M.Sc. BIOSTATISTICS EXAMS
FIRST YEAR
PAPER III – STATISTICAL INFERENCE, SAMPLING METHODS AND SAMPLE SIZE

Q.P. Code: 282863

Time: Three hours   **Maximum: 100 Marks**

I. Elaborate on: (2 x 20 = 40)

1. a) Write about stratified, systematic, quota and snowball sampling.

    b) Write about cluster sampling and compare it with simple random sampling.

2. a) Suppose that $y_1, y_2, \ldots y_n$ denote a random sample from Poisson distribution with mean λ.

    i)   Find MLE $\hat{\lambda}$ for λ.
    ii) Find the expected value and variance for $\hat{\lambda}$.
    iii) What is the MLE for $P(Y = 0) = \exp(-\lambda)$?

    b) Write about parametric and non-parametric tests based on t and F distributions.

II. Write notes on: (10 x 6 = 60)

1. Correlation and regression.

2. Sample size on difference between two means.

3. Regression estimator.

4. Intra class correlation coefficient (ICC).

5. Properties of an estimator.

6. Rank sum test.

7. State Rao-Blackwell and Cramer-Rao inequality.

8. Multiphase sampling.

9. Confidence interval for a single mean.

10. MVUE and BLUE.

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