DEPARTMENT OF B.SC. MATHEMATICS, STATISTICS & COMPUTER SCIENCE

GE – SYLLABUS

QUANTITATIVE APTITUDE
(GE Inter-Departmental/Inter-Disciplinary)

Credits: 2 **Semester: III**

Subject Code: GE18MS1T **No. of Lecture hours: 30**

Objective: To demonstrate various principles involved in solving Mathematical problems andThereby reducing the time taken for performing job functions.

Outcomes:
CO1: Solve problems related linear equations, ratio and Proportion.
CO2: Analyze the difference between problems on percentages, profit loss and discount
CO3: Analyze the concepts of Simple interest and compound interest.
CO4: Learn the basic concepts of Time and work, Time and distance.

CO5: Create sequences and series in the form of arithmetic and geometric progressions.

UNIT –I **6 Hrs**

Simple equations, Ratio, Proportion, Variation

Simple equations - Definition of Linear Equations - Formation of simple equations Problems on Ages - Ratio and proportion - Definition of Ratio - Properties of Ratios Comparison of Ratios - Problems on Ratios- Compound Ratio - Problems on Proportion

UNIT- II **6 Hrs**

Averages – Percentages

Averages - Percentages– Introduction - Converting a percentage into decimals - Converting a Decimal into a percentage - Percentage equivalent of fractions Problems on percentages.

Profit and loss

Problems on Profit and Loss percentage- Relation between Cost Price and Selling price Discount and Marked Price- Two different articles sold at same Cost Price
Two different articles sold at same Selling Price - Gain% / Loss% on Selling Price.

UNIT- II **6 Hrs**

Simple interest and Compound interest

Simple Interest- Problems on interest and amount -Problems when rate of interest and time period are numerically equal - Compound Interest - Definition and formula for amount in Compound interest- Difference between simple interest and compound interest for 2 years onthe same principle and time period.

Quadratic equations

General form of Quadratic equations -Finding the roots of Quadratic equations Nature of the roots - Relation between the roots

UNIT- IV **6 Hrs**

Time and work: Basic concepts – examples

Time and Distance: Definition – Average speed – distance covered is same, different – stoppage time per hour for a train – time taken with two difference modes of transport problemson Trains- Boats and streams.

UNIT –V **6 Hrs**

Arithmetic progression: nth term of A.P sum to n terms of an A.P
Geometric Progression. nth term of G.P sum to n terms of an G.P and in finite terms of G.P
Problems on Number series - Permutations and Combinations -Probability

ESSENTIAL READING:

1. Dr. Aggarwal RS. 2015. **Quantitative Aptitude.** New Delhi: S. Chand & Company.

SUGGESTED READING:

1. Abhijit Guha, 2005.**Quantitative Aptitude for Competitive Examinations.** 3rd edition. New Delhi: Tata Mc-Graw Hill Co.

QUANTITATIVE APTITUDE
(GE Inter-Departmental/Inter-Disciplinary)

Credits: 1 **Semester: III**

Subject Code: G18MS1P **No. of practical hours: 30**

Objective: To demonstrate various principles involved in solving Mathematical problems andThereby reducing the time taken for performing job functions.

Outcome: Students will be able estimate and check answers to mathematical problems in orderto determine reasonableness, identify alternatives, and select optimal results.

LIST OF PRACTICALS

1-3 Formation of simple equations -Problems on Ages Problems on Ratios - Problems on Proportion.
4. Percentages
5- 8. Commercial Arithmetic- Profit and Loss - Simple interest- Compound Interest - Discount
9. Time and work
10. Time and Distance
11. Arithmetic progression: nth term of A.P sum to n terms of an A.P
12. Geometric Progression. nth term of G.P sum to n terms of an G.P and in finite terms of G.P
13. Problems on Number series.
14. Permutations and Combinations.
15. Probability

DATA ANALYSIS (STATISTICS)
(GE Inter-Departmental/Inter-Disciplinary)

Credits : 2 **Semester: III**

Subject code : G18MS2T **No. of Lecture hours: 30**

Objective: To acquaint students with various statistical methods and their applications in Different fields.

