



P-MS-301

Seat No. _____

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

May / June - 2018

MS - 301 : Statistics

(Survival Analysis & Clinical Trials)

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

[Total Marks : 70

Instructions : (1) Attempt all questions.
(2) Each question carries equal marks.

- 1** Answer the following questions : (any **seven**) **14**
- (1) Define censoring.
 - (2) Define clinical trials.
 - (3) Define increasing failure rate.
 - (4) Define cumulative hazard function.
 - (5) Write c.d.f. of Pareto distribution.
 - (6) Define decreasing hazard rate.
 - (7) In order censoring number of failure is _____ for study.
 - (8) Write the probability density function of Linear Failure Rate distribution.
 - (9) Type-I censoring also known as _____.
 - (10) Define constant failure rate.
- 2** Answer the following questions : (any **two**) **14**
- (a) Explain Type-I censoring with example.
 - (b) Discuss actuarial method for censored data.
 - (c) Explain the Phases of Clinical Trials.
- 3** Answer the following questions : **14**
- (a) Find failure rate function of Gamma distribution.
 - (b) Discuss Cox proportional hazard model and their link functions.

OR

- 3** Answer the following questions : **14**
- (a) Derive Hazard function of Weibull distribution.
 - (b) Explain following terms of clinical trials :
 - (i) Plan of study
 - (ii) Study Population
- 4** Answer the following questions : (any two) **14**
- (a) Find MLE of Exponential Distribution.
 - (b) Explain graphical procedure for estimating the parameters of Weibull distribution.
 - (c) Discuss Clinical Development Plan in clinical trials.
- 5** Answer the following questions : (any two) **14**
- (a) Explain Type-II censoring with example.
 - (b) Explain following terms :
 - (i) Survival function
 - (ii) Failure rate function
 - (iii) Mean residual life function.
 - (c) Explain Kaplan-Meier estimator for survival function.
 - (d) Explain Nonparametric Estimation of the Survival Function for uncensored data.
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