D3BST1801 (S3)   (PAGES 2)   Reg. No:...........................

Name: ....

THIRD SEMESTER B.Sc. DEGREE EXAMINATION, NOVEMBER 2022

(Supplementary 2018 Admission)

STATISTICS: COMPLEMENTARY COURSE FOR MATHEMATICS & C.S.

ASTA3C03T: STATISTICAL INFERENCE

Time: 3 Hours   **Maximum Marks: 80**

PART A: Answer *All* the questions. Each carries 1 mark.

1. Which are the two main parts of statistical inference ?

2. What is meant by sampling distribution ?

3. What is the meaning of the sampling distribution of sample mean when sampling from a population which follows $N(\mu, \sigma^2)$.

4. What is meant by an estimator ?

5. Define power of a test.

6. Give an estimator which satisfy all the four desirable characteristics of a good estimator.

7. Define confidence coefficient.

8. What is meant by confidence limits ?

9. Define large sample tests.

10. Give the test statistic used for testing the significance of population proportion.

11. Which test is used for testing the independence of attributes ?

12. Which test is used for testing the equality of variances ?

(12 x 1 = 12 Marks)

PART B: Answer *All* the questions. Each carries 2 marks.

13. Distinguish between parameter and statistic.

14. Give any two statistics following chi square distribution.

15. Define t distribution.

16. What is meant by unbiased estimator ?

17. Define consistency of an estimator.

18. Give the 100(1-α)% confidence interval for population proportion 'p' when a large sample is drawn from a normal population.

19. A random sample of size 100 has mean 45 and standard deviation 15. Find the 95% confidence interval for the population mean μ.

20. Define null hypothesis and alternative hypothesis.

21. Define most powerful test.

(9 x 2 = 18 Marks)

(PTO)

PART C: Answer any *Five* questions. Each carries 6 marks.

22. Distinguish between standard deviation and standard error. Give the standard error of sample mean when sampling from a normal population.

23. What are the applications of chi square distribution ?

24. Explain the method of maximum likelihood estimation.

25. Distinguish between point estimation and interval estimation.

26. What is the $100(1-\alpha)\%$ confidence interval for population mean when

    i) population standard deviation is known and sample size is large.

    ii) population standard deviation is unknown and sample size is small.

27. Distinguish between one tailed and two tailed tests.

28. The mean life of 100 light bulbs produced by a company is found to be 1570 hours with a standard deviation of 120 hours. The company claims that the average life of the bulbs produced by the company is 1600 hours. Test whether the claim of the company is acceptable at 5% level.

29. In a survey of 70 business firms it is found that 45 were planning to expand their capacities next year. Does the sample information contradict the hypothesis that 70% of the firms in general are planning to expand next year? Use the test for population proportion.

(5 x 6 = 30 Marks)

PART D: Answer any *Two* questions. Each carries 10 marks.

30. Derive the sampling distribution of sample mean when sampling from a normal population with mean μ and variance σ^2.

31. Describe the desirable characteristics of a good estimator.

32. Fit a Poisson distribution for the following data and test for the goodness of fit.

x:	0	2	2	3	4
f:	123	59	14	3	1

(2 x 10 = 20 Marks)