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SVS- 336 B-18

B.Sc. Vth Semester Degree Examination

MATHEMATICAL STATISTICS

(Theory Of Estimation And C - Language)

Paper -V (5.1)

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

Instructions to Candidates:

Statistical tables and graph sheets will be supplied on request.

SECTION-A

I. Answer **ALL** the questions. **(15×1=15)**

1. Determining a single value from a sample for the parameter is known as
   a. Vital statistics b. Point estimation
   c. Interval estimation d. Designs
2. The likelihood function L is such that
   a. $0<L<1$ b. $0<L<\infty$ c. $-\infty<L<\infty$ d. none
3. Efficiency of an estimator t is
   a. Directly proportional to V(t) b. Inversely proportional to V(t)
   c. Independent of V(t) d. None
4. If a consistent estimator exists, then
   a. It is unique b. There exist 5 such estimators
   c. There exist many such estimators d. None
5. Confidence co efficient is generally given by
   a. α b. β c. $1-\beta$ d. $1-\alpha$
6. In C-program, main () function is
   a. Compulsory b. Not compulsory
   c. a choice by programmer d. None.

7. In C-language the statement CONTINUE is

   a. Valid b. Invalid c. Unknown d. None

8. Back slash constant '\a' means

   a. Back space b. System alarm c. New line d. None

9. An input function in C is

   a. Input b. Read c. Read f d. Sean f

10. If statement is a

    a. Looking statement b. Conditional control statement

    c. Relational operator d. Conditional operator

11. A sample is a group of items drawn from ----------

12. A specific value of the estimator is called ----------

13. Sufficient statistic is determined by the help of ---------- theorem.

14. C-language is developed by ---------- and ---------- in 1972.

15. An equivalent form of $\frac{a^3}{\sqrt{b^3}}$ in C is ----------

SECTION - B

II. Answer any **FIVE** of the following. **(5×5=25)**

16. Define sufficiency. Give the statement of the theorem used for determing the sufficient estimator.

17. Let x_1, x_2, x_3 be a random sample from a population, with mean μ and variance σ^2 consider two estimates for μ

    $T_1 = 2x_1 + 3x_3 - 4x_2$ and $T_2 = \frac{1}{3}(\lambda x_1 + x_2 + x_3)$

    i. Is T_1 an unbiased estimate?

    ii. Find λ such that T_2 is unbiased for μ

    iii. Which is the best estimate?

18. Determine M.L.E$_s$ for the parameters α and β of the rectangular distribution with

    p.d.f. $f(x;\alpha,\beta) = \begin{cases} \frac{1}{\beta - \alpha}, \alpha \le x \le \beta \\ 0, \text{otherwise} \end{cases}$

19. Explain the method of moments.

20. Describe the character set of C- language.

21. Define constants in C. Discuss their types with examples.

22. Evaluate the following expressions

    i. 4* ((i/3 + 4* (j + 2)) ; given i = 16, j = 10

    ii. k_1 + (l * 3 + 5/k) ; given k = 2, l = 3.

SECTION - C

III. Answer any **FOUR** of the following. **(4×10=40)**

23. If T_1 is a minimum variance unbiased estimator (having variance. σ^2) and T_2 is any other unbiased estimator with variance $\frac{\sigma^2}{e}$, then show that the correlation between T_1 and T_2 is $\sqrt{e}$.

24 If $x_1, x_2, \ldots\ldots, x_k$ is a random sample from p.m.f. $\rho(x) = n C_x, \rho^x (1-\rho)^{n-x}$; x = 0, 1, 2, ...n, then find

    i. M.L.E. of the parameter ρ.

    ii. Variance of this M.L.E.

25. Use the method of moment for estimating the parameters in

    i. $f(x;\theta) = (1+\theta)\theta^x; 0 \le x \le 1, \theta > 0.$

    ii. $f(x;\theta) = {}_nC_x \theta^x (1-\theta)^{n-x}; x = 0,1,2,\ldots\ldots n \& \theta > 0.$

26. Obtain 95% confidence interval for β in $f(x;\beta) = \beta^x e^{-\beta x}$; $0 \le x \le \infty$.

27. Describe IF and SWITCH statements.

28. Draw flow chart and write C-program to find average and standard deviation of a frequency distribution.
