15UCS2A2

ALLIED 2- OPERATIONS RESEARCH

Credit Points:5   **Total Hours: 90**

The objective of this paper is
- ❖ Understanding various mathematical applications in industries.
- ❖ Decision making for real time environment.

UNIT I   **(18 Hours)**

Linear programming: Introduction - Mathematical formulation of the problem - Graphical solution - General form of LPP - **Canonical & standard forms of LPP *** - Simplex method -Big M method - Two phase simplex method.

UNIT II   **(18 Hours)**

Transportation problem: Mathematical formulation of the problem - Initial basic feasible solution (Matrix minimum method , North -west corner rule & VAM) - Moving towards optimality - Unbalanced transportation problems.

Assignment problem: Mathematical formulation of an assignment problem - Hungarian assignment method - Unbalanced Assignment problems.

UNIT III   **(18 Hours)**

Inventory control: Introduction - various costs involved in Inventory - EOQ models with and without shortage - Buffer stock & reorder level- EOQ problems with price -breaks.

UNIT IV   **(18 Hours)**

Replacement problems: Introduction- Replacement of equipments that deteriorates gradually: Value of money does not change with time –Value of money changes with time- to find the optimal Replacement Policy - Replacement of equipment that fails suddenly.

PERT-CPM: Introduction - Rules of network construction – CPM and PERT calculations.

UNIT V   **(18 Hours)**

Queuing theory: Introduction - characteristics of Queuing system- Traffic Intensity - classification of Queues - Problems from single server infinite & finite population model.
(Derivations not Included).

* Self Study
Questions for examinations may be taken from the self study portions also.

Text Books:
1. Kanti Swarup, P.K Gupta & Man Mohan, **"Operations Research",** Sultan chand publications, 9th Edition, 2002, New Delhi.

Reference Books :

1. P.K.Gupta & ManMohan**, "**Problems in Operations Research**"** Sultan Chand Publications, 6th Edition, 1994, New Delhi.

Allied 2 - OPERATIONS RESEARCH

Credit Points: 5   **Total Hours:90**

The objective of this paper is
- ❖ Understanding various mathematical applications in industries.
- ❖ Decision making for real time environment.

UNIT-I   **(18 Hours)**

Linear programming: Introduction - Mathematical formulation of the problem - Graphical solution - General form of LPP, **Canonical & standard forms of LPP*** - Simplex method -Big M method - Two phase simplex method

UNIT-II   **(18 Hours)**

The Transportation problem: Mathematical formulation of the problem - Initial basic feasible solution (Matrix minimum method , North -west corner rule & VAM) - Moving towards optimality - Unbalanced transportation problems.
Assignment problem: Mathematical formulation of an assignment problem - Hungarian assignment method - **Unbalanced Assignment problems***

UNIT-III(Derivations not included)   **(18 Hours)**

Inventory control: Introduction – various costs involved in Inventory – EOQ models without and with shortage – Buffer stock & reorder level -EOQ problems with price –breaks.

UNIT-IV   **(18 Hours)**

Replacement problems: Introduction- Replacement of equipments that deteriorates gradually – Replacement of equipment that fails suddenly.
PERT-CPM: Introduction – Rules of network construction – Critical Path Method calculations– PERT calculations.

UNIT V (Derivations not included)   **(18 Hours)**

Queueing theory: Introduction – characteristics of Queueing system- Traffic Intensity – Poisson process & exponential distribution –classification of Queues – Problems from single server infinite & finite population model.

* Self Study
Questions for examinations may be taken from the self study portions also.

Text Book:
Kanti Swarup, P.K Gupta & Man Mohan, "Operations Research", Sultan chand publications, 9th Edition, 2002,New Delhi.

Reference Books:
1. P.K.Gupta & ManMohan, "Problems in Operations Research" Sultan Chand Publications, 6th Edition, 1994, New Delhi.
2. Hamdy A.Taha, "Operations Research", Pearson Education,7th Edition,2002.

ALLIED 2: COMPUTER ORIENTED NUMERICAL & STATISTICAL METHODS

Credit Points: 5   **Total Hours: 90**

The objective of this paper is
- ❖ To Understand various concepts of numerical methods.
- ❖ To analysis wide variety of statistical data
- ❖ To make an inference and measure the goodness of that inference.

UNIT I   **(18 Hours)**

The Solution of Numerical Algebraic & Transcendental Equations: Bisection method – Newton-Raphson method - The method of false position.
The Solution of Simultaneous Linear Algebraic Equation: Gauss Elimination method –Gauss-Jordon method – Gauss-Seidal method – Gauss-Jacobi method.

UNIT II   **(18 Hours)**

Interpolation: Newton forward interpolation – Newton backward interpolation – Lagrange's method. Numerical solution of ordinary differential equations: Taylor method –Euler method – Runge- Kutta method.

