[This question paper contains 4 printed pages.]

1046 *Your Roll No.* .....

B.Sc. (Hons.) / I **C**

STATISTICS – Paper VI

A–226 : Applied Statistics – I

(For Admissions of 1999 and onwards)

Time : 2 Hours *Maximum Marks : 38*

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

Attempt **Five** *questions in all. Q. No.* **1** *is compulsory. Attempt* **Four** *more questions, selecting at least* **one** *question from each Section.*

1. (a) Interpret the statement :

"The wholesale price index number for India during May 2010 with the year ended March 2000 as the base is 118.9."

(b) Define purchasing power of money. How is it related to price index ?

(c) Show that :

P.T.O.

$$T_{x} = \frac{1}{2} I_{x} + I_{x,1} + I_{x,2} + \ldots,$$

where the notations having their usual meaning.

(d) Why is NRR less than or equal to GRR?

(e) Mention two important publications of NSSO.

(2×5)

SECTION I

2. (a) What is time reversal test? Show that simple geometric mean of price relatives and Marshall Edgeworth index numbers satisfy it.

(b) In calculating an overall Index number, the weights $w_1, w_2, \ldots, w_n$ are attached to the price indices $x_1, x_2, \ldots x_n$. If a_i is the percentage increase in $x_i (i = 1, 2, \ldots, n)$, show that the percentage increase in the overall index number of prices is

$$\frac{\sum w_i x_i a_i}{\sum w_i x_i} \qquad (4,3)$$

3. (a) What is base shifting? Why does it become necessary to shift the base of index numbers? Illustrate with the help of an example.

(b) What is meant by cost of living index number? Describe one method for its construction. (4,3)

4. Write notes on the following :

(a) Chain base and fixed base index numbers.

(b) Development and working of C.S.O. (3½,3½)

SECTION II

5. (a) Define C.D.R. Show that the C.D.R. for a life table for a stationary population, except for the multiplier 1000, equals $\frac{1}{e_0^0}$.

(b) In the usual notations, prove that :

(i) $l_{x+1} + \int_0^1 t\left(-\frac{d}{dt} l_{x+t}\right) dt = \int_0^1 l_{x+t}\, dt$,

(ii) $({}_1|_2p_x + {}_3|_2p_x + {}_5|_2p_x + \ldots) - ({}_1p_x + {}_2p_x + {}_3p_x + \ldots) \simeq \frac{1}{2}$.

(4,3)

6. (a) Define IMR. How is it different from age specific death rate at age '0' ?

(b) Differentiate between GFR and SFR mentioning clearly their relative merits and demerits. (4,3)

P.T.O.

7. (a) Define a life table and describe its various columns stating the interrelationships between them.

(b) Write a note on population statistics in India. (4,3)