(i) Printed Pages : 4 Roll No. .....

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B.A. /B.Sc. (General) 3rd Year

1046

STATISTICS

Paper : 301 : Demography and Economic Statistics

Time Allowed : Three Hours] [Maximum Marks : 65

Note :– Attempt **five** questions in all, including the compulsory **first** question and **two** questions from each section.

(Compulsory Question)

I. (a) (i) Define Specific Death Rates and Infant Mortality Rate.

(ii) What is the Secular Trend of Time Series ?

(iii) Write the p.d.f. of Log normal distribution and Draw its graph.

(iv) Distinguish between weighted average and simple aggregative methods of index numbers. Give suitable examples.

(v) Explain static laws of demand. 2 each

(b) (i) Give two important uses of Time Series.

(ii) Define Price Elasticity of Demand.

(iii) Give expression of Fisher's index numbers. 1 each

SECTION-I

II. The number of births occurring in a country in a particular year is shown here classified according to age of mother, together with the female population in each age-group of the reproductive period :

Age-Group	Female population	Number of births to mother in the age-group
15–19	84,796	2,349
20–24	70,018	14,547
25–29	72,660	16,746
30–34	75,924	10,229
35–39	75,109	5,257
40–44	71,625	1,432
45–49	66,660	93

The total population of the country during the year was 2,285,800. With given data, determine :-

(i) The crude birth rate
(ii) The general fertility rate
(iii) The total fertility rate
(iv) Age specific fertility rate. 13

III. (a) Describe the structure of a complete life table. Explain how the different columns of a life table may be computed on the basis of observed age – specific mortality rates.

(b) Compute the crude and standardized death rate of the two populations A and B regarding A as standard population, from the following data :-

Age-group (years)	A		B	
	Population	Deaths	Population	Deaths
Under 10	20,000	600	12,000	372
10-20	12,000	240	30,000	660
20-40	50,000	1,250	62,000	1,612
40-60	30,000	1,050	15,000	325
Above 60	10,000	500	3,000	180

6,7

IV. (a) Define time-series. Mention its important components and describe a method of smoothing time series.

(b) Fit a straight line trend by the method of least squares and find the trend values :

Year	Milk consumption (Million Gallons)
1940	102.3
1941	101.9
1942	105.8
1943	112.0
1944	114.8
1945	118.7
1946	124.5
1947	102.9

6,7

V. Explain difference between :

(a) Crude death rate and Crude birth rate.

(b) Net reproduction rate and Gross reproduction rate.

(c) General fertility rate and Total fertility rate. 4,4,5

SECTION-II

VI. What is an index number ? Discuss its importance. Explain :-

(a) Time reversal test

(b) Factor reversal test as applied to index number.

Also show that Fisher's ideal index number formula satisfies both these tests. 13

VII. (a) Compute index numbers from the following data using :

(i) Laspeyre's method

(ii) Paasche's method

(iii) Marshall- Edgeworth method

Commodity	Base Year		Current Year	
	Quantity	Price	Quantity	Price
A	12	10	15	12
B	15	7	20	5
C	24	5	20	9
D	5	16	5	14

(b) What is difference between Fixed Based Index Numbers and Chain Base Index Numbers ? 9,4

VIII. What is Cost of Living Index Number ? Explain different methods of Cost of Living Index Number. Also Construct the Cost of Living Index for the year 1982 (Base 1980 = 100) :

Item	Unit	Price (1981)	Price (1983)	Weight
A	Kg.	0.50	0.75	10%
B	Liter	0.60	0.75	25%
C	Dozen	2.00	2.40	20%
D	Kg.	0.80	1.00	40%
E	One Pair	8.00	10.00	5%

13

IX. (a) What is Price Elasticity of Demand for the demand curve

$$p = \frac{a}{b + cy}$$

where p is the price, y is the quantity of demand and a, b, c are constants ?

(b) Define Pareto Distribution and explain its properties. 7,6