

**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  $\infty$
    - (b) 0 to  $\infty$
    - (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)  $\chi^2$
    - (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  $\chi^2$ . 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**

5. (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