UNIT III   **(18 Hours)**

Numerical Differentiation: Newton's Forward Difference to find derivative - Newton's backward difference to find derivative. Numerical Integration: Trapezoidal rule - Simpson's $1/3^{rd}$ rule –Simpson's 3/8 rule.

UNIT IV   **(18 Hours)**

Measures of central tendency : Mean, Median, Mode, Geometric mean, Harmonic mean. Measures of Dispersion: ***Range** –Quartile deviation- standard deviation-coefficient of variation.

UNIT V   **(18 Hours)**

Correlation: Meaning and definition - Types- Scatter diagram- Karl Pearson coefficient of correlation- Rank correlation. Regression: Meaning and definition- Regression equation of two variables - Difference between correlation and Regression.

* Self Study Topic and Questions for examinations may be taken from Self Study Portions also.

Text Book:
1. P. Kandasamy , K. Thilagavathi, K. Gunavathi "Numerical Methods", S.Chand & company Ltd. New Delhi Revised Edition 2005 (UNIT I, II & III)
2. R. S. N. Pillai, V. Bagavathi, "Statistics"**,** Sultan Chand and Sons & Company Ltd. New Delhi. Reprint 2005. (UNIT IV & V).

Reference Book:
1. V. Rajaraman , "Computer Oriented Numerical Methods" ,PHI Pub,2008.
2. S C Gupta, V. K. Kapoor, "Fundamental Of Mathematical Statistics" **,**Sultan Chand and Sons,2010.

ALLIED 2- MATHEMATICS FOR MANAGEMENT – II

Credit points: 5   **Total Hours:90**
The objective of this paper is
- ❖ Understanding various mathematical applications in industries.
- ❖ Decision making for real time environment.

UNIT I   **(18 Hours)**
Introduction to Operations Research - Mathematical Formulation of a Problem - Graphical solution Method - General Linear Programming problem - Canonical and standard forms of LPP - Simplex Method- Big M method

UNIT II   **(18 Hours)**
The Transportation problem: Mathematical formulation of the problem - Initial basic feasible solution - North West Corner rule - Matrix minima method - Vogel's approximation method- Moving towards optimality - Unbalanced transportation problems.

Assignment problem: Mathematical formulation of assignment problem - Hungarian assignment method - Unbalanced Assignment problems.

UNIT III   **(18 Hours)**
Game theory: Introduction - Two Person zero Sum Game - The Maximin - Minimax Principle - Games without saddle points - mixed Strategies - Solution of 2x2 Rectangular Games - Graphical method - Dominance Property.

UNIT IV   **(18 Hours)**
Replacement problems: Introduction - Replacement of Equipment that deteriorates gradually - Replace of Equipment that fails suddenly.
Queuing Theory: Introducing - Characteristic of Queuing system - symbols and Notations - Problems in $(M/M/1) : (\infty/FIFO)$.

UNIT -V(Derivations not included.)   **(18 Hours)**

PERT-CPM: Introduction - **Rules of network construction*** - critical path method - Programme

Evaluation and Review technique (PERT) calculations.

* Self Study

Questions for examinations may be taken from the self study portions also.

Text Book:

Kanti Swarup, P.K.Gupta & Manmohan, "Operations Research," Sultan & Sons, New

Delhi, 14th Edition, 2008.

Reference Book :
J. K. Sharma, "Operations Research Theory & Applications", Macmillan India Ltd., 4th

Edition, 2010.

15UCC2A2

Allied 2 -BUSINESS STATISTICS

Credit Points: 5   **Total Hours:90**

The objective of this paper is
- ❖ To give basic knowledge about statistical concepts

- ❖ to solve the modern business problems using various statistical techniques

UNIT I   **(18 Hours)**
Meaning and Scope of Statistics - Sources of data* - Collection of data: Primary and Secondary data - Classification and Tabulation - Presentation of data by diagrams - Bar diagram and Pie diagram - Graphic representation - Frequency distribution.

UNIT II   **(18 Hours)**
Method of Central Tendency: Mean, Median, Mode, Geometric mean and harmonic mean - their computation - properties and uses - Measures of dispersion : Range, quartile deviation, standard deviation and co-efficient of variation.

UNIT III   **(18 Hours)**
Skewness: Meaning- Bowley's and Pearson's Co-efficient of Skewness – Correlation - meaning and definition - scatter diagram - Pearson's correlation co-efficient - Rank correlation – Regression :Meaning of regression - regression in two variables.

UNIT IV   **(18 Hours)**
Interpolation: Newton, Lagrange's and binomial methods - Index numbers - meaning – Uses - Methods of construction - Aggregative and relative types - Tests of an index number: Time Reversal test and Factor Reversal test - Cost of living index .

UNIT V   **(18 Hours)**
Time Series – Meaning – Components – Models - Business forecasting - Methods of estimating trend - graphic, semi-average, moving average and least square method - Seasonal Variation : Method of Simple Average .

