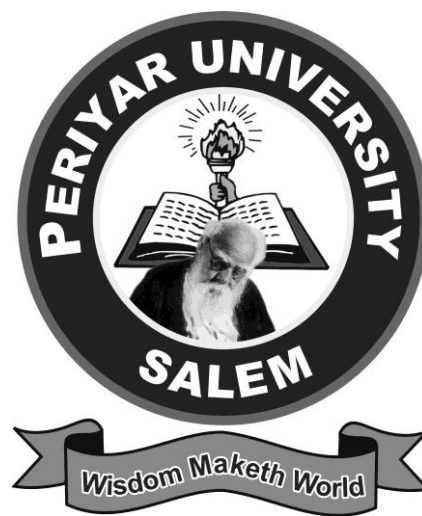**Annexure - 4**

PERIYAR UNIVERSITY

SALEM – 636011

PERIYAR INSTITUTE OF DISTANCE EDUCATION

(PRIDE)

B.Sc. MATHEMATICS

(NON-SEMESTER PATTERN)

Regulations and Syllabus

Effective from the academic year 2008-2009

1. OBJECTIVES OF THE COURSE

Mathematics is the key to success in the field of science and engineering. Today, the students need a thorough knowledge of fundamental basic principles, methods, results and a clear perception of the power of mathematical ideas and tools to use them effectively in modeling, interpreting and solving the real world problems. Mathematics plays an important role in the context of globalization of Indian economy, modern technology, computer science and information technology. This syllabus is aimed at preparing the students to cope with the latest developments and compete with students from other universities and put them on the right track.

2. ELIGIBILITY FOR ADMISSION

A pass in the Higher Secondary Examination of Tamil Nadu Higher Secondary Board or some other Board accepted as equivalent thereto by the Syndicate of the Periyar University.

3. DURATION OF THE COURSE

The course of study shall be based on Non-Semester pattern. The course shall consist of a total period of three years. The course of study shall comprise of the following subjects according to the syllabus and books prescribed form time to time.

I-YEAR

Foundation Courses   1. Language-I
                     2. English-I

Core Courses

Main Subject   3. Algebra , Trigonometry and Differential Calculus
               4. Integral Calculus, Differential Equations and Laplace Transforms.

Allied subject   5. Allied I   Mathematical Statistics

II- YEAR

Foundation Courses   6.Language-II
                     7. English-II

Core Courses

Main Subject   8. Vector Calculus, Fourier Transforms and Financial Mathematics.
               9. Mechanics.

Allied subject   10. Allied II   Financial Accounting

III- YEAR

    Core Courses   11.Algebraic Structures

                     12.Real and Complex Analysis

    Main Subject   13. Operations Research

                     14. Programming in C with applications to

                         Numerical Analysis without practicals

                     15. Application Oriented Subject.

                       Any one of the following three subjects

                          i) Probability Theory

                         ii) Graph Theory

                         iii) Discrete Mathematics

4. EXAMINATIONS:

The theory examination shall be of three hours duration for each paper at the end of each year. The candidate failing in any subject(s) will be permitted to appear for each failed subject(s) in the subsequent examinations.

4.1 SCHEME OF EXAMINATIONS

The scheme of Examinations for different years shall be as follows:

S1.No.	Title of the Paper	Duration	Marks
	I- YEAR		
1.	Language-I	3	100
2.	English-I	3	100
3.	Algebra , Trigonometry and Differential Calculus	3	100
4.	Integral Calculus, Differential Equations and Laplace Transforms	3	100
5.	Allied I- Mathematical Statistics	3	100
	II- YEAR		
6.	Language-II	3	100
7.	English-II	3	100
8.	Vector Calculus ,Fourier Transforms and		

Financial Mathematics 3 100

9. Mechanics. 3 100

10. Allied II Financial Accounting 3 100

III - YEAR

11. Algebraic Structures 3 100

12. Real and Complex Analysis 3 100

13. Operations Research 3 100

14. Programming in C with applications to
     Numerical Analysis without practicals 3 100

15. Application Oriented Subject. 3 100

Total Marks 1500

4.2 SUBJECT CODE FOR EACH PAPER

Title of the Paper	Code
Algebra , Trigonometry and Differential Calculus	**P07UMA01**
Integral Calculus, Differential Equations and Laplace Transforms	**P07UMA02**
Vector Calculus , Fourier Transforms and Financial Mathematics	**P07UMA03**
Mechanics	**P07UMA04**
Algebraic Structures	**P07UMA05**
Real and Complex Analysis	**P07UMA06**
Operations Research	**P07UMA07**
Programming in C with applications to Numerical Analysis without practicals	**P07UMA08**

