2018
STATISTICS-PAPER-II

Time Allowed : 3 Hours   Full Marks : 200

If the questions attempted are in excess of the prescribed number, only the questions attempted first up to the prescribed number shall be valued and the remaining ones ignored.

Answers may be given either in <u>English</u> or in <u>Bengali</u> but all answers must be in one and the same language.

Group - A

Answer <u>any ten</u> questions
10x10

1. (a) Distinguish between 3σ limits and probability limits.

(b) Describe the technique of sampling inspection by variables for the normal distribution case.

(c) Define, with examples, the following terms in theory of reliability : (i) Reliability and (ii) Stress and Strength.

(d) Derive Gini's coefficient of concentration for log-normal distribution.

(e) Describe the variate difference method for determining the order of polynomial.

(f) Discuss, with examples, the different components of a time series.

(g) Explain the important formulas for the calculation of price index numbers with merits and demerits.

(h) Discuss the effect of eliminating trend by the moving average on the other components of a time series.

(i) Discuss the different steps in the construction of wholesale price index number in India.

(j) Explain the uses of index numbers with merits and demerits.

(k) Distinguish between GRR and NRR.

(l) Define CDR. Mention its defects. What is its remedy?

(m) Discuss a method of estimation of forecasting the production of a crop, say, paddy in West Bengal.

(n) Discuss the functions of CSO and mention some of its publications.

(o) Explain the structure of a complete life table.

Group-B

Answer <u>any five</u> questions
20x5

2. What is relative growth rate of a population? Stating suitable assumption(s) on this rate, derive logistic equation and mention its important properties.

3. Define μ_x, the force of mortality at age x. Derive Makeham's formula in this connection, stating suitable assumptions and give an outline a method of fitting this formula.

4. Describe single and double sampling inspection plans for attributes in acceptance - rectification scheme. Discuss how the plan parameters are determined here.

5. Discuss the following :

i) p-chart and c-chart when standards are not given.

ii) p-chart for varying sample sizes.

iii) R-chart when standards are given.

6. Describe a sequential procedure for item-wise inspection from a lot having proportion of defectives p $(o < p < 1)$ such that the probability of accepting the lot at quality $p = p_o$ is $(1 - \alpha)$ and that at $p = p_1$ is β, $o < p_o < p_1 < 1$ and $o < \alpha, \beta < 1$. Discuss the merit of this procedure.

7. Describe link relative method for measuring seasonal fluctuations. What are its merits and demerits. Discuss different types of seasonal patterns and discuss one method for tackling them.

8. What is a chain index? Discuss its advantages and disadvantages over a fixed-base index number. Define Fisher's ideal index number. Show that it satisfies factor reversal test and time reversal test.

9. Write short note on :

   i) Abridged Life Table.

   ii) Lorenz Curves.