NTK/KW/15–5870

Fourth Semester B. Sc. Examination

STATISTICS

Paper – II

Applied Statistics

Time : Three Hours] [Max. Marks : 50

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

1. (A) What is meant by Vital Events and rate of a vital event ? Discuss the following methods of obtaining vital statistics data stating their advantages and disadvantages.

   (i) Census

   (ii) Register

   (iii) Adhoc survey

   (iv) Hospital Records. 10

OR

(E) Describe the various columns of a complete life table stating their inter-relationships.

(F) Show that, in usual notations :—

(i) $m_x = \frac{2q_x}{2 - q_x}$

(ii) $e_x = \sum_{n=1}^{\infty} \frac{l_{x+n}}{l_x}$

and hence prove that $P_x = \frac{e_x}{l + e_{x+1}}$ 5+5

2. (A) Define GRR and interpret it. State its shortcomings.

(B) Explain the concept of stable population. State the conditions under which the stable population becomes stationary.

(C) Explain the construction of T.F.R. Stating its merits.

(D) Define Age – S.F.R. and G.F.R. and interpret them. $2.5 \times 4 = 10$

OR

(E) Define G.R.R. Interpret it stating the assumption underlying in its construction. Explain how G.R.R. is computed when the data on gender wise classification of births are not available. Derive the formula of GRR in this case. State the merits and demerits of G.R.R. Define NRR. Explain how NRR is an improvement over GRR. Show that NRR $\leq$ GRR. 10

3. (A) Explain the procedure of scaling raw scores using the following :—

(i) Standard scaling.

(ii) Percentile scaling.

(iii) Normalized and T-Scaling.

Stating the underlying assumptions. Also state the uses and limitations of the scalings. 10

OR

(E) Explain the procedures for the following stating the objectives and assumptions clearly.

(i) Convertion of ranks 1, 2,....., N into corresponding percentile scores.

(ii) Convertion of ratings A, B, C, D and E into scale values and resultant numerical scores, on the basis of frequency distribution of the ratings. 10

4. (A) Discuss the following three methods of estimating test reliability stating their relative merits and demerits.

(i) Test-Retest Method.

(ii) Split-Half Method.

(iii) Kuder-Richardson Method. 10

OR

(E) Define validity of a test. How is it estimated ? Explain the following concepts of validity.

(i) Predictive validity.

(ii) Concurrent validity.

(iii) Content validity.

(iv) Construct validity. 10

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

(A) Define Infant Mortality rate. State its purpose.

(B) What is the main difference in C.D.R. and Age-S.D.R ?

(C) Define cause-of-death rate.

(D) Explain why C.B.R. is not a probability rate.

(E) Define Pearl's vital index.

(F) Define the crude rate of natural increase. State its purpose.

(G) Define the difficulty value of an item in an Educational test.

(H) Interpret the following cases :—

(i) Mental Ratio > 1

(ii) Mental Ratio < 1

(I) Define mental age of a person.

(J) State one difference in the reliability and validity of a Psychological test.

(K) Define Parallel tests.

(L) Show that the mean and the variance of the raw scores on two paralle tests are equal.

1×10=10