

1128

B.A./B.Sc. (General) Fifth Semester  
Statistics

Paper-301: Demography and Economic Statistics

Time allowed: 3 Hours

Max. Marks: 65

NOTE: Attempt five questions in all, including Question No. 1 which is compulsory and selecting two questions from each Unit. Simple non-programmable calculator is allowed.

x-x-x

- I. a) Answer the following:-
- Define a vital event and rate of a vital event.
  - What is the benefit of standardizing the death rates?
  - What are the limitations of 'Method of semi-averages to measure the trend'?
  - Write down some applications of Index numbers.
  - What are Giffen's goods? Give example. (5x2)
- b) i) Write down the multiplicative model for time series.  
ii) Write down the benefit of Chain Base index number over fixed base index numbers.  
iii) Define demand function of a commodity. (3x1)

UNIT - I

- II. a) Discuss Gross reproduction rate (G.R.R) and Net reproduction rate (N.R.R) in detail. Give reasons for moving from G.R.R to N.R.R.  
b) For the following data of the male population of Argentina and Colombia in the mid 1980s:

| Age Group | Population (in thousands) | Deaths | Population (in thousands) | Deaths |
|-----------|---------------------------|--------|---------------------------|--------|
| 0-4       | 1767                      | 11832  | 1857                      | 5179   |
| 4-14      | 3062                      | 1390   | 3372                      | 2300   |
| 15-24     | 2430                      | 2816   | 3123                      | 6646   |
| 25-44     | 4101                      | 9690   | 3724                      | 12702  |
| 45-64     | 2755                      | 36581  | 1587                      | 15441  |
| 65+       | 1129                      | 70138  | 478                       | 27034  |

- Calculate the crude death rates for each country.
- Using the population of Argentina as the standard, calculate the directly standardized death rate for Colombia. (8,5)

(2)

- III. Discuss in detail various sources of vital statistics and errors associated with them. (13)
- IV. Define secular trend in Time series. Explain the method of curve fitting by principle of least squares and fit it for a straight line. Discuss its merits and demerits. (13)
- V. What is an Economic time series? Discuss in detail and give examples for:-  
 a) Seasonal fluctuations  
 b) Cyclic variations  
 c) Irregular variations (1,4,4,4)

**UNIT - II**

- VI. Define Index numbers and discuss in detail the problems involved in the construction of Index numbers. (13)
- VII. a) What is Time reversal test and Factor reversal test of Index numbers?  
 b) Compute Laspeyre's, Paasche's, Edgeworth- Marshall and Fisher's Index numbers from the following data:

| Commodities | Base Year |          | Current Year |          |
|-------------|-----------|----------|--------------|----------|
|             | Price     | Quantity | Price        | Quantity |
| A           | 40        | 3        | 60           | 2        |
| B           | 50        | 4        | 60           | 4        |
| C           | 70        | 2        | 90           | 2        |
| D           | 20        | 3        | 10           | 5        |

Show that only Fisher's formulae satisfy the time and factor reversal tests. (5,8)

- VIII. Write short notes on any three of the following:-  
 a) Laws of Demand and supply  
 b) Cost of Living Index Number  
 c) Significance of Elasticity of Demand  
 d) Growth Curves (4,4,5)
- IX. Define lognormal distribution and derive its probability density function. Find its mean, median and mode. Show that lognormal distribution is positively skewed. (13)