

[This question paper contains 2 printed pages.]

Sr. No. of Question Paper : 6703 **D** Your Roll No.....

Unique Paper Code : 237302

Name of the Course : **B.Sc. (Hons.) Statistics**

Name of the Paper : STHT-303 : Applied Statistics – II

Semester : III

Duration : 3 Hours

Maximum Marks : 75

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt **six** questions. Q. No. 7 is compulsory.
3. Attempt **five** more from **Section A** and **B**, selecting at least **two** from each Section.
4. Use of simple calculator is allowed.

SECTION A

1. (a) Distinguish between :
 - (i) short term and long term fluctuations,
 - (ii) additive and multiplicative decompositions in time series analysis.(b) What are the different growth curves used for measuring trend ? Outline the criteria for selecting a modified exponential curve as the trend type. Explain method of three selected points for fitting this curve. (5,8)
2. (a) Describe Yule's and Hotelling's methods for fitting the logistic curve.
(b) Describe the method of moving averages for fitting the series if it consists of a quadratic polynomial in a time variable. Further show that $[2k + 1, 2] = [2k + 1, 3]$ where symbols have their usual meaning. (5,8)
3. (a) Explain what is meant by seasonal fluctuations of a time series. Describe the method of 'ratio to trend' for measuring the seasonal indices in time series data, stating clearly the assumptions made in this method.
(b) Describe the variate difference method. How is it used for finding the degree of the polynomial with which the trend component of a series can be represented ? (5,8)

P.T.O.

SECTION B

4. (a) When sample size is small discuss the construction and analysis of appropriate control charts for controlling process average and process variability.
- (b) Discuss the significance of rational sub-grouping. What role does it play in control chart analysis ? (6,7)
5. (a) A company manufactures small metal brackets. They are packaged in containers of 1000 brackets each. At the unloading facility, 10 containers have arrived and 36 brackets are selected at random from each container. The fraction non-confirming in each sample is 0.0, 0.0, 0.0, 0.1, 0.02, 0.02, 0.06, 0.0, 0.0, and 0.0
- (i) Do the data from this shipment indicate statistical control ?
- (ii) What is the minimum sample size that would give a positive lower control limit for this chart ?
- (b) Distinguish between 'defective' and 'defect'. Set up control charts for controlling the defects, giving clearly the statistical concept used. (6,7)
6. (a) Distinguish between :
- (i) acceptance-rejection and acceptance-rectification plans
- (ii) process and product control
- (b) What is an OC curve ? Plot its ideal form. Highlight the important points on this curve and discuss its role in deciding about the quality of the lot.
- (c) Discuss the lot quality protection approach to decide the sample size and acceptance number in respect to single sampling plan. (5,5,3)

SECTION C

7. (a) Write a short note on the office of registrar general highlighting its main functions and major publications (at least two each).
- (b) (i) Describe two methods of population enumeration.
- (ii) What are the two heads under which the Statistics of Industrial production is collected in India ?
- (iii) Name the central coordinating agency and its ministry dealing with agricultural statistics in India. (4,6)