AS–1411

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

STATISTICS

Time : Three Hours] [Maximum Marks : 80

Note :— All questions are compulsory.

1. (A) Fill in the blanks :

(i) Population constants are called as _____.

(ii) Standard deviation of sampling distribution of statistic is known as _____.

(iii) CSO was established in the year _____.

(iv) In India population census is conducted at interval of _____ years. 2

(B) Choose the correct alternative :

(i) Chi square variate is square of :

(a) Standard normal variate (b) Binomial variate

(c) Poisson variate (d) Gamma variate

(ii) If $E(t) = \theta$ then t is _____ estimator of θ.

(a) Biased (b) Consistent

(c) Unbiased (d) Sufficient

(iii) In life table terminology ℓ_x = _____.

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

(c) $\ell_{x+1} \cdot \ell_x$ (d) $\ell_x - \ell_{x+1}$

(iv) Crude rate of natural increase = ____.

(a) CBR + CDR (b) CBR – CDR

(c) CBR × CDR (d) $\frac{CBR}{CDR}$ 2

(C) Answer in one sentence :

(i) Define type-II error.

(ii) What is estimator ?

(iii) What is life table ?

(iv) State the various measures of mortality. 4

2. (A) What do you mean by population statistics ? State any four sources of population statistics. 4

(B) Explain census method alongwith merits and demerits. 4

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

OR

3. (P) What do you mean by De facto method of census ? State its advantages and disadvantages. 4

(Q) State the important publications of Agricultural Statistics. 4

(R) Explain in brief working of NSSO. 4

4. (A) What are the various measures of mortality ? Explain age specific death rate along with its merits and demerits. 6

(B) Explain indirect method of standardization of death rates, along with merits and demerits. 6

OR

5. (P) Define vital statistics. Explain the registration method of obtaining vital statistics with its demerits. 6

(Q) Explain crude death rate. State its merits and demerits. 6

6. (A) State the assumptions for construction of life table and give the description of various terms. 6

(B) Explain GRR and state its merits and demerits. 6

OR

7. (P) State the different measures of fertility. Explain TFR along with merits and demerits. 6

(Q) Prove that :

(i) $P_x = \sum_{x=1}^{\infty} \frac{\ell_{x+n}}{\ell_x}$

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

8. (A) Define with example :
   (i) Null hypothesis
   (ii) Alternative hypothesis. 4
   (B) Explain Type-I and Type-II errors. 4
   (C) What do you mean by level of significance and power of a test ? 4

OR

9. (P) Define with example :
   (i) Simple hypothesis
   (ii) Composite hypothesis. 4
   (Q) Explain point estimator and interval estimator of a parameter. 4
   (R) State the procedure of testing of hypothesis problem. 4
10. (A) Define :
   (i) Random Sample
   (ii) Random Sampling. 4
   (B) State the procedure of drawing random samples from Normal distribution. 4
   (C) Obtain the sampling distribution of sum of Poisson variables. 4

OR

11. (P) Explain the concept of sampling distribution of statistic. 4
   (Q) State the procedure for drawing random samples from Poisson distribution. 4
   (R) Obtain the sampling distribution of sum of binomial variables. 4
12. (A) Obtain the moment generating function of Chi-square distribution with n degrees of freedom. 4
   (B) State the conditions for validity of chi-square test. 4
   (C) Explain chi-square test for goodness of fit. 4

OR

13. (P) Obtain the cumulant generating function of chi-square distribution. 4
   (Q) State and prove additive property of chi-square variates. 4
   (R) Explain chi-square test for testing population variance. 4