2018

STATISTICS

[Honours]

PAPER – IV

Full Marks : 45

Time : 2 hours

The figures in the right hand margin indicate marks

Candidates are required to give their answers in their own words as far as practicable

Illustrate the answers wherever necessary

[NEW SYLLABUS]

GROUP – A

1. Answer any *one* question : 10 × 1

   (a) (i) Distinguish between 'do while' and 'while' loops with examples. 4

(ii) Write a program in C to calculate the AM and GM of a set of n real numbers. 6

(b) Carry out the following conversions : 6

(i) $(11001 \cdot 11)_2 = (\quad)_{10}$

(ii) $(45AC)_{16} = (\quad)_8$

(iii) $(59.24)_{10} = (\quad)_2$

(iv) Describe RAM and ROM. 4

2. Answer any *two* questions : 5×2

(a) Explain the process to fit an exponential trend to a given set of data using MS-Excel.

(b) What are the different decision control structures used in C ?

(c) Find the sum of the binary numbers :

(i) $101 \cdot 00010$ and 11001101

(ii) 110011 and 100101

GROUP – B

3. Answer any *three* questions :   5 × 3

(a) Show that for a life table the following relation holds approximately :

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

where the symbols have their usual meanings.

(b) Define infant mortality rate (IMR) and discuss its drawback.

(c) Describe the choice of standard population to be used in the measurement of the standardised death rate.

(d) Distinguish between stable population and stationary population.

(e) Derive the equation of the logistic curve under suitable set of assumptions.

4. Answer any *one* question :   10 × 1

(a) (i) Define gross reproduction rate (GRR)

and net reproduction rate (NRR). Show that for any community, NRR $\leq$ GRR. What do you mean by saying that NRR for a community = 1·5 ?   6

(ii) Discuss the major sources of data for vital statistics.   4

(b) (i) Define e^0_x function of a complete life table. Prove that under trapezoidal approximation for area under the curve of l_x,   6

$$e_0^{\ x} = 1 - \frac{1}{2}q_x + \frac{1}{l_x}\sum_{i=1}^{\infty}l_{x+i} - \frac{1}{2l_x}\sum_{i=1}^{\infty}l_{x+i}\ q_{x+i}\ .$$

(ii) Explain the GP method for population projection.   4