

U.G. 4th Semester Examination - 2020**STATISTICS****[GENERIC ELECTIVE]****Course Code : STAT(H)-GE-T-04****(Applied Statistics)**

Full Marks : 40

Time : $2\frac{1}{2}$ Hours*The figures in the right-hand margin indicate marks.**Candidates are required to give their answers in their own words as far as practicable.*

1. Answer any **five** questions: $2 \times 5 = 10$
- a) Write down the multiplicative model of a time series explaining the notations used.
 - b) What is meant by the statement: For a set of commodities the price index number of 1988 with respect to 1960 as base is 211.35?
 - c) Why is Fisher's index number formula called ideal?
 - d) What are different causes of variation in the context of statistical quality control?
 - e) What are the drawbacks of Laspeyres' price index number formula?

- f) What is product control?
- g) What is a complete life table?
- h) What is meant by saying that the *NRR* for a country is 1.3?

2. Answer any **two** questions: $5 \times 2 = 10$
- a) Explain the 'time reversal' and 'factor reversal' tests of index numbers. Examine whether Paasche's and Fisher's price index numbers satisfy these tests.
 - b) Show that Laspeyres' price index number is a weighted arithmetic mean of price relatives. Comment on the bias of this formula with justification.
 - c) How can Gross Reproduction Rate and Net Reproduction Rate measure reproduction rate of a community? Prove that for any community the Net Reproduction Rates is necessarily less than the Gross Reproduction Rate.
 - d) Distinguish between process control and product control. Explain the rationale behind Shewhart's control chart technique.

3. Answer any **two** questions: $10 \times 2 = 20$

- a) Discuss different steps of constructing the consumer price index number of a given community of people.
- b) Give example of a time series from real life exhibiting a clear upward trend first and then a downward trend. Discuss any method of determining trend of a time series.
- c) What is the difference between 'defect' and defective'? Describe the construction of control charts for number of defects when the standard is not given.
- d) What do you understand by sampling inspection plans? How are they used in controlling the quality of a manufactured product? Discuss different types of acceptance sampling plans.
