AV–1770

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

4S : STATISTICS

Time : Three Hours]　　　　　　　　　　　　　　　　[Maximum Marks : 80

Note :— All questions are compulsory.

1.　(A)　Fill in the blanks :

　　　(i)　Order statistics is sequence of _____.

　　　(ii)　Non-parametric methods are based on _____ assumptions.

　　　(iii)　Arrangement of data in chronological order is called _____.

　　　(iv)　Entire large sample theory is based on _____ test.　　　　2

　　(B)　Choose the correct alternative (MCQ) :

　　　(i)　The test for small sample to test the equality of variance is :

　　　　　(a)　t-test　　　　　　　　　(b)　Large sample test

　　　　　(c)　Paired t-test　　　　　　(d)　F-test

　　　(ii)　Linear trend equation is :

　　　　　(a)　$U_t = a + bt$　　　　　(b)　$U_t = ab^2$

　　　　　(c)　$U_t = a + bt + ct^2$　　(d)　$U_t = a + bc^t$

　　　(iii)　Link relative method is used for :

　　　　　(a)　Trend　　　　　　　　　(b)　Seasonal variation

　　　　　(c)　Cyclic variation　　　　(d)　Random variation

　　　(iv)　If sample drawn from a population is large, then hypothesis about mean (μ) can be tested by :

　　　　　(a)　t-test　　　　　　　　　(b)　F-test

　　　　　(c)　Z-test　　　　　　　　　(d)　None of the above　　　　2

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

　　　(i)　What is quantity relative ?

　　　(ii)　What is index number ?

　　　(iii)　Name the basic assumption for application of exact sample test.

　　　(iv)　Define 'student t' statistic.　　　　4

2.　(A)　Derive p.d.f. of Snedecor's F-distribution.　　　　4

　　(B)　Establish the relation between t and F distribution.　　　　4

　　(C)　Obtain F-test for testing significance of difference between variances.　　　　4

OR

3. (P) Derive student's t distribution with γ degrees of freedom. 4

(Q) What are the applications of F-distribution ? 4

(R) Explain t-test for testing the significance of the difference between the two sample means. 4

4. (A) Describe large sample test for difference of proportions. 4

(B) State and explain central limit theorem. 4

(C) Discuss test of significance for sample correlation coefficient. 4

OR

5. (P) Define Fisher's Z transformation and state only its use. 4

(Q) Describe large sample test for equality of means. 4

(R) What is bivariate normal distribution ? Write down its p.d.f. Also explain the parameters. 4

6. (A) Describe sign test for bivariate distribution. 4

(B) Define non-parametric test. Discuss its advantages. 4

(C) Explain Kolmogorov-Smirnov one sample test. 4

OR

7. (P) What do you mean by order statistics ? Give its example. 4

(Q) Discuss Wilcoxon-Mann-Whitney test. 4

(R) Explain Kolmogorov-Smirnov two sample test. 4

8. (A) Define Time Reversal test and Factor Reversal Test. Show that Fisher's price index number satisfies both the tests. 6

(B) Discuss the problems involved in construction of index number and explain index number as economic barometer. 6

OR

9. (P) What is cost of living index number ? Explain aggregate expenditure method of constructing cost of living index number. 6

(Q) Define :

  (i) Laspeyre's Price Index Number

  (ii) Paasche's Quantity Index Number

  (iii) Dorbish-Bowley Price Index Number. 6

10. (A) What are the merits and demerits of trend fitting by moving average method ? 4

(B) Explain ratio to trend method of measurement of seasonal variations in time series. 4

(C) Write down uses of time series. 4

OR

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11. (P) Define time series and write down its different components. 4

   (Q) Discuss 'method of simple averages' of measurement of seasonal variations. 4

   (R) What is trend ? Explain in detail. 4

12. (A) Explain :

   (i) Price elasticity of demand

   (ii) Price elasticity of supply

   (iii) Income elasticity of demand. 6

   (B) Explain Pareto's law of income elasticity. 6

OR

13. (P) Define demand function of a commodity. What are necessities and luxuries ? Also define price elasticity of demand. 6

   (Q) What are the types of data required for estimating elasticity and explain cross elasticity of demand. 6