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D.K.M. COLLEGE FOR WOMEN (AUTONOMOUS), VELLORE-1
SEMESTER EXAMINATIONS
JUNE – 2022
ALLIED : MATHEMATICAL STATISTICS - II

21CAST2A

Time: 3 Hours

Max. Marks: 75

SECTION – A (10 x 2 = 20)

Answer ALL the questions.

1. Define Poisson distribution.
2. Write a short note on Normal distribution.
3. Write the characteristic function of Chi-square distribution.
4. What is Null hypothesis?
5. Define 2x2 contingency table with example.
6. Explain the method of moments.
7. List the characteristics of estimators.
8. State Type I and Type II error.
9. State likelihood ratio test.
10. What is the meaning of likelihood function?

SECTION – B (5 x 5 = 25)

Answer ALL the questions.

11. (a) Find M.G.F of a Poisson distribution.

(Or)

- (b) Derive the recurrence formula for the moments of the normal distribution.

12. (a) Explain the parameters and statistics of Sampling.

(Or)

- (b) State and prove the additive property of chi-square variates.

13. (a) The theory predicts that the population of beans in four groups should be 9:3:3:1 . In an examination with 1600 beans, the numbers in the four groups were 882, 313, 287 and 118. Does the experimental result support the theory?

(Or)

- (b) Out of 20 patients who were given a particular injection 18 survive. Test the hypothesis that a survival rate in a population is 85%.

14. (a) State and prove Crammer Rao Inequality.

(Or)

- (b) Write the applications of F- distribution.

15. (a) Obtain the estimators of μ and σ^2 by the method of moments for normal distribution.

(Or)

- (b) Derive the invariance property of Consistent Estimators.

SECTION – C (3 x 10 = 30)

Answer any THREE of the following questions.

16. Derive the Moments of Binomial distribution.

17. Derive the Student's t distribution with $n -$ degrees of freedom.

18. The following table gives the number of aircraft accident that occur during the various days of the week.

<i>Days</i>	<i>Sun</i>	<i>Mon</i>	<i>Tue</i>	<i>Wed</i>	<i>Thurs</i>	<i>Fri</i>	<i>Sat</i>	<i>Total</i>
<i>No. of accident</i>	<i>14</i>	<i>16</i>	<i>8</i>	<i>12</i>	<i>11</i>	<i>9</i>	<i>14</i>	<i>84</i>

Find whether the accidents are uniformly distributed over the week.

19. Explain about the sufficient estimator for the normal population with mean θ and variance unity and show that sample mean is unbiased, consistent, efficient and sufficient for θ .

20. State and Prove Neymann Pearson lemma.

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