



WEST BENGAL STATE UNIVERSITY

B.Sc. General Part-III Examination, 2020

STATISTICS

PAPER-STSG-IV-A

Time Allotted: 2 Hours

Full Marks: 50

The figures in the margin indicate full marks.

Candidates should answer in their own words and adhere to the word limit as practicable.

All symbols are of usual significance.

GROUP-A

Answer any *one* question from the following

$5 \times 1 = 5$

1. Briefly describe the components of time series with example. 5
2. What is an index number? Discuss how you choose a base period while constructing price index number. 2+3
3. Distinguish between ‘seasonal variation’ and ‘cyclical variation’ in time series analysis with examples. 5
4. What is control chart? Explain the basic principles underlying the control charts. 5
5. Define time series with example. What purpose is served by analyzing a time series? 2+3
6. ‘GRR can be regarded as an upper bound of NRR’. Explain. Also discuss the equality case. 4+1

GROUP-B

Answer any *three* questions from the following

$15 \times 3 = 45$

7. (a) Describe different methods for determining trend in a time series. Examine the merits and demerits of these methods. 10+5
- (b) What are the uses of time series?

8. (a) Define cost of living index number. Describe different steps in construction of cost of living index number. 10+5
(b) Discuss the importance and limitations of index numbers.
9. (a) What are factor reversal and time reversal tests for consistency of an index number? Show that an index number satisfies both the test. 10+5
(b) Describe different errors in measurement of price index.
- 10.(a) Discuss, in detail, the ratio-to-trend method for determining seasonal indices for monthly data. 10+5
(b) Explain the additive and multiplicative models of a time series stating clearly the assumptions.
- 11.(a) Distinguish between defect and defective. Give some examples of defect for which the c -chart is applicable. 7+8
(b) Describe the construction of a c -chart with stating assumptions involved in the calculation.
- 12.(a) Define crude birth rate, age specific fertility rate, general fertility rate and total fertility rate and also discuss their merits and demerits. 10+5
(b) What are the uses of a complete life table?
- 13.(a) Explain the construction of a control chart of \bar{X} . 8+7
(b) Prove that

$$(i) L_x = \frac{l_x + l_{x+1}}{2} \quad (ii) L_x = \frac{-dx}{l_x p_x}$$

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