B.Sc. Part–II Semester–IV Examination
STATISTICS

Time : Three Hours] [Maximum Marks : 80

Note :— ALL questions are compulsory.

1. (A) Fill in the blanks : 2
   (i) F-statistic was discovered by _____.
   (ii) The arrangement of data in accordance of occurrence of time is _____.
   (iii) Price elasticity of demand is always _____.
   (iv) In large sample test _____ statistic is used to test the hypothesis.

   (B) Choose the correct alternative : 2
   (i) The range of F-variate is _____ .
   (a) $-\infty$ to ∞ (b) 0 to ∞
   (c) $-\infty$ to 0 (d) 0 to 1
   (ii) The general tendency of data to increase or decrease over long period of time is _____
   (a) Cyclic variation (b) Seasonal variation
   (c) Random fluctuation (d) Trend
   (iii) The sign test is based on the theory of _____ distribution.
   (a) Normal (b) Geometric
   (c) Binomial (d) Exponential
   (iv) _____ test is used to test equality of population variances.
   (a) F (b) t
   (c) χ^2 (d) z

   (C) Answer in one sentence : 4
   (i) What is cyclic variation ?
   (ii) What is large sample test ?
   (iii) What do you mean by luxuries ?
   (iv) What do you mean by index number ?

2. (A) Obtain the p.d.f. of student's t distribution. 4
   (B) Establish the relationship between t and F distributions. 4
   (C) Explain F-test for testing equality of population variances. 4

OR

3. (P) Obtain p.d.f. of Snedecor's F distribution. 4
   (Q) Establish the relationship between F and χ^2. 4
   (R) Explain t test for single mean. 4

4. (A) Explain the concept of bivariate normal distribution. 4
   (B) State the applications of central limit theorem. 4
   (C) Explain large sample test for difference of proportions. 4

OR

(P) Explain the concept of Fisher's z-transformation. 4

(Q) Discuss large sample test for difference of means. 4

(R) Explain large sample test for single sample proportion. 4

6. (A) Explain the concept of non-parametric tests. State the assumption of Non-parametric methods. 6

(B) Discuss Run test. Obtain the distribution of number of odd and even runs. 6

OR

7. (P) Explain order statistic with the help of example. State the advantages and disadvantages of non-parametric method. 6

(Q) Discuss Kolmogorov Smirnov Two sample test. 6

8. (A) Define :

(i) Marshall Edgeworth price index number 4

(ii) Dorbish-Bowley's price index number.

(B) Show that Fisher's index number lies between Laspeyre's and Paasche's index numbers. 4

(C) Explain cost of living index number state its uses. 4

OR

9. (P) Define :

(i) Paasche's index number

(ii) Fisher's index number. 4

(Q) Show that Fisher's index number satisfies time reversal test. 4

(R) Explain family budget method of obtaining cost of living index number. 4

10. (A) Define Trend and explain moving average method for measurement of trend. 6

(B) What do you mean by de-seasonalization of data ? Discuss simple average method for seasonal variations. 6

OR

11. (P) Define time series. Describe mathematical models in time series. 6

(Q) Explain Ratio to trend method of obtaining seasonal indices. 6

12. (A) Define :

(i) Complementary goods

(ii) Equilibrium price. 4

(B) Discuss Pareto's law of income distribution. 4

(C) Describe the term price elasticity of demand. 4

OR

13. (P) Define :

(i) Necessities and luxuries

(ii) Income elasticity. 4

(Q) Explain law of demand and supply 4

(R) Discuss cross elasticities of demand. 4