

**Faculty of Science**  
**B.Sc (Statistics) III-Year, CBCS-VI Semester**  
**Regular Examinations –June/July, 2022**  
**PAPER-VII: Applied Statistics-II**

Time: 3 Hours

Max Marks: 80

**Section –A**

- I. Answer any *eight* of the following (8X4=32 Marks)
1. Define ANOVA and state Cochran's theorem.
  2. Find the expected sum of squares due to error in two-way classification.
  3. Explain the estimation of parameters in one-way classification.
  4. What are the principles of experimental design? Explain.
  5. Explain missing plot technique in CRD.
  6. Discuss the layout of L.S.D.
  7. Explain registration Method and Census Method.
  8. Explain the measurement of population growth.
  9. What is abridged life-table? Discuss its importance in vital statistics.
  10. Briefly explain Yield Statistics.
  11. Index numbers are barometers. Explain
  12. Explain base shifting, deflecting of an index number.

**Section –B**

- II. Answer the following questions. (4X12=48Marks)
13. (a) Explain in detail the statistical analysis of variance of two-way classification.  
(OR)  
(b) Why we need for ANOVA and explain the assumptions of ANOVA.
  14. (a) Explain Statistical Analysis of CRD.  
(OR)  
(b) Explain efficiency of LSD over RBD when rows are taken as blocks.
  15. (a) Explain in detail different fertility rates.  
(OR)  
(b) Define Life table and explain the various columns of life table.
  16. (a) Explain what are the different methods of measuring National Income.  
(OR)  
(b) Define Index Numbers and explain what the problems are involved in the construction of Index Numbers.

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## Faculty of Science

## B.Sc (Statistics) III-Year, CBCS-VI Semester Backlog Examinations –Jan, 2023

## PAPER: Applied Statistics-II

Time: 3 Hours

Max Marks: 80

## Section-A

I. Answer any *eight* of the following questions (8x4=32 Marks)

1. Write the assumptions of ANOVA
2. State the applications of design of experiments.
3. Define ANOVA and explain about assignable and chance causes of variation.
4. Define Completely Randomised Design (CRD) and state its advantages and disadvantages.
5. Compare the efficiency of LSD over RBD.
6. Explain the layout of RBD with an example.
7. State the uses of Life table.
8. Define Vital Statistics and State the uses of it.
9. Explain the measurement of mortality through Crude Death Rate (C.D.R).
10. Explain about area and yield statistics.
11. Explain factor reversal test in index numbers.
12. Define cost of living index numbers. Give example.

## Section-B

II. Answer the following questions (4x12=48 Marks)

13. (a) Carry out ANOVA one way classification with one observation per cell.

(OR)

- (b) Consider the following data and Carry out analysis of variance of two way classification at 5 % level of significance.

| PLOTS | VARIETIES OF WHEAT |                |                |
|-------|--------------------|----------------|----------------|
|       | A <sub>1</sub>     | A <sub>2</sub> | A <sub>3</sub> |
| 1     | 16                 | 15             | 15             |
| 2     | 17                 | 15             | 14             |
| 3     | 13                 | 13             | 13             |
| 4     | 18                 | 17             | 14             |

14. (a) Carry out the analysis of Latin square design.

(OR)

- (b) Explain in detail about the principles experimental design.

15. (a) State the meaning of various columns of a Life table.

(OR)

- (b) Explain the Gross reproductive rate and Net reproductive rate.

16. (a) What is splicing of index numbers. Explain about forward and backward splicing.

(OR)

- (b) Calculate fixed and chain based index numbers to the following data.

| Year               | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 |
|--------------------|------|------|------|------|------|------|------|------|------|------|
| Price of commodity | 750  | 500  | 650  | 600  | 720  | 700  | 690  | 750  | 840  | 800  |

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## Faculty of Science

**B.Sc (Statistics) III-Year, CBCS –V Semester Regular Examinations –Jan, 2023**

(for data science students only)

**PAPER: Analytical Statistics-I**

Time: 3 Hours

Max Marks: 80

**Section-A**

- I. Answer any *eight* of the following questions (8x4=32 Marks)
1. Explain the limitations of sampling
  2. Define any two types of sampling methods with examples.
  3. Explain the concept of proportional allocation
  4. What are the models in time series Explain?
  5. Explain moving average method for estimating trend.
  6. Discuss link relative method.
  7. Define  $3\sigma$ - control limits
  8. Explain the construction of u- chart
  9. Explain the applications of c-chart
  10. Define ANOVA and write its assumptions
  11. State Cochran's theorem, Give its applications
  12. Give the ANOVA table for CRD.

**Section-B**

- II. Answer the following questions (4x12=48 Marks)
- 13.(a) Define sampling and explain the principle steps in conducting sample survey  
(OR)  
(b) Explain stratified random sampling procedure in detail.
  - 14.(a) Explain how to fit Gompertz curve.  
(OR)  
(b) Define seasonal variations and Explain ratio to trend method in isolating seasonal variations, Also give its merits and demerits
  - 15.(a) Define Quality and Explain the statistical basis for control charts  
(OR)  
(b) Define fraction defective and construct p-chart with a) fixed 'n' b) varying 'n'
  - 16.(a) Three sets of five mice were randomly selected to be placed in a standard maze, but with different color doors. The response is the time required to complete the maze seen below. Perform the appropriate analysis to test if there is an effect due to door color (use  $\alpha=0.01$ )

| Color | Time |    |    |    |    |
|-------|------|----|----|----|----|
| Red   | 6    | 5  | 8  | 14 | 7  |
| Green | 20   | 21 | 23 | 17 | 30 |
| Black | 9    | 11 | 10 | 9  | 15 |