Application Oriented Subjects

1. Probability Theory **P07UMAZ01**

2. Graph Theory **P07UMAZ02**

3. Discrete Mathematics **P07UMAZ03**

ALLIED SUBJECTS

Subject	Code
Mathematical Statistics	**P07USTA01**
Financial Accounting	**P07UCMA01**

4.2 UNIFORMITY IN THE NUMBER OF UNITS IN EACH PAPER

Each theory paper shall consist of five units. The Question paper shall consist of questions uniformly distributed among all the units.

For theory papers without practicals, Maximum marks is 100.

For theory papers with practicals,

Theory : Maximum marks 75

Practical : Maximum marks 25

Total : Maximum marks 100

4.3 QUESTION PAPER PATTERN FOR ALL UG COURSES

QUESTION PAPER PATTERN WITH OUT PRACTICAL

Time:3 Hours   Max. Marks-100

Part A: 10x2=20

(Answer all questions)

(Two questions from each unit)

PartB: 5x4=20

(Answer all questions)

(one question from each unit with internal choice)

Part C: 5x12=60

(Answer all questions)

(One question from each unit with internal choice)

QUESTION PAPER PATTERN WITH PRACTICAL

Time: 3 Hours   Max. Marks-75

Part A: 10x2=20

(Answer all questions)

(Two questions from each unit)

Part B: 5x4=20

(Answer all questions)

(One question from each unit with internal choice)

Part C: 5x7=35

(Answer all questions)

(One question from each unit with internal choice)

4.4 PASSING MINIMUM

The candidate shall be declared to have passed the examination if the candidate secures not less than 40 marks in the University examination in each theory paper without practical and 30 marks in the theory paper with practical. For the Practical Paper, a minimum of 40 marks out of 100 marks in the university examination and the record notebook taken together is required to pass the examination. In the case of practical paper with 25 as maximum marks a minimum of 10 marks in the university practical examination and the record notebook taken together is required to pass the examination. There is no passing minimum for the record notebook . However submission of a record notebook is compulsory.

4.5 CLASSIFICATION OF SUCCESSFUL CANDIDATES

Candidates who secure not less than 60% of the aggregate marks in the whole examination shall be declared to have passed the examination in First Class. All other successful candidates shall be declared to have passed in the second Class. Candidates who obtain 75% of the marks in the aggregate shall be deemed to have passed the examination in First Class with Distinction provided they pass all the examinations prescribed for the course at the first appearance. Candidates who pass all the examinations prescribed for the course in the first attempt and within a period of three academic years from the year of admission to the course only are eligible for University Ranking.

7. COMMENCEMENT OF THIS   REGULATION

      These regulations shall take effect from the academic year 2007-2008 ie, for the students who are admitted to the first year of the course during the academic year 2007-08 and thereafter.

8.TRANSITARY PROVISION

      Candidates who were admitted to the UG course of study prior to 2007-08 shall be permitted to appear for the examinations under those regulations for a period of three years ie, up to and inclusive of the examination of April/May 2012. Thereafter they shall be permitted to appear for the examination only under the regulations then in force.

<div align="center">

FIRST YEAR

</div>

PAPER I   ALGEBRA , TRIGONOMETRY AND DIFFERENTIAL CALCULUS

PAPER CODE P07UMA01

UNIT I

      Cayley-Hamilton theorem-statement only- Characteristic equation- Characteristic roots and Characteristic vectors- properties-problems

      Polynomial equations- theorems-every n^{th} degree equation has got exactly n roots- An equation with rational coefficients has irrational roots in conjugate pairs- an equation with real coefficients has imaginary roots in conjugate pairs-(statement only)- problems-

Relation between roots and coefficients

UNIT   II

      Transformation of equations-roots with sign changed-roots multiplied by a given number- squares of the roots-increasing or decreasing the roots of a given equation by a given number-removing the second term of a given equation-transformations in general-problems.

UNIT III

  Expansions of $\sin n\theta$, $\cos n\theta$, $\tan n\theta$ -Expansions of $\sin^n \theta$, $\cos^n \theta$ - Expansions of $\sin\theta$, $\cos\theta$, $\tan\theta$ in terms of θ - problems-Hyperbolic and inverse hyperbolic functions-properties- problems- Logarithm of a complex number

UNIT IV

  Derivatives-Definition of a derivative, differentiation techniques – Standard formulae -differentiation of Implicit functions-successive Differentiation-The nth derivative - Standard results- Leibnitz formula for the nth derivative and applications - Meaning of the derivative – Simple problems for all the above sections.

