D 72409

(Pages : 3)

Name..................................

Reg. No.............................. 87

THIRD SEMESTER B.Sc. DEGREE EXAMINATION, NOVEMBER 2014

(UG-CCSS)

Complementary Course—Statistics

ST 3C 03—STATISTICAL INFERENCE

Time : Three Hours   Maximum : 30 Weightage

Part A

Answer all questions.
Each question carries ¼ weightage.

Fill in the blanks :

1. Moment generating function of Chi-square distribution with 10 degrees of freedom is ————.

2. If X has F-distribution with (n, m) degrees of freedom, then the distribution of X^{-1} is ————.

3. Probability of first kind of error is called ————.

4. Range of variation of Student's t-distribution is ————.

State True *or* False :

5. Population variance is an example for a statistic.

6. Bias of an estimator is always positive.

7. Consistency is a large sample property.

8. Equality of variances of two normal populations can be tested by F-statistic.

Choose the correct answer :

9. Student's t distribution is :

   (a) Positively skewed.   (b) Negatively skewed.

   (c) Symmetric.   (d) None of the above.

10. If T is a consistent estimate of θ, then :

    (a) T is a consistent estimator θ^2.

    (b) T^2 is a consistent estimator of θ.

    (c) T^2 is a consistent estimator of $\theta - 1$.

    (d) None of the above.

11. In large sample test for testing the equality of proportions, the test statistic follows :

    (a) Normal distribution.   (b) t-distribution.

    (c) F-distribution.   (d) Chi-square distribution.

Turn over

12. The maximum likelihood estimator are necessarily :

    (a) Unbiased.

    (b) Sufficient.

    (c) Most efficient.

    (d) None of the above.

    (12 × ¼ = 3 weightage

Part B

Answer all nine questions.
Each question carries 1 weightage.

13. 13.Distinguish between parameter and statistic.

14. Define Student's *t*-statistic.

15. What do you meant by standard error ?

16. If X_1, X_2, is a random sample of size three taken from a population with mean μ and variance σ compare the efficiencies of the estimators $X_1 + X_2$ and $3X_1 - 2X_2$.

17. State the Fisher Neyman factorization theorem for sufficiency.

18. What are the properties satisfied by maximum likelihood estimator ?

19. Estimate the parameters of the binomial distribution if the mean of the sample is 6 an variance 3/2.

20. Distinguish between simple and composite hypothesis.

21. What do you meant by two sided test ?

(9 × 1 = 9 weightag

Part C

Answer any five questions.
Each question carries 2 weightage.

22. Define chi-square statistic and give its probability density function

23. State the relation between chi-square and F-distribution.

24. Discuss the applications *t*-distribution

25. If T is an unbiased estimate of a parameter μ, check whether T^2 is unbiased for $μ^2$.

26. Obtain the maximum likelihood estimator of the parameter λ of Poisson distribution based on sample values 6, 2, 1, 9, 4, 2,3.

27. Describe the method moments estimation.

28. Explain the general procedure for parametric interval estimation.

(5 × 2 = 10 weighta

88.

Part D

Answer any **two** *questions.*
Each question carries 4 weightage.

29. What are the desirable properties to be satisfied by a good estimate ? Give *one* example each of estimates possessing each of the desirable properties.

30. Obtain the most powerful test for testing $H_0 : \theta = \theta_0$ against $H_0 : \theta = \theta_1$, where θ is the parameter of a distribution having pdf $f(x) = \theta x^{\theta-1}, 0 < x < 1, \theta > 0$.

31. Explain Chi-square test for goodness of fit.

$(2 \times 4 = 8 \text{ weightage})$