

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) Explain giving formula, the following rates :

- (i) Cause-of-death rate
- (ii) Infant mortality rate
- (iii) Case fatality rate.

Also write their uses and limitations.

10

OR

(E) In usual notations, show that :

$$(i) \quad nq_x = \frac{d_{x+n-1}}{l_x}$$

$$(ii) \quad p_x = \frac{e_x}{1 + e_{x+1}}$$

(F) Explain central mortality rate and force of mortality. Show that $m_x = \mu_{x+\frac{1}{2}}$. 5+5

2. (A) Distinguish between :

- (i) Stable and stationary population
- (ii) C.B.R. and G.F.R.
- (iii) Age S.F.R. and T.F.R.

10

OR

(E) Describe crude rate of natural increase and Pearle's vital index. Also explain G.R.R. and N.R.R. State the relative merits and demerits of each rate. 10

3. (A) Explain the construction of the following scores stating the underlying assumptions :

- (i) Z-score and standard scores
- (ii) Normalized scores and T-scores.

Compare T-scores and standard scores.

10

OR

(E) What are percentile scores ? State the procedure for calculating these scores from a given frequency distribution of raw scores. State the uses of percentile scores.

(F) Explain the following scaling procedures :

- (i) Scaling of rankings in terms of normal curve.
- (ii) Scaling of ratings in terms of normal curve.

5+5

4. (A) Explain the method of rational equivalence stating its merits over other three methods of estimating test reliability. Derive Kuder-Richardson's formula-20 and formula-21. 10

OR

- (E) Define reliability and validity. Compare them. Derive the formula for increased reliability of a test which is increased k times. 10

5. Solve any **TEN** of the following questions :

(A) Distinguish between C.D.R. and Age-S.D.R.

(B) Define sex ratio.

(C) Show that in usual notation :

$$L_x = \ell_x - \frac{1}{2} dx.$$

(D) Show that G.R.R. is the upper limit of N.R.R.

(E) Why C.B.R. is not a probability rate ?

(F) Distinguish between G.F.R. and T.F.R.

(G) Define a difficulty value of a test score.

(H) What is an equivalent score ?

(I) Show that z-scores have a mean zero and variance equal to 1.

(J) Define parallel tests.

(K) Define index of reliability.

(L) State the limits of reliability coefficient.

1×10=10