UNIT V

  Partial Derivatives- Definition-Successive partial derivatives- Function of a function rule-Total differential co-efficient- Implicit functions- Homogeneous functions and Euler's Theorem-problems- Curvature, radius of curvature in Cartesian and polar co-ordinates only- simple problems.

Reference Books :

1. T.K.Manickavasagam pillai and S.Narayanan : ALGEBRA (Vol I)
Year of Publication 2004.
Vijay Nicole Imprints Pvt Ltd, # C-7, Nelson Chambers,
115, Nelson Manickam Road, Chennai- 600029

2. P.R.Vittal.: ALGEBRA , ANALYTICAL GEOMETRY AND
TRIGNOMETRY- Year of Publication 2000
Margham Publications,24, Rameswaram Road, T.Nagar, Chennai-600017.

3. T.K.Manickavasagam pillai and S.Narayanan : TRIGONOMETRY
Year of Publication 2004.
Vijay Nicole Imprints Pvt Ltd, # C-7, Nelson Chambers,
115, Nelson Manickam Road, Chennai- 600029

4. N.P.Bali- TRIGONOMETRY- Year of Publication 1994.
Krishna Prakasan Mandhir, 9, Shivaji Road, Meerut (UP)

5. T.K.Manickavasagam pillai and S.Narayanan.: CALCULUS (VOL I)
Year of Publication 2004.

Vijay Nicole Imprints Pvt   Ltd, # C-7, Nelson Chambers,
115, Nelson Manickam Road, Chennai- 600029

6.   P.R.Vittal.: CALCULUS   - Year of Publication 2000
        Margham Publications,24, Rameswaram Road, T.Nagar, Chennai-600017.

I YEAR

PAPER II   INTEGRAL CALCULUS, DIFFERENTIAL EQUATIONS AND LAPLACE TRANSFORMS

PAPER CODE P07UMA02

UNIT I

Definition of integration – List of standard formulae – Different types of integration – Integration by substitution – Integration of rational functions – Integration of irrational functions – Integration by partial fractions – Integrals of the type-

$$\int \frac{a\sin x + b\cos x}{c\sin x + d\cos x}dx \quad \int \frac{dx}{a^2\cos^2 x + b^2\sin^2 x} \quad \text{and} \quad \int \frac{dx}{(ax+b)\sqrt{lx^2+mx+n}} - \text{Integration by}$$

parts – simple problems for all the above sections

UNIT II

Definition – Properties of definite integral with problems – Reduction

formulae – Bernoulli's Formula – Reduction formula for $\int_0^{\frac{\pi}{2}} \sin^n x dx$,

$$\int_0^{\frac{\pi}{2}} co s^n x dx, \int_0^{\frac{\pi}{4}} \tan^n x dx, \int \sec^n x dx,$$

$\int \cot^n x dx$, and $\int x^n e^{ax} dx$ simple problems for all the above sections

UNIT III

Differential Equations-Equations of first order and higher degree – Equations solvable for p- solvable for x-solvable for y – Clairaut's form – Exact differential equations and method of obtaining solution to an exact differential equation –problems.

Second order differential equations with constant coefficients – Particular integrals of e^{ax} V where is of the form x, x^2 , sin ax and cos ax – problems - Second order differential equations with variable coefficients.

UNIT IV

Formation of Partial differential Equations by eliminating arbitrary constants and arbitrary functions- Non-linear differential equations of first order-definition – Complete, Particular, singular and general integrals – Solutions of the Partial Differential Equations of standard types – Clairaut's form, equations reducible to the Clairaut's form – simple problems. Lagrange's Linear Partial differential equations Pp+Qq=R – simple problems only –

UNIT V

Laplace transforms-definition-standard formulae-elementary theorems with proof-problems - Inverse Laplace transforms- standard formulae-elementary theorems-problems – applications to solving second order differential equations with constant coefficients.

