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

November / December – 2017

MS-301 : 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 : (any **seven**)   **14**

(1) Define cumulative hazard function.

(2) Define increasing failure rate.

(3) In order censoring number of failure is _____ for study.

(4) Write the probability density function of Linear Failure Rate distribution.

(5) Define decreasing Hazard rate.

(6) Type-I censoring also known as _____

(7) Define constant failure rate.

(8) Write c.d.f. of Pareto distribution.

(9) Define clinical trials.

(10) Define censoring.

2   Answer the following : (any **two**)   **14**

(a) Discuss Clinical Development Plan in clinical trials.

(b) Explain Type-I censoring with example.

(c) Discuss actuarial method for censored data.

3   Answer the following :   **14**

(a) Explain Type-II censoring with example.

(b) Find failure rate function of Gamma distribution.

OR

3 Answer the following : **14**

    (a) Explain Nonparametric Estimation of the Survival Function for uncensored data.

    (b) Derive Hazard function of Weibull distribution.

4 Answer the following : (any **two**) **14**

    (a) Find MLE of Exponential Distribution.

    (b) Explain graphical procedure for estimating the parameters of Weibull distribution.

    (c) Explain following terms :

        (i) Survival function

        (ii) Failure rate function

        (iii) Mean residual life function.

5 Answer the following : (any **two**) **14**

    (a) Discuss Cox proportional hazard model and their link functions.

    (b) Explain the Phases of Clinical Trials.

    (c) Explain Kaplan-Meier estimator for survival function.

    (d) Explain following terms of clinical trials:

        (i) Plan of study

        (ii) Study Population.

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