*Self Study
Questions for Examination may be taken from the Self Study Portion also.

Text Book:
P.A. Navaneetham "Business Mathematics and Statistics" ,Jai Publishers,2007.

Reference Books:
1. S.P. Gupta "Statistical Methods" , Sultan Chand & sons, 21st edition,2003.
2. R.S.N Pillai & V.Bagavathi " Statistics" , S. Chand & Co Ltd, 7th edition.

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Allied – 2 STATISTICS FOR BUSINESS

Credits : 5   **Total Hours : 90**

Objective : On successful completion of this course the students shall enrich to solve the Statistical problems in commerce

UNIT I :   **(18 hours)**
Meaning and Definition of Statistics – Collection of data –– **Primary and Secondary*** - Classification and Tabulation – Diagrammatic and Graphical presentation. Measures of Central tendency – Mean, Median, Mode, Geometric Mean and Harmonic Mean –
simple problems

UNIT II :   **(18 hours)**
Measures of Dispersion – Range, Quartile Deviation, Mean Deviation, Standard Deviation and Co-efficient of Variation. Skewness – Meaning – Measures of Skewness - Pearson's and Bowley's co-efficient of Skewness.

UNIT III :   **(18 hours)**
Correlation –Meaning and Definition –Scatter diagram, Karl Pearson's co-efficient of Correlation, Spearman's Rank Correlation, Co-efficient of Concurrent deviation. Regression Analysis – Meaning of regression and linear prediction – Regression in two variables
– Uses of Regression

UNIT IV :   **(18 hours)**
Time Series – Meaning, Components and Models – Business forecasting – Methods of estimating trend – Graphic, Semi-average, Moving average and Method of Least squares – Seasonal Variation – Method of Simple average. Index Numbers – Meaning, Uses and Methods of construction – Un-weighted and Weighted index numbers – Tests of an Index number – Cost of living index number.

UNIT V :   **(18 hours)**
Interpolation: Binomial, Newton's and Lagrange methods. Probability – Concept and Definition – Addition and Multiplication theorems of Probability (statement only) – simple problems based on Addition and Multiplication theorems only.

* Self Study and questions for examinations may be taken from the self study portions also.
Text Book:
 Navanitham, P.A**, " Business Mathematics & Statistics**" Jai Publishers,Trichy-21

References:
1. Statistical Methods by S.P. Gupta
2. Statistics by R.S.N. Pillai and V. Bagavathi
3. Statistics-Theory, Methods & Application by D.C. Sancheti and V.K. Kapoor
4. Applied General Statistics by Frederick E.Croxton and Dudley J. Cowden

Allied 2 - COMPUTER ORIENTED NUMERICAL AND STATISTICAL METHODS

Credit Points:5   **Total Hours: 90**

The objective of this paper is
- ❖ To Understand various concepts of numerical methods.
- ❖ To apply various statistical methods in Computer Science.

UNIT I   **(18 Hours)**

Numerical Methods: Solution Of Simultaneous Linear Algebraic Equation – Gauss Elimination, Gauss Jordan, Gauss Jacobi, Gauss Seidal and Inverse Of a Matrix By Gauss Elimination Method.

UNIT II   **(18 Hours)**

Interpolation: Newton's forward - Newton's backward- Lagrange's Interpolation method. Numerical Integration: Trapezoidal rule, Simpson's 1/3 and 3/8 rule and Romberg's integration.

UNIT III   **(18 Hours)**

Measures of Central Tendency: Mean, Median, Mode, **Geometric Mean and Harmonic Mean*.** Measures of Dispersion: Range, Quartile Deviation, Standard-deviation, Variance, Coefficient of variation.

UNIT IV   **(18 Hours)**

Skewness: Karl Pearson's and Bowley's coefficient of Skewness. Correlation – Karl Pearson's coefficient of correlation – Rank correlation. Regression: Regression equation of two variables.

UNIT V   **(18 Hours)**

        Concept of sampling – Test of Mean for large samples - t- test: specified mean – difference between two sample means. F test of significance for small sample . Chi-Square test for goodness of fit and Independent test for attributes.

* Self Study Topic

Questions for examinations may be taken from Self Study Portions also.

Text Books:

1.M.K.Venkataraman "Numerical methods for Science and Engineering", the National Publishers & Co, 5th Edition, 2007. (Units I , II)

2.S.P.Gupta "Statistical Methods" , Sulthan Chand & Sons 18th edition 2009.(Units III, IV & V)

Reference Books:

1. P. Kandasamy , K. Thilagavathi, K. Gunavathi "Numerical Methods", S.Chand & company Ltd. New Delhi Revised Edition 2005

2.R.S.N.Pillai **"** Statistics" ,S.Chand & Company, 1st edition 1999.