Reference Books :

1. T.K.Manikkavasagam & Others : CALCULUS (Vol II)
   Year of Publication 2004.
   Vijay Nicole Imprints Pvt Ltd, # C-7, Nelson Chambers,
   115, Nelson Manickam Road, Chennai- 600029
2. P.R.Vittal.: CALCULUS   - Year of Publication 2000
   Margham Publications,24, Rameswaram Road, T.Nagar, Chennai-600017
3. N.P.Bali : CALCULUS: Year of Publication 1994.
   Krishna Prakasan Mandhir, 9, Shivaji Road, Meerut (UP)
4. Dr.P.R.Vittal - DIFFERENTIAL EQUATIONS AND LAPLACE TRANSFORMS
   Year of Publication 2002
   Margham Publications,24, Rameswaram Road, T.Nagar, Chennai-600017
5. S.Narayanan and others – CACLULUS (Vol III) Year of Publication 2004.
   Vijay Nicole Imprints Pvt Ltd, # C-7, Nelson Chambers,
   115, Nelson Manickam Road, Chennai- 600029
6. S.Sankarappan and S.Kalavathi – DIFFERENTIAL EQUATIONS AND LAPLACE TRANSFORMATIONS - Year of Publication 2004.
   Vijay Nicole Imprints Pvt Ltd, # C-7, Nelson Chambers,
   115, Nelson Manickam Road, Chennai- 600029

II YEAR

PAPER III   **VECTOR CALCULUS , FOURIER SERIES AND**
FINANCIAL MATHEMATICS

PAPER CODE P07UMA04

UNIT I

Definition of Gradient of a Scalar point function – Directional derivative of a vector point function –Unit normal vector- Divergence and Curl of a vector point function- Definitions - solenoidal and irrotational Vectors –problems.

UNIT II

Fourier series-definition-to find the Fourier coefficients of periodic functions of period 2π- even and odd functions- half range series-problems.

UNIT III

Introduction-Fourier integral representation-Fourier integral theorems- statement only - sine and cosine integral representations-transformation of elementary functions-properties of Fourier transforms-linearity property- change of scale-shifting property-simple   problems.

UNIT IV

Probability - Probabilities and Events – Conditional probability – Random Variables   and Expected values – Convergence and Correlation – Continuous Random Variables –   Normal Random Variables – Properties of Normal Random Variables – The Central Limit   Theorem – Simple problems- Geometric Brownian Motion – G.B.M. as a limit of simple   models – Brownian Motion - Simple problems - Interest rates – present value analysis – Rate   of return – continuation of varying interest rates – An example of option pricing – other   examples of pricing via arbitrage.

UNIT V

The Arbitrage theorem – The multiperiod Binomial model – proof of the Arbitrage Theorem – Black Scholes formula – properties of the Black – Scholes option

cost - Derivation of Black Scholes formula –simple problems-Additional results on options – Call options on Dividend paying Securities – Pricing American put options – Adding Jumps to Geometric Brownian Motion – Estimating the Volatility Parameter - Simple problems

Text Books

For Unit I

1.   P.R.Vittal and V Malini :VECTOR CALCULUS- Year of Publication 1997

Margham Publications,24, Rameswaram Road, T.Nagar, Chennai-600017

For Units II and III

2.   P.R.Vittal : CALCULUS - Year of Publication 2000

Margham Publications,24, Rameswaram Road, T.Nagar, Chennai-600017

For Units II and III

3.   Sheldon   M.   Ross   -   AN   ELEMENTARY   INTRODUCTION   TO MATHEMATICAL

FINANCE 2nd Edition - Cambridge University Press – 2005

Reference Books

1.   P.Duraipandian: VECTOR CALCULUS – Year of Publication 1984.

S.Viswanathan & CO, 38, Mcnicals Road, Chetput, Chennai-600031

2.   K.Viswanathan &S.Selvaraj :VECTOR CALCULUS -Year of Publication 1984.

Emerald Publishers,135,Anna Salai, Chennai - 600002

3.   T.K.Manickavasagam pillai and S.Narayanan: CALCULUS (Vol III) -

Year of Publication 2004.

Vijay Nicole Imprints Pvt Ltd, # C-7, Nelson Chambers,

115, Nelson Manickam Road, Chennai- 600029

II YEAR

PAPER IV   MECHANICS

PAPER CODE P07UMA04

UNIT I

Introduction –Force-definition-Parallelogram Law of forces, Triangular Law of forces and converse of Triangular Law of forces. – Lami's theorem – problems – Like and unlike parallel forces – Problems – Moments - definition – Varignon's theorem – problems.   Couples - Definition of a Couple – moment of a Couple – Theorems – Problems – three forces acting on a rigid body – Coplanar forces – General conditions of equilibrium of coplanar forces acting on a rigid body – problems.

