May-June 2006

Bachelor of Computer Application (BCA) Examination

II Semester

Statistical Methods

Time 3 Hours]   [Max. marks 40

Note : *Attempt all five questions. Each question carries equal marks.*

1. Explain the method of maximum likelihood. State the properties of the maximum likelihood estimator.

    OR

    State and prove Cramer-Rao Inequality. Let $x_1, x_2, \ldots\ldots x_n$ be a random sample from $N(\mu, \sigma^2)$ where σ^2 is known. Obtain M. V. U. E. for μ.

2. State and prove Neyman-Pearson Lemma. Use it to derive the most powerful test of $H_0 : \theta = \theta_0$ against $H_1 : 0 = \theta_1$, where θ is the mean of a normal distribution whose variance is known.

    OR

    Explain the following terms with suitable examples :

    (a) Simple hypothesis and Composite hypothesis :

    (b) Critical region and Power of the test.

3. Random samples drawn from two countries gave the following data relating to the heights of adult males :

	Country A	Country B
Mean height in inches	67.42	67.25
Standard deviation	2.58	2.50
Number in samples	1000	1200

    (a) Is the difference between the means significant?

    (b) Is the difference between the standard deviations significant?

    OR

    Below are given the gain in weights (in lbs.) of pigs fed on two diets A and B :   Gain in Weight

    Diet A : 25, 32, 30, 34, 24, 14, 32, 24, 30, 31, 35, 25

    Diet B : 44, 34, 22, 10, 47, 31, 40, 30, 32, 35, 18, 21, 35, 29, 22

    Test, if the two diets differ significantly as regards their effect on increase in weight.   [Given Tabulated $t_{0.05} (25) = 2.06$].

4. What do you mean by non parametric method ? What are the disadvantages of non-parametric methods over parametric methods?

OR

Describe the Wilcoxon Signed Rank Test.

5. What is the Analysis of Variance? Discuss the methods of analysis of variance for one-way classified data.

OR

Explain the analysis of a Randomized Block Design and compare its efficiency with Completely Randomized Block Design.

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