Given  $F_{0.01}(2,12)=6.93$ 

(OR)

- (b) Define RBD and Estimate the missing value in Randomized block design

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## Faculty of Science

## B.Sc (Statistics) III-Year, CBCS –V Semester Backlog Examinations –June, 2023

## Generic Elective

## PAPER: Basic Statistics

Time: 3 Hours

Max Marks: 80

## Section-A

- I. Answer any *eight* of the following questions (8x4=32 Marks)
1. Give the definition of statistics.
  2. Explain about scope of statistics.
  3. Define attributes with examples.
  4. Explain briefly about measures of central tendency.
  5. Define moments.
  6. Define standard deviation
  7. Define Bi-variate data with example.
  8. Define scatter diagram.
  9. Define simple correlation with suitable example.
  10. Define independence of variable.
  11. What is association of attributes?
  12. Define dichotomy classification.

## Section-B

- II. Answer the following questions (4x12=48 Marks)
- 13.(a) Define the following terms with suitable examples.  
(1) Nominal (2) Ordinal (3) Intervalratio  
(OR)  
(b) Explain about tabulation of data.
- 14.(a) Explain about skewness and kurtosis.  
(OR)  
(b) Establish the relationship between central moments in terms of non-central moments.
- 15.(a) Explain about multiple correlation coefficient with formulae.  
(OR)  
(b) Define regression. State the line of regression Y on X equation.
- 16.(a) Explain the following  
(1) Order of a class (2) Ultimate Classes  
(OR)  
(b) Derive an expression for a measure of association between two attributes.

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## Faculty of Science

**B.Sc(Statistics) III-Year, CBCS-VI Semester Regular Examinations –June, 2022**  
**PAPER-VII : Applied Statistics-II**

Time: 3 Hours:

Max Marks: 80

**Section –A**I. Answer any *eight* of the following questions. (8X4=32 Marks)

1. What is analysis of variance? Explain its assumptions.
2. Write the ANOVA table for one-way classification.
3. What are the parameters in two-way classification? Explain
4. Explain the Layout of C.R.D
5. Discuss missing plot technique in RBD.
6. What is an LSD? Give an example.
7. Define Vital Statistics and explain vital events.
8. Explain Reproduction rates.
9. Discuss population projection.
10. Discuss the functions of Central Statistical Organization (CSO).
11. Prove that Fishers Index Number lies in between Laspeyer's and Paasche's Index Numbers.
12. Explain base shifting and splicing of an Index number.

**Section –B**

II. Answer the following questions. (4X12=48 Marks)

13. (a) Explain the ANOVA for Two-way classified data with one observation per cell.  
(OR)  
(b) Explain in detail the expectations of various sum of squares in one – way classification.
14. (a) Explain the principles of experimental design with R.A.Fisher's diagram.  
(OR)  
(b) Explain efficiency of LSD over RBD when columns are taken as blocks
15. (a) Discuss the steps of construct life tables in detail.  
(OR)  
(b) Define Crude Death Rate and Standardized death rates and calculate standardized death rates from the following data.

| Age          | City A     |               | City B     |               | Age distribution of standard population 1000 |
|--------------|------------|---------------|------------|---------------|--|
|              | Population | No. of deaths | Population | No. of deaths |  |
| 0-10         | 1000       | 52            | 3500       | 150           | 300  |
| 10-35        | 7000       | 152           | 4250       | 102           | 500  |
| 35-70        | 4300       | 144           | 1360       | 61            | 150  |
| 70 and above | 1670       | 89            | 720        | 36            | 50   |

16. (a) What is NSSO? Describe its main functions and uses.  
(OR)

(b) Explain in detail the criterion of good Index number.

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## Faculty of Science

**B.Sc (Statistics) III-Year, CBCS –VI Semester Regular Examinations –June,2023**

(for data science students only)

**PAPER: Analytical Statistics-II**

Time: 3 Hours

Max Marks: 80

**Section-A**

- I. Answer any *eight* of the following questions (8x4=32 Marks)
1. Define Multinomial distribution
  2. Explain the principle of Least squares
  3. Write the properties of variance and covariance matrix
  4. Explain about factor analysis
  5. Explain the concept of Multidimensional scaling
  6. Explain the importance of multivariate analysis technique in pattern recognition
  7. Define Vital statistics and explain its uses
  8. Explain the assumptions of life tables
  9. Show that  $NRR \leq GRR$
  10. Explain functions of CSO
  11. Define chain base and fixed base index numbers
  12. Explain the concept of deflation of index numbers

**Section-B**

- II. Answer the following questions (4x12=48 Marks)
- 13.(a) Explain the Multi variate normal distribution and explain its properties  
(OR)  
(b) Define logistic regression and estimate its parameters
- 14.(a) In principal component analysis derive the first principal component  
(OR)  
(b) Define cluster analysis. Explain in detail.
- 15.(a) Explain the various mortality rates in detail.  
(OR)  
(b) Define life table and explain the various terms in life tables
- 16.(a) Explain the various problems involved in construction of index numbers  
(OR)  
(b) Why Fisher's index is called Ideal. Show that it lies between lasphere's and pasches's index numbers

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