UNIT II

Introduction – Friction – definition- coefficient of friction – Limiting friction – Angle of friction and Cone of friction - Laws of friction – Equilibrium of a particle on a rough inclined plane under any force – problems

Common catenary - definition- sag and span- Intrinsic, Parametric and Cartesian equations of a catenary – properties – Suspension bridge – approximation to the shape of a catenary – problems

UNIT III

Introduction – Velocity – definition- resultant velocity – parallelogram law- acceleration- Motion of a particle along a straight line under uniform acceleration – problems – Simple Harmonic Motion – Definition - Equations of S.H.M.- Properties of S.H.M- problems – Impulse and impulsive force – definitions only – Principle of Conservation of linear momentum- Newton's experimental law – Change in K.E is equal to Work Done – Direct and oblique impact of two smooth spheres – Problems – Impact of a smooth sphere on a fixed plane – problems.

UNIT IV

Introduction –Projectile, Trajectory, horizontal range, velocity of projection and angle of projection – definitions – The path of a projectile is a parabola – Range and time

of flight on a horizontal plane- Problems- Range and time of flight on an inclined plane – problems.

UNIT V

Standard results of Moments of Inertia of standard bodies – Parallel axes theorem and perpendicular axes theorem – Statement only – motion of a rigid body about a fixed horizontal axis –K.E.- Moment of Momentum – Equation of Motion

Text Book

1.   P.Duraipandian : MECHANICS

Year of Publication 1984.

Emerald Publishers,135,Anna Salai, Chennai - 600002

Reference Books

1.   S.Narayanan – STATICS :

Year of Publication 1986.

S.Chand & Co.Chennai.-

2.   Dr.M.K.Venkataraman - STATICS

Year of Publication 1994.

Agasthiar Publications,9A, Clives Building,

33, Nandhi Koil Street, Theppakulam (Post), Trichy-620002

3.   Dr.M.K.Venkataraman - DYNAMICS

Year of Publication 1994.

Agasthiar Publications,9A, Clives Building,

33, Nandhi Koil Street, Theppakulam (Post), Trichy-620002.

III YEAR

PAPER V   ALGEBRAIC STRUCTURES

PAPER CODE P07UMA05

UNIT I

Subgroups – Definition – Examples – Properties - Problems – Cosets - Lagrange's Theorem –   Corollary - Normal Subgroups - Quotient groups -Definition - Properties.- Examples – Problems.

Homomorphism -. Definition – Examples - properties - Kernel of a Homomorphism - properties. Isomorphism. – Definition - properties - Fundamental theorem on Homomorphism .

UNIT II

Rings - Definition –Examples - Ring of real Quaternion - Properties – Special Classes of Rings – Zero divisor – Integral domain – definition – Properties – Unit – Division ring – Field – Definition – Examples – Properties – Ring of Gaussian Integers – Boolean Ring – Sub rings and Sub-field - Definition – Examples – Properties - Ideals - Definition – Examples – Properties –Quotient rings - Principal Ideal – Maximal Ideal, Prime Ideal - Definition – Properties- The characteristic of an integral domain- Definition – Properties

UNIT III

Vector Space – definition and simple properties -example- subspaces - Quotient spaces definition -Sums & direct sums -definition -Linear dependence and Linear independence of vectors-Definition-problems- linear span L(S) -Basis and Dimension – definition –properties – theorems – Homomorphism –definition –Isomorphism - theorems –kernel of a homomorphism-simple theorems .

UNIT IV

Definition- properties-examples- norm of a vector- Schwarz inequality – triangle inequality-parallelogram law- orthogonal vectors- definition- orthogonal complement – properties –orthonormal set- definition –properties-simple theorems – problems

UNIT V

The algebra of Linear transformations – definition.-theorems–minimal polynomial –Invertible and Singular transformations-examples-Rank of a linear transformation -theorems –problems- Eigen values and Eigen vectors.- definition – theorems-problems .

