2023

(May/June)

STATISTICS

(Elective/Honours)

(Applied Statistics)

STEH–4(TH)

Marks : 56

Time : 3 hours

The figures in the margin indicate full marks for the questions

Answer **five** questions, taking **one** from each Unit

UNIT—I

1. *(a)* Explain crude and standardized death rates. In what way is standardized death rate superior to crude death rate? 4+2=6

(b) Explain the direct and indirect methods of finding standardized death rates. 6

2. *(a)* Explain briefly total fertility rate, gross reproduction rate and net reproduction rate. In what way do they differ from one another as measures of reproduction? 6

(b) Write short notes on the following : 3+3=6

(i) Population projection

(ii) Migration

UNIT—II

3. (a) Explain what is meant by process control and product control. 3

(b) What is a control chart? Explain briefly the construction of a control chart and its uses. 2+4=6

(c) Explain with example the assignable and unassignable causes of variation. 2

4. Write short notes on the following : 5½+5½=11

(a) *p*-chart and *c*-chart

(b) Single-sampling plan and double-sampling plan

UNIT—III

5. (a) Define and discuss the merits and demerits of the following index numbers : 6

(i) Laspeyre's index number

(ii) Paasche's index number

(iii) Fisher's index number

(b) Explain the time reversal test and factor reversal test for an ideal index number. 5

6. (a) Why are index numbers considered as economic barometers? 5

(b) What is cost of living index number? Discuss the following statement :

"The cost of living index number is essentially a consumer's price index." 2+4=6

UNIT—IV

7. (a) Define time series. Explain the additive and multiplicative models of a time series. 2+4=6

(b) What do you understand by seasonal variations in a time series? Explain the link relative method for computing the indices of seasonal variations. 2+3=5

8. (a) Explain the law of demand and supply. The demand functions of two commodities A and B are

$$D_A = 10 - p_A - 2p_B, \; D_B = 6 - p_A - p_B$$

and the corresponding supply functions are

$$S_A = -3 + p_A + p_B, \; S_B = -2 + p_B$$

where p_A and p_B denote the prices of A and B respectively. Find—

(i) the equilibrium prices;

(ii) the equilibrium quantities exchanged in the market. 3+3=6

(b) Explain the price elasticity of demand. If the demand function is $p = 4 - 5x^2$, for what value of x, the elasticity of demand will be unity? [x is the quantity demanded and p is the price]. 5

UNIT—V

9. Discuss the various agencies responsible for the collection of data mentioning their principal publications and their functions. 11

10. Write notes on the following : 5½+5½=11

(a) Agricultural statistics of India

(b) Industrial statistics

★★★