

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 : 2×5
 - (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 : 5×2
 - (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. 4+6
 - (b) What is a complete life table? Describe the different components of a complete life table. 3+7

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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
- (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
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