Text Book

1.   M.L.Santiago - MODERN ALGEBRA- Year of Publication 1994.
        Tata Mc Graw-Hill,New Delhi.

Reference books

1.   Dr. R. Bala Krishnan and Dr. N. Ramabadran - A TEXT BOOK OF MODERN
     ALGEBRA – Year of Publication 1994. Vikas Publishing House, NewDelhi..
2.   A.R.Vasistha.-A FIRST COURSE IN MODERN ALGEBRA –
     Year of Publication 1983.
     Krishna Prakasan Mandhir, 9, Shivaji Road, Meerut (UP)
3.   I.N. Herstein - TOPICS IN ALGEBRA –2nd edition, Year of Publication 1975.
     John Wiley,New york ,
4.   K.Viswanatha Naik - MODERN ALGEBRA - Year of Publication 1988.
     Emerald Publishers,135,Anna Salai, Chennai - 600002

III YEAR

PAPER VI   **REAL AND COMPLEX ANALYSIS**

PAPER CODE P07UMA06

UNIT I

Field of Real numbers – Axioms – Bounded sets – lub & glb- Completeness axioms – Archimedean property – Definition of Rational numbers – Monotone sequences – Theorem on nested intervals – Dedikind's cut property – square roots – absolute value.

Bounded sequences – Null Sequence – Convergent sequence – Subsequences – Bolzano- Weirestrass Theorem – Cauchy's Criterion for convergence – Limit superior and limit inferior of a bounded sequence.

UNIT II

Intervals - Closed sets – open sets – Neighborhoods – finite and infinite sets-Heine-Borel covering theorem – Limit of a function at a point – Deleted neighborhoods – Limits and continuity – Characterization of limits – Algebra of limits.

Continuity of a function at a point – Algebra of continuity –examples– one sided continuity – composition - continuous function on an interval - Intermediate value theorem – Continuous function on a closed interval – Monotonic Continuous Functions – Inverse function theorems – Uniform continuity.

UNIT III

Functions of a complex variable- limit of a function at a point - theorems on limits –continuity –derivatives – Cauchy–Riemann equations – necessary and sufficient conditions –analytic function-examples- harmonic function- properties –to find an analytic function whose real or imaginary part is given.

UNIT IV

Simply-connected domain- Cauchy's fundamental theorem – proof using Goursat's lemma - Cauchy's theorem for multiply connected domains- Cauchy's integral formula & Cauchy's formula for the first derivative –Morera's theorem .

Cauchy's inequality- Liouville's theorem- Fundamental theorem of Algebra- Maximum modulus theorem –Taylor's series –Laurent's series –problems.

UNIT V

Singularities – types of singularities- isolated singularly –removable singularity – pole –essential singularity- determination of the nature of singularity –residue- definition – calculation of residues- Cauchy's Residue theorem. – Contour integration – integration around a unit circle - integration along the real axis – Jordan's lemma (stalemate only)- integration of functions with poles on the real axis.

Text Book

For Units I and II

1. Sterling K.Barberian - A FIRST COURSE IN REAL ANALYSIS –
    Year of Publication 2004. Springer (India) Private limited , NewDelhi.
    For Units III , IV and V

2. Ruel V churchill & James ward Brown - COMPLEX VARIABLES AND
    APPLICATIONS(IV-edition)– Year of Publication 1986.
    McGrawHill International Book Company, NewYork.

Reference books

1. Richard R.Goldberg - METHODS OF REAL ANALYSIS-
    Year of Publication 1970
    IBM publishing, New Delhi

2. P.Duraipandian & Laxmi Duraipandian, D.Muhilan –
    COMPLEX ANALYSIS - Year of Publication 1988
    Emerald Publishers,135,Anna Salai, Chennai – 600002

III YEAR

PAPER VII   **OPERATIONS RESEARCH**

PAPER CODE P07UMA07

UNIT I

Introduction – Definition of O.R. – Scope, phases and Limitations of O.R. – Linear Programming Problem - Graphical Method **-** Definitions of bounded, unbounded and optimal solutions – procedure of solving LPP by graphical method – problems – Simplex technique Definitions of Basic, nonbasic variables – basic solutions – slack variables and optimal solution, simplex procedure of solving LPP – problems. Two-Phase Simplex method - Procedure of solving an LPP by two-phase simplex method – problems.

UNIT II

Introduction- Balanced and unbalanced T.P, Feasible solution- Basic feasible solution – Optimum solution – degeneracy in a T.P. – Mathematical formulation – North-West Corner rule – Vogell's approximation method (unit penalty method) Method of Matrix minima (Least cost Method) – problems- algorithm of Optimality test (Modi Method) – Problems.

Introduction – Definition of Assignment problem, balanced and unbalanced assignment problem – restrictions on assignment problem – Mathematical formulation – formulation and solution of an assignment problem (Hungarian method) – degeneracy in an assignment problem – problems

UNIT III

Introduction – Definition – Basic assumptions – n jobs to be operated on two machines – problems – n-jobs to be operated on three machines – problems – n-jobs to be operated on m machines – problems .

