguish between sampling and non-sampling errors.

16. Two samples of people consisting of 400 and 500 individuals have mean heights 171.3 and 165.3 cms with variances 40 and 37.5 respectively. Examine whether the populations from which the samples are taken have the same mean.

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. A sample of size 8 from a normal population with s.d. 3 is 6, 8, 11, 5, 9, 11,10,12. Examine whether the population mean is 7

19. From a class o f 20 children, 10 were chosen at random and given orange juice each day for a certain period. The remaining 10 were given a ration milk. The gain in weights (in pounds) were:

Group A	4	2	3	4	5	6	2	3	2	1
Group B	2	1	3	5	2	3	2	5	1	4

Test whether variance of group A is greater than that of group B

(Ceiling: 30 Marks)

Part C (Essay questions)

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

20. In a seed validity test 450 seeds are placed on a filter paper in rows of 5. The number of seeds that germinated in each row were counted and the following results were obtained.

No. of germinated seeds per row	0	1	2	3	4	5
No. of rows	0	1	11	30	38	10

Fit a binomial distriburion to the above data and compute the theoretical frequencies.

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

Sample A	24	27	24	23	25	-
Sample B	29	30	28	31	22	24

(1 × 10 = 10 Marks)

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