B.Sc. Part-II (Semester-III) Examination

3S : STATISTICS

Time : Three Hours] [Maximum Marks : 80

Note :— ALL questions are compulsory.

1. (A) Fill in the blanks : 2

(i) Testing of hypothesis is a _____ decision problem.

(ii) In r × s contingency table, d.f. is _____.

(iii) A method of "sample study" relating to population is known as _____.

(iv) The study of birth, death, migration etc. is called _____.

(B) Choose the correct alternative : 2

(i) "Testing of hypothesis" was initiated by :

(a) Karl Pearson (b) R.A. Fisher

(c) J. Neyman (d) C.R. Rao

(ii) Chi-square test is also called as :

(a) Normal test (b) Parametric test

(c) Non-parametric test (d) Two tailed test

(iii) Generally census in every country is conducted after _____ years.

(a) Three (b) Five

(c) Ten (d) Fifteen

(iv) In life table terminology q_x : _____

(a) $\frac{\ell x+1}{\ell x}$ (b) $\ell x + 1 - \ell x$

(c) $\ell x + 1 \cdot \ell x$ (d) $\frac{dx}{\ell x}$

(C) Answer in **ONE** sentence each : 4

(i) What is meant by vital event ?

(ii) Define parameters of population.

(iii) Who proposed the chi-square test for testing the goodness of fit ?

(iv) What is Tx, in life table terminology ?

2. (A) Explain in brief, present statistical system in India. 4

(B) State the important publications of banking and finance. 4

(C) Describe De facto method of census with its advantages and disadvantages. 4

OR

3. (P) What do you mean by official statistics ? 4

(Q) Explain the functions of CSO. 4

(R) Name the publication of agricultural statistics. 4

4. (A) Define vital statistics. Explain registration method of obtaining vital statistics with its demerits. 6

(B) What do you mean by standardization ? Explain indirect method of standardization of death with merits and demerits. 6

OR

5. (P) What are various measures of mortality ? Explain CDR with its merits and demerits. 6

(Q) Explain specific death rates and define age SDR with its merits and demerits. 6

6. (A) What are the assumptions in the construction of life table ? Give the uses of life table. 6

(B) What are different measures of fertility ? Explain age SFR with its merits. 6

OR

7. (P) Prove that, in life table terminology : 6

(i) $nP_x = P_x \cdot P_{x+1} \cdot P_{x+2} \cdot \ldots$

(ii) $e_x = \left(\sum_{n=1}^{\infty} lx + n \right) \Big/ lx$

(Q) Explain N.R.R. in detail. Why N.R.R. is called as rate of replenishment of population ? 6

8. (A) What do you mean by estimation ? Give the requisites of good estimator. 4

(B) Describe unbiased estimator with example. 4

(C) Distinguish between point estimation and interval estimation of a parameter. 4

OR

9. (P) Explain simple and composites hypothesis with example. 4

(Q) Explain Type-I and Type-II error. 4

(R) Explain steps involved in testing of hypothesis. 4

10. (A) Explain the concept of random sample. 4

(B) Obtain sampling distribution of sum of Binomial variate. 4

(C) Describe the steps for drawing a random sample from normal distribution. 4

OR

11. (P) Explain the term statistic and its sampling distribution. 4

(Q) Obtain sampling distribution of sum of Poisson variate. 4

(R) Give the procedure of drawing a random sample from Binomial distribution. 4

12. (A) Define chi-square variate with 'n' degrees of freedom and obtain its m.g.f. 4

(B) State and prove additive property of chi-square variate. 4

(C) Explain Yate's correction factor in 2 × 2 contingency table and give corrected chi-square. 4

OR

13. (P) State the conditions for validity of chi-square test. 4

(Q) Explain chi-square test for testing goodness of fit. 4

(R) In 2 × 2 contingency table

a	b
c	d

show that :

$$\chi^2 = \frac{N(ad - bc)^2}{(a+b)(c+d)(a+c)(b+d)}.$$ 4