KNT/KW/16/5155

Bachelor of Science (B.Sc.) Semester–IV (C.B.S.) Examination

STATISTICS

(Applied Statistics)

Paper–II

Time : Three Hours] [Maximum Marks : 50

N.B. :— All the **five** questions are compulsory and carry equal marks.

1. (A) State the assumptions in the construction of life tables. Describe the various columns of a life table and their relationships with each other. Explain the construction of life table, if the radix ℓ_o and the column q_x for $x \geq 0$ are given. Also state 3 uses of a life table. 10

OR

(E) Explain the Registration method of collection of demographic data with its relative merits and demerits.

(F) Define infant mortality rate. State its uses and limitations.

(G) Define case fatality rate. State its purpose and limitations.

(H) In usual notations prove that,

(i) $L_x = \frac{1}{2}(\ell_x + \ell_{x+1})$

(ii) $\ell_x = \sum_{i=x}^{w-1} di$, where w is the last age at which $\ell_w = 0$ 2½×4=10

2. (A) Explain the following fertility rates giving definition, formula merits and demerits.

(i) C.B.R.

(ii) G.F.R.

(iii) Age–S.F.R.

(iv) T.F.R. 10

OR

(E) Describe in detail and compare the following measures of population growth :

(i) Crude rate of natural increase

(ii) Pearle's Vital Index

(iii) G.R.R.

(iv) N.R.R. 10

3. (A) Explain the objective of scaling of scores on a test. Explain the construction of σ-scaling or Z-scaling and standard scaling, stating their merits and demerits.

   (B) Describe the procedure for computation of T-scores for a given frequency distribution of raw scores. Explain the uses of T-scores. Compare T-scores and standard scores. 5+5

OR

   (E) Define the difficulty value of a test item. Explain the procedure of scaling individual test items in terms of difficulty.

   (F) Explain the procedure of scaling of ratings in terms of normal curve stating the assumptions. 5+5

4. (A) Describe the concept of reliability of a test. Define parallel tests.

   (B) Compare reliability and validity of a test.

   (C) Define index of reliability and obtain its relation with reliability coefficient.

   (D) What are intelligence tests ? State their use. Define I.Q. Interpret its meaning. 2½×4=10

OR

   (E) Derive an expression for the reliability coefficient of a test which is increased k times and interpret the result.

   (F) Derive an expression for Kuder-Richardson formula-20 for estimating test reliability. State the merits and demerits of this method. 5+5

5. Solve any **10** questions from the following set of questions :

   (A) Define sex ratio at birth.

   (B) Explain why cause-of-death rate is not a probability rate.

   (C) Show that, $T_x = \frac{1}{2}\ell_x + \ell_{x+1} + - - - -$

   (D) What is meant by stable population ?

   (E) Show that, N.R,R. $\leq$ G.R.R.

   (F) Interpret the case NRR = 1.

   (G) State the Linear model of test theory writing the assumptions made.

   (H) Psychological scale is an interval scale. Justify the statement.

   (I) List the various concepts of validity.

   (J) What is a percentile score ?

   (K) 'To be valid a test must be reliable'. Justify the statement.

   (L) State two uses of percentile scores. 1×10=10