

This question paper contains 6 printed pages]

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S. No. of Question Paper : 5808

Unique Paper Code : 2372011202

Name of the Paper : Applied Statistics (DSC-4)

Name of the Course : B.Sc. (Hons.) Statistics

Semester : II

Duration : 3 Hours

Maximum Marks : 90

(Write your Roll No. on the top immediately on receipt of this question paper.)

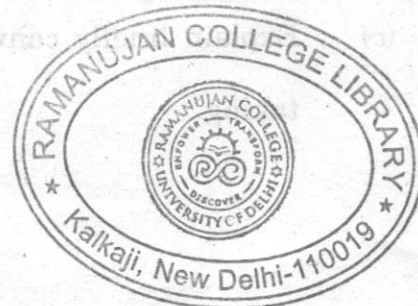
Attempt six questions in all.

Question No. 1 is compulsory.

Use of non-programmable scientific calculator is allowed.

1. (a) Fill in the blanks :

- (i) Chain indices are equal to the corresponding fixed base indices if the formula used satisfies ..... test.
- (ii) ..... index numbers are used for calculation of real wages and for determining changes in purchasing power of money.
- (iii) A life table based on age interval 5 years or more is called ..... life table.



P.T.O.

- (iv) An upward bias is given by ..... index number formula.
- (v) The first population census was taken in .....
- (vi) ..... are given by the aggregate expenditure for any given year expressed as a percentage of same in the base year.
- (vii) ..... provides an upper bound for fertility.
- (viii) Net reproduction rate is ..... Gross reproduction rate.
- (ix) S.D.R.'s completely ignore factors causing differential mortality, so ..... are a better measure of mortality.
- (x) Ministry of Statistics and Programme Implementation came into existence from ..... and is the nodal agency for planned and organised development of statistical system in the country.
- (xi) The Statistical Abstract – India (annual) is an important publication of .....
- (b) In India the crude birth rate and crude death rate in 2022 were 16.27 and 9.074 respectively. Find the crude rate of natural increase.
- (c) Explain briefly canvasser method and householder method of census taking.

11×1,2×2

2. (a) Discuss the criteria required for selection of base period while constructing index numbers. Describe Laspeyre's and Paasche's methods of constructing Price and quantity index numbers.
- (b) Write a short note on CSO highlighting its main functions and major publications. 7,8
3. (a) Explain Time Reversal Test and Factor reversal Test in index numbers. In each case give an example of index number formula which (i) satisfies, and (ii) does not satisfy that test. Justify your statement.
- (b) Define Central Death Rate, Stable population and Stationary population. Show that with usual notations :

$$m_x = \frac{2q_x}{2 - q_x}$$

7,8

4. (a) Differentiate between :
- (i) I.M.R. and A.S.D.R.
- (ii) G.R.R. and N.R.R.
- (b) What is a Consumer Price index number. Describe aggregate expenditure method to construct Consumer Price index number. The adjoining table gives cost of living index numbers for different groups

P.T.O.



with their respective weights for year 1992 (base year 1982). Calculate the overall cost of living index number.

Group	Cost of living index	Weight
Food	525	40
Clothing	325	16
Light and fuel	240	15
Rent	180	20
Others	200	9

Mr. Bose got a salary of Rs. 550 in 1982. How much he should receive as salary in 1992 to maintain his same standard of living as in 1982 ? 7,8

5. (a) Calculate GFR, ASFR and TFR from the given data :

Age group	No. of women (in '000)	No. of live births (in '000)
15-19	55	20
20-24	70	180
25-29	65	200
30-34	64	170
35-39	60	120
40-44	58	60
45-49	50	10

(b) Explain the concept of :

(i) splicing two index number and

(ii) deflating of index numbers mentioning its importance. 7,8

6. (a) What is a chain index ? Show that the chain indices are equal to corresponding fixed base indices if the formula used satisfies the circular test.

(b) Given the following table :

Age ( $x$ )	$l_x$
90	16090
91	11490
92	8012
93	5448
94	3607
95	2320
96	1447

The ages of three men A, B and C are 90, 91 and 92 respectively.

Find the probabilities that :

(i) A, B and C will be alive in two years' time

(ii) one at least of the three will be alive in two years' time

(iii) exactly one of them will be alive in two years' time. 7,8

7. (a) Explain crude and standardised death rates. In what way is the standardised death rate superior to crude death rate ? Give briefly the direct and indirect method of finding standardized death rates.

(b) Write short note on the functioning of the following :

(i) N.S.S.O.

(ii) Director General of Commercial Intelligence and Statistics (DGCIS)

Enlist *two* important publications of each.

7,8