Definition of Inventory models- Type of inventory models:

(i) Uniform rate of demand, infinite rate of production and no shortage

(ii) Uniform rate of demand, finite rate of replacement   and no shortage

(iii) Uniform rate of demand instantaneous production with shortage - Books works-problems.

UNIT- IV

Definitions -Newspaper boy problem - Inventory model with one price break-problems. Introduction – definition of steady state, transient state and queue discipline, characteristics of a queuing model – Applications of queuing model – Little's formula - Classification of queues – Poisson process – properties of Poisson process.

Models

    (i)   (M/M/1)   :   ($\propto$ /FCFS)

    (ii)   (M/M/1)   :   (N/FCFS)

    (iii)   (M/M/S)   :   ($\propto$ /FCFS) – Problems

UNIT – V

Introduction – definition of network, event, activity, optimistic time, pessimistic time, the most likely time, critical path, total float and free float- Difference between slack and float- Phases of critical path in a PERT network – difference between CPM and PERT – problems

Text Book

    1.   P.K. Gupta, Manmohan and Kanti swarup - OPERATIONS RESEARCH

        9th edition, 2001- Sultan Chand &Sons, Chennai.

Reference Books

    1   S. Kalavathy - OPERATIONS RESEARCH

        2th edition -2002-Publishing House Pvt Limited, NewDelhi.

    2.   P.K. Gupta and D.S.Hira - OPERATIONS RESEARCH

        2th edition, 1986 - S Chand &Co, NewDelhi.

    3.   Hamdy Taha - OPERATIONS RESEARCH

        Year of Publication 1996. Prentice Hall Publications, NewDelhi

III YEAR

PAPER VIII

PROGRAMMING IN C WITH APPLICATIONS TO NUMERICAL ANALYSIS WITHOUT PRACTICALS

PAPER CODE P07UMA08

UNIT I

Structure of C program-character set-constants-variables –operators- Hierarchy of arithmetic operations-writing simple C programs.

UNIT II

Control structure: logical If-If-Else structure Nested If-Else-GO TO-SWTCH structure- LOOP structures: WHILE- DO-WHILE-FOR loop- NESTED loops.

UNIT III

Arrays declaration –Array processing –functions: Naming- Declaration- library functions.

UNIT IV

Algebraic equations: Newton –Raphson method, Bisection method, Regula-falsI method. Matrices and linear algebraic equations: Gauss Elimination –matrix inversion- Gauss Siedel method.

UNIT V

Interpolation: Lagrange's interpolation, Differential Equations: Euler's method-Runge- Kutta method- Predictor –corrector method. Numerical integration: Simpson's 1/3 Rule – Trapezoidal rule.

Text Book

1.   C.Xavier: C LANGUAGE AND NUMERICAL METHODS,
          New Age international limited, New Delhi. 1999

Reference books:

1. Kernighan B.W. and Retchie D.M., THE C PROGRAMMING LANGUAGE, Prentice Hall India, NewDelhi, 1977.

2. S.S. Sastry: INTRODUCTORY METHODS OF NUMERICAL ANALYSIS, 3rd Edn. , Prentice Hall of India, New Delhi, 1999.

III YEAR

APPLICATION ORIENTED SUBJECT

PROBAILITY THEORY

PAPER CODE P07UMAZ01

UNIT I

Introduction- probability Axioms-conditional probability –Baye's theorem – independent events-problems.

UNIT II

Random variable-probability distribution of a random variable-Discrete and continuous variables-problems

UNIT III

Expected value-Functions of a random variable-Moment generating functions-problems

UNIT IV

Two point distribution-Binomial distribution-Poisson distribution-Gamma distribution-Normal distribution - Chebychev's inequality –problems.

UNIT V

Regression model - one way analysis of variance-Two way analysis of variance-problems.

Text Book

1.V.K. Rokatgi - AN INTRODUCTION TO PROBABILITY THEORY AND

MATHEMATICAL STATISTICS – Year of Publication 1985

Wiely Eastern publications, New-Delhi-1985.