Allied 4- C PROGRAMMING AND NUMERICAL METHODS

Credit Points:3   **Total Hours: 75**

The objective of this paper is
  ❖ Formulate a problem in a way which allows for computation and decision
  ❖ Solve the problems using C program

UNIT-I   **(15 Hours)**

Introduction-Constants-Variables and Data Types-Operators: arithmetic ,relational, logical, assignment, increment and decrement, conditional, bitwise , special-arithmetic expressions-evaluation of expressions-Mathematical functions. Managing Input and Output operators-Introduction –reading a character writing a character –formatted input-formatted output.

UNIT-II   **(15 Hours)**

Decision making and branching: Introduction-IF,IF ELSE, Nesting of IF ELSE,ELSE IF,The ELSE IF ladder-The Switch statement-?: operator-GOTO statement. Decision making and Looping-Introduction-WHILE,DO,FOR statements-***Jumps in loops**.

UNIT-III   **(15 Hours)**

Arrays: Introduction-One dimensional-Two dimensional- Initializing two dimensional arrays- multidimensional arrays. Structures and Unions: definition and initializing structure variable – array of structure.

UNIT-IV   **(15 Hours)**

Solution of simultaneous linear algebraic equations: Gauss elimination method, Gauss Jordan method, Gauss Jacobi method, Gauss -Seidal method –Computation of inverse of matrix using Gauss elimination method.

UNIT-V   **(15 Hours)**

Interpolation: Newton Forward & Backward interpolation-Newton's Interpolation formula for unequal intervals- Lagrange's method. Numerical Integration: Trapezoidal rule-Simpson's $1/3^{rd}$ rule-Simpson's 3/8 rule.

*Self Study Topic
Questions for Examination may be taken from the Self Study Portion also.

Text Books:
1. E. Balagurusamy, "Programming In Ansi C", 2nd Edition. Tata McGraw-Hill
   Publishing Co. Pvt. Ltd.2008.
2. Dr.M.K.Venkatraman, "Numerical Methods In Science And Engineering" The National
   Publishers Co., 5th edition 2007(For units IV and V).

Reference Books:
1. V.Rajaraman**,** "Computer Programming In C" Prentice Hall of India, New Delhi,2009.

2. P. Kandasamy , K. Thilagavathi, K. Gunavathi, "Numerical Methods" S.Chand & company
   Ltd. New Delhi Revised Edition 2005.

Allied Practical - C PROGRAMMING-Lab

Credit Points:2   **Total Hours: 30**

WRITE A C PROGRAM FOR THE FOLLOWING:

1. To find the mean.

2. To find the median.

3. To find the correlation.

4. To find the regression.

5. To find the standard deviation.

6. To find sum and difference of a given matrices.

7. To find Multiplications of Matrices.

8. To find the trace of a matrix.

9. To convert temperature in Fahrenheit to Celsius and vice versa.

10. To convert days to months and days.

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Allied 4- BUSINESS STATISTICS

Credit points: 5   **Total Hours:90**

The objective of this paper is
- ❖ To give basic knowledge about statistical concepts

- ❖ to solve the modern business problems using various statistical techniques

UNIT I   **(18 Hours)**
*Meaning and scope of statistics – Sources of data – Collection of data : primary data and secondary data – Classification and Tabulation – Presentation of data by diagrams – Bar diagram and Pie diagram – Graphic representation – Frequency distribution.

UNIT II   **(18 Hours)**
Measures of Central tendency: Mean, Median, Mode, Geometric mean and Harmonic mean – their computation – properties and uses – Measures of dispersion : Range, quartile deviation, standard deviation and Co-efficient of variation.

UNIT III   **(18 Hours)**
Skewness : Meaning – Bowley's and Pearson's co-efficient of skewness – Correlation : Meaning and definition – Scatter diagram – Pearson's correlation co-efficient – Computation and interpretation - Rank correlation – Regression: Meaning of regression and linear prediction – Regression in two variables.

UNIT IV   **(18 Hours)**
Interpolation : Newton, Lagrange and binomial methods – Index numbers : meaning – Uses – Methods of construction – Aggregative and relative types – Tests of an index number : Time Reversal Test and Factor Reversal test– Cost of living index .

UNIT V   **(18 Hours)**
Time series : Meaning – Components – Models – Business forecasting – Methods of estimating trend – graphic, semi average, moving average and least square method – Seasonal Variation : Method of Simple Average.

*Self Study
Questions for Examination may be taken from the Self Study Portion also.

Text books:
1. Business Mathematics& Statistics - Navaneetham P A - Jai Publishers,2007.
Reference Books:
1.Statistics - Pillai R S N & Bhagavathi - S. Chand & Co , 7th edition, 2008.
2.Statistical Methods - Gupta S P - Sultan Chand & Sons , 21st edition, 2003.