ST JOSEPH'S UNIVERSITY, BENGALURU -27
M.Sc. STATISTICS – 4th SEMESTER
SEMESTER EXAMINATION: APRIL 2024
(Examination conducted in May / June   2024)
STDE 0323: BIOSTATISTICS
(For current batch students only)

Time: 2 Hours   **Max Marks: 50**

This paper contains ONE printed page and ONE part

PART-A

Answer any **FIVE** of the following.   10 X 5 = 50

1. A) Describe in details how to construct the likelihood function for type I censoring.

    B) Define Survival function with examples and state its properties.   (5+5)

2. A) Define residual lifetime. Derive the function of expected residual lifetime (*T*).

    B) Explain the actuarial method to estimate the survival function and derive the

    variance of the estimator.   (5+5)

3. State and prove the Kaplan-Meier estimator is GMLE.   (10)

4. A) Derive the sample size determination under power analysis for the one sample test for

    the mean.

    B) Discuss the method of likelihood ratio test to compare two exponential distributions.

                                                                                         (5+5)

5. Write a brief note on the different types of phases of a clinical trial.   (10)

6. Define competing risk with an example. Discuss the competing risks as a bivariate random

    variable and latent failure time approach.   (10)

7. Define Cumulative Incidence Function (CIF). Derive maximum likelihood estimation of the

    CIF. Also, find variance and confidence interval for the CIF estimator.   (10)

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