2019

B.Sc.

3rd Semester Examination

STATISTICS (Honours)

Paper - C 6-T

Full Marks : 40   Time : 2 Hours

The figures in the margin indicate full marks.
Candidates are required to give their answers
in their own words as far as practiable.

1. Answer any *five* questions : $2\times5=10$

   (a) Why is CDR a probability rate but CBR is not?

                                                2

   (b) Explain the situation of populaion when NRR=1.

                                                2

   (c) Show that CDR of a life table stationary population without the multipliers 1,000 equals $1/e_0^{\circ}$.   2

(d) Obtain the inter-cenrus population estimate by G.P. method.   2

(e) Define crude rate of natural index and vital index as measures of population growth.   2

(f) Show that for life-table stationary population, if the ASDR is m_x then q_x = probability that a person will die between ages x and $x + 1$ is

$$= \frac{2m_x}{2 + m_x}$$
     2

(g) Define force of mortality.   2

(h) Give two uses of life table.   2

2. Answer any *four* questions :   5×4=20

(a) What is content error and coverage error in demographic data ? Explain construction of Mayer's index to evaluate age-heaping in demographic data.   2+3

(b) Give the age distribution of stationary and stable population.   2½+2½

(c) What is infant mortality rate ? Why it is not a probability rate ? Describe a method for adjustment of IMR.   2+2+1

(d) Determine the average age at death of those who die between age x and x + n. 5

(e) Define complete expectation of life $\left(e_x^0\right)$ and curtate expectation of life (e_x).

Show that under suitable conditions

$$e_x^0 = e_x + \frac{1}{2}.$$ 3+2

(f) Find l_x in life-table stationary population when force of mortality μ_x is given by $\mu_x = A \log_e x$ 5

3. Answer any *one* question : 10×1=10

(a) Define CDR and ASDR. Why are these not good measures to compare mortality of two populations ? Explain direct and indirect method to get adjusted death rates.

Can STDR be used to compare mortality situation at two different points of time ? Explain. 2+2+4+2=10

[Turn Over]

(b) Derive the logistic curve for population growth from suitable assumptions.

Describe method due to Rhodes to fit the logistic curve.   5÷5=10