Reference Book

1. Marek Fiseh - PROBABILITY THEORY AND MATHEMATICAL

STATISTICS John Wiely and Sons, NewYork.-1956

III YEAR

APPLICATION ORIENTED SUBJECT

GRAPH THEORY

PAPER CODE P07UMAZ02

UNIT I

Introduction-Definition and examples-Degrees-Definition-Theorem 1 and corollary –Theorem 2 and problems.- subgraphs-Definitions-Theorem-1-Operations on Graphs-Definition- Theorem –1

UNIT II

Introduction –walks, trails and paths- Definitions – Theorem –1-Theorem-2-Theorem –3

Connectedness and components -Definitions-. Theorem –1-Theorem-2-Theorem –3 Definition –(distance) - Theorem –1 Definitions-(cut point, bridge) Theorem –1-Theorem-2-Theorem –3-Theorem –4- Blocks: Definition – Theorem –1-Connectivity-Definition – Theorem –1 Definition

UNIT III

Introduction- Eulerian Graphs-Definition-Lemma1- Theorem –1-Koningsberg Bridge Problem corollary I and II Definition – Theorem-Fleury's Algorithm -Hamiltonian Graphs -Definitions- Theorem –1-Theorem-2-Theorem –3(Dirac 1952)-Lemma- definition (closure)- Theorem –1 Theorem-2-corollary-Theoerm (chvatal 1972)

UNIT IV

Introduction-Characterization of Trees- Theorem –1-corollary – Theorem 2 with corollary- Theorem 3 center of a tree- Definition – Theorem

UNIT V   .

Introduction –Definition and Basic properties –Definitions – Theorem – 1- Definitions- Theorem 2 -Definitions - Paths and Connections- Definition- Theorem – 1- Definitions – Theorem 2- Digraphs and Matrices- Definition- Theorem-1-Definition-Theorem2-Definition-Theorem3

Text Book

1. S.Arumugam,S.Ramachandran - INVITATION TO GRAPH THEORY-

Year of Publication 2001- SciTech publications, Chennai.

Reference Books

1. K.R. Parthasarathy - BASICS OF GRAPH THEORY -

Year of Publication 2001- TMH Publishing company Ltd, NewDelhi .

2. S. Kumaravelu & Suseela Kumaravelu - GRAPH THEORY

Year of Publication 1996 – SKV Printers .

3. A. Chandran - A FIRST COURSE IN GRAPH THEORY -

Year of Publication 1997-Macmillan Publishers, Chennai:

III YEAR

APPLICATION ORIENTED SUBJECT

DISCRETE MATHEMATICS

PAPER CODE P07UMAZ03

UNIT I

Connectives : Negation, conjunction, disjunction, WFF Tautologies, equivalence &

Duality – Normal forms : DNF, CNF, PDNF, PCNF, - Theory of Inference calculus validity using truth table – predicate calculus : Predicates, statement Function, variables & Quantifiers – Inference theory of predicate calculus : valid formulae & Equivalences.

UNIT II

Relations & ordering : Relations, properties of binary relation in a set – Functions :

Definition & Introduction, Composition of Functions, Inverse Function, Binary and n-array operations, Hashing Functions – Natural numbers : Peano Axioms & Mathematical induction, Cardinality.

UNIT III

Algebraic systems : Definition & Examples, Semigroups and monoids – definition and examples-Homomorphism of semi groups & monoids, sub semigroups & sub monoids- Polish Expression and their compilation – Polish rotation, conversion of Infix to polish – Group Codes : The Communication model and basic notations of Error correction- Generation of codes by using parity checks- Error recovery in group codes.

UNIT IV

Latices as partially ordered sets : Definition and example- some properties of Latices- sub Latices- Direct product and Homomorphism- Boolean algebra: Definition and Example- sub algebra- Direct product and Homomorphism – Boolean Functions: Boolean forms and Free Boolean Algebra- values of Boolean expression and Boolean Function.

UNIT V

Grammar and Language : Discussion of Grammar- Formal Definition of language – Finite State Machines : Introductory sequential circuit, Equivalence of finite state machines. – Finite state acceptors and Regular Grammars

Text Book

1. J.P. Trembley R.Manohar - DISCRETE MATHEMATICAL STRUCTURES

    WITH APPLICATIONS TO COMPUTER SCIENCE –
    Year of Publication 2001
    Tata McGraw-Hill , NewDelhi.

Reference Books.

1. Prof V.Sundaresan,K.S.Ganapathy Subramaniyan, K.Ganesan-DISCRETE
    MATHEMATICS- Year of Publication 2000
    Tata Mcgraw Hill, NewDelhi

2. L.Lovarz, J. Pelikan, K. Vexztergombi - DISCRETE MATHEMATICS-
    Year of Publication 2002
    Springer International Edition

ALLIED – I

MATHEMATICAL STATISTICS

Paper Code P