T(4th Sm.)-Statistics-G(GE/CC-4)/CBCS

# 2021

## STATISTICS — GENERAL

### Paper : GE/CC-4

## (Applications of Statistics)

#### Full Marks : 50

The figures in the margin indicate full marks. Candidates are required to give their answers in their own words as far as practicable.

All notations and symbols have their usual meanings.

1. Answer any five of the following :

(a) Write down the standard error of sample proportion to estimate the population proportion under SRSWOR.

- (b) Show that Paasche's price index number may be looked upon as weighted average of price relatives.
- (c) Determine the quarterly trend equation from the following trend equation for annual total :  $y_t = 236 + 56t$  (origin: 1981 and unit of t: 1 year).
- (d) Define 'seasonal variation' of a time series.
- (e) Discuss the advantages of chain index over fixed-base index number.
- (f) Find the probability that a specified unit of a population of size N is included in a sample of size n under SRSWR.
- (g) What do you mean by 'ratio of vital events'? Cite an example.
- (h) Define Infant Mortality Rate.
- 2. Answer *any two* of the following :
  - (a) What are the advantages of a random sampling over a complete enumeration?
  - (b) Define 'trend' of a time series. Describe the moving average method for determination of trend.
  - (c) Explain the 'time reversal' and 'factor reversal' tests of index number and examine whether Fisher's ideal index satisfy the above two tests.
- 3. Answer any three of the following :
  - (a) Find an unbiased estimator of population total under simple random sampling schemes. Also derive its standard error.
  - (b) What is a complete life table? Describe the different components of a complete life table. 3+7

#### **Please Turn Over**

2×5

5×2

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(c) What do you mean by 'cost of living index number' and 'consumers price index number'? How would you construct a cost of living index number? 5+5

(2)

- (d) Define 'crude death rate' and 'standardized death rate'. Explain why STDRs are computed, instead of CDRs, to compare the mortality situations of two different communities. 4+6
- (e) Give an example of a time series where an exponential trend model would be appropriate. Describe how an exponential trend can be fitted to a time series data. 2+8