



JAX-MS-301

Seat No. _____

M. Sc. (Statistics) (Sem. III) (CBCS) Examination

December – 2019

**MS - 301 : Survival Analysis & Clinical Trials
(Theory)**

Time : $2\frac{1}{2}$ Hours]

[Total Marks : 70

Instructions :

- (i) Attempt all questions.
- (ii) Each question carries equal marks.

1 Answer the following : (Any Seven) 14

1. Define censoring.
2. Define decreasing Hazard rate.
3. In order censoring number of failure is _____ for study.
4. Define increasing failure rate.
5. Define constant failure rate.
6. Type-I censoring is also known as _____.
7. Define cumulative hazard function.
8. Write the probability density function of Linear Failure Rate distribution.
9. Write c.d.f. of Pareto distribution.
10. Define clinical trials.

2 Answer the following. (Any Two) 14

1. Explain Type-II censoring with example.
2. Find failure rate function of Gamma distribution.
3. Explain the Phases of Clinical Trials.

3 Answer the following : 14

1. Discuss Cox proportional hazard model and their link functions.
2. Explain following terms of clinical trials :
 - i. Plan of study
 - ii. Study Population

OR

- 3 Answer the following : 14
1. Explain Kaplan-Meier estimator for survival function.
 2. Discuss actuarial method for censored data.
- 4 Answer the following : (Any Two) 14
1. Discuss Clinical Development Plan in clinical trials
 2. Derive Hazard function of Weibull distribution.
 3. Explain Type-I censoring with example.
- 5 Answer the following : (Any Two) 14
1. Explain Nonparametric Estimation of the Survival Function for uncensored data.
 2. Explain graphical procedure for estimating the parameters of Weibull distribution.
 3. Find MLE of Exponential Distribution.
 4. Explain following terms:
 - i. Survival function
 - ii. Failure rate function
 - iii. Mean residual life function.
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