Outcomes:
CO1: **Organize**, manage and present data and Analyze statistical data using measures of centraltendency.
CO2: **Analyze** the statistical data using dispersion and location.
CO3: **Analyze** the concepts of quality control, chance and assignable causes of variation, controlcharts for variables and attributes.
CO4: **Use** the program for optimizing the cost involved in transportation problems.
CO5: Develop and solve transformation models and assignment models.

UNIT I **6 Hrs**

Descriptive Statistics I: Frequency Distribution and graphical presentation of data, measures of central tendency (mean, median, mode, geometric mean and harmonic mean, with simple applications

UNIT II **6 Hrs**

Descriptive Statistics II: Absolute and relative measures of dispersion(range, quartile deviation, mean deviation and standard deviation) with simple applications, Importance of moments, central and non- central moments and their interrelationships (excluding proof), Sheppard's Corrections for moments for grouped data, Measures of skewness based on quartiles and moments of skewness based on quartiles and moments and kurtosis based on moments with real life examples.(Applications only)

UNIT III STATISTICAL QUALITY CONTROL I : **6 Hrs**

Importance of SQC in industry. Statistical basis of Shewart control charts.

Construction of control charts for variables (mean, range, and standard deviation)

Construction of control charts for attributes (p, np, and c-charts with fixed and varying sample sizes)Interpretation of control charts.

UNIT-IV **6 Hrs**

Definition of transportation problem initial basic feasible solution by North West corner rule, Matrix Minima and VAM Methods.

Optimal Solution through Modi table for balanced and unbalanced transportation problem. Degeneracy in Transportation problem.

Transportation problems as a special case of linear Programming problem.

UNIT-V **6 Hrs**

Assignment Problem: Definition of Assignment Problem Assignment problem as a special case of T.P and L.P.P

Optimal solution using Hungarian Method for Balanced and Unbalanced problems Sequencing Problem –Introduction

Optimal sequence of n jobs on two machines and three machines without passing under appropriate conditions.

ESSENTIAL READING:

1. Gupta S.C. and Kapoor V.K.2000. **Fundamental of Mathematical Statistics.** New Delhi:
   S. Chand Company.
2. Gupta S.C. and Kapoor V.K.2000. **Fundamental of Applied Statistics.** Third Edition. New Delhi: S. Chand Company.
3. Sharma S.D. 2007 Operations Research. New Delhi: S. Chand & Co.

DATA ANALYSIS (STATISTICS)
(GE Inter-Departmental/Inter-Disciplinary)

Credits : 1 **Semester: III**

Subject Code : G18MS2P **No. of practical hours: 30**

Objective: To acquaint students with various statistical methods and their applications in Different fields.

Outcome: Students will be able to choose and apply an appropriate statistical analysis or modeling methods to solve problems arising in different research fields using Office automation.

LIST OF PRACTICALS

1. Graphical presentation of data (Histogram, Frequency polygon, ogives) using Office automation.
2. Computation of measures of central tendency, dispersion and coefficients of skewness, kurtosis using Office automation.
3. Fitting of Binomial distribution- Office automation - Direct method using.
4. Fitting of Poisson Distribution- Direct method using Office automation
5. Computation of Correlation coefficient, forming regression lines using Office automation.
6. Small sample tests for mean(s), Paired t-test and Correlation Coefficient using Office automation
7. Small Sample test for single and difference of variances using Office automation.
8. c^2 test for goodness of fit and independence of attribute using Office automation.
9. ANOVA for one way and two-way Classifieds using Office automation.
10. Construction of $\bar{X}$, R and s-charts
11. Construction of p and n p charts with fixed n using Office automation.
12. Construction of p and n p charts with varying n using Office automation.
13. Construction of C and U charts.
14. Construction of O C Curve for Single Sampling plan.