

**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  $r \times s$  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  $T_x$ , 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)  ${}_n P_x = P_x \cdot P_{x+1} \cdot P_{x+2} \dots$

(ii)  $e_x = \left( \sum_{n=1}^x l_{x+n} \right) / l_x$

- (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 composite 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  $2 \times 2$  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  $2 \times 2$  contingency table 

a	b
c	d

 show that :

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

