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Your Roll No.....

Sr. No. of Question Paper : 5803 H

Unique Paper Code : 237302

Name of the Paper : Applied Statistics – II

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

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 any six questions in all.
3. Q. No. 7 is compulsory and the remaining five questions are to be attempted from Sections A and B, selecting at least two from each section.
4. Use of simple calculator is allowed,

SECTION A

1. (a) Name the characteristic movement of time series with which you will mainly associate the following with suitable justification.

P.T.O.

- (i) fall in production of rice due to floods,
- (ii) an era of recession,
- (iii) increase in literacy rate in a developing country,
- (iv) a continually increasing demand for smaller automobiles,
- (v) issue of library books during examinations.

(b) Name different types of mathematical curves used in fitting trend to economic time series giving the mathematical reason for deciding the type of trend to be fitted to given time series data. Explain method of three selected points for fitting any one of the growth curves. (5,8)

2. (a) Discuss the method of moving averages for estimating the trend in a time series. Obtain the trend values for a time series of extent $m=2k+1$ if it consists of a quadratic polynomial in time variable.

(b) Explain what is meant by seasonal fluctuations of a time series. Describe the method of 'Ratio-to-trend' for measuring the seasonal variations, stating clearly the assumptions made. (5,8)

3. (a) "Output of many industries follows logistic trend." Justify the statement. Trace the curve and describe its different phases with respect to a time series data regarding production in various years.
- (b) Why is the residual method not an appropriate method to measure random component in time series data? Describe variate difference method and discuss how it is used to measure random component. (5,8)

SECTION B

4. (a) When all sample points lie within 3σ limits and follow random pattern the process is said to be in statistical control. Discuss the interpretation of control charts for variables, for different non-random patterns.

(b) Discuss various control charts for controlling process average and process variability when quality characteristic is a variable. (5,8)

5. (a) What are modified control limits, explain how they are derived? Why it is required to construct modified control limits?

(b) What are control charts for attributes? Derive control charts for controlling the proportion defectives when sample size is variable, giving clearly the statistical concept used. (5,8)

6. (a) Distinguish between :

(i) *Process* and product control

(ii) A.Q.L and L.T.P.D.

(b) Obtain \bar{OC} , ATI and AOQ functions for a single sampling plan for attributes. Discuss the average quality protection approach to decide the sample size and acceptance number in respect to this plan. (5,8)

SECTION C

7. (a) Write a short note on the N.S.S.O highlighting its main functions and major publications.
- (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 co-ordinating agency and its ministry dealing with Agricultural Statistics in India. (4,6)