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 :

(i) Set of all possible values of parameter is called _____.

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

(iii) The science of numbers applied to the life history of humans is called _____.

(iv) A method of "sample study" relating to population is known as _____. 2

(B) Choose the correct alternative :

(i) Theory of estimation was founded by _____.

(a) C. R. Rao (b) J. Neyman

(c) R. A. Fisher (d) Karl Pearson

(ii) Square of standard normal variate is a _____.

(a) Normal variate (b) β_1 variate

(c) β_2 variate (d) Chi square variate

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

(a) Acturial statistics (b) Psychological statistics

(c) Educational statistics (d) Demographic study

(iv) In life table terminology, p_x = _____.

(a) $\frac{\lambda_{x+1}}{\lambda_x}$ (b) $l_x - l_{x+1}$

(c) $l_{x+1} - l_x$ (d) $l_x \times l_{x-1}$ 2

(C) Answer in **one** sentence :

(i) Define statistical hypothesis.

(ii) What is standard error ?

(iii) Define most efficient estimator.

(iv) State the various measures of fertility. 4

2. (A) What do you mean by official statistics ? 4

(B) State the publications of labour statistics. 4

(C) Explain De-Jure method of census with its merits and demerits. 4

OR

3. (P) Explain in brief, present statistical system in India. 4

(Q) Explain the functions of CSO. 4

(R) State the important publications of Banking and Finance. 4

4. (A) Define vital statistics. Explain Registration method of obtaining vital statistics with its drawbacks. 6

(B) What are the various measures of mortality ? Explain C.D.R. with its merits and demerits. 6

OR

5. (P) Explain age-SDR in detail along with merits and demerits. 6

(Q) Explain purpose of standardising death rates. Describe direct method of standardization of death rates along with merits and demerits. 6

6. (A) What are the various components of life table ? Also give uses of life table. 6

(B) What are different measures of fertility ? Explain age SFR in detail. 6

OR

7. (P) Describe GRR and give its merits and demerits. 6

(Q) Prove that, in life table terminology :

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

(ii) $T_x = L_x + L_{x+1} + L_{x+2} + \ldots\ldots$ 6

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

(B) Define the following terms with example :

(i) Unbiased estimator (ii) Consistent estimator 4

(C) If $x_1, x_2, \ldots x_n$ is a random sample from a Normal Population $N(\mu, 1)$ then show that :

$t = \frac{1}{n}\sum_{i=1}^{n} x^2$ is and unbiased estimator of $\mu^2 + 1$. 4

OR

9. (P) Describe the steps involved in testing of hypothesis. 4

(Q) Define following terms with example :

(i) Null hypothesis (ii) Alternative hypothesis 4

(R) Explain the term "critical region" in detail. 4

10. (A) Explain the term statistic and its sampling distribution. 4

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

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

OR

11. (P) Explain the concept of random sample. 4

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

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

12. (A) State and prove additive property of Chi-Square variate. 4

(B) Explain Chi-Square test for testing independence of an attributes in r×s contingency table. 4

(C) State the conditions for validity of Chi-Square test. 4

OR

13. (P) Obtain limiting form of Chi-Square distribution with 'n' degree of freedom. 4

(Q) Discuss the Chi-Square test for testing the goodness of fit. 4

(R) Explain Yate's correction factor in 2×2 contingency table and obtain the corrected Chi-Square. 4