

THIRD SEMESTER M.Sc. DEGREE EXAMINATION, NOVEMBER 2021

STATISTICS
FMST3E06-BIOSTATISTICS

Time: 3 Hours

Maximum Weightage: 30

Part A: All questions can be answered. Each carries two weightage (Ceiling 6 weightage).

1. Give any two examples of statistical problems in Biomedical Research.
2. Obtain the hazard rate for $U [0, 1]$ and show that it is an increasing function of x .
3. Explain the Type I and Type II censoring in survival analysis.
4. Discuss the problem of non-identifiability in the competing risk models.
5. What do you mean by stochastic epidemic models?
6. Explain the terms natural selection and mutation?
7. What do you mean by Randomized Clinical Trials?

Part B: All questions can be answered. Each carries four weightage (Ceiling 12 weightage).

8. Obtain the relation between failure rate, survival function and probability density function?
9. Explain the procedures of Cox's F –test.
10. Obtain the MLE for the mean of the exponential distribution under type I and type II censoring.
11. Distinguish between phenotypic and assertive mating .
12. Explain the non parametric testing problem in competing risk.
13. Explain how the frequency of a sex-linked gene approaches equilibrium under random mating.
14. Explain Hardy- Weinberg equilibrium.

(P.T.O.)

Part C: All questions can be answered. Each carries six weightage (Ceiling 12 weightage).

15. Explain the various types of biological data in the biomedical research and describe the principles of Biostatistical design in medical studies.
16. Explain the Kaplan-Meier estimation method. Mention its advantages and disadvantages.
17. Explain the following:
 - (a) Gehan's generalized Wilcoxon test
 - (b) Cox-Mantel test
 - (c) Logrank test
18. Compare the Phase I, Phase II and Phase III trials with respect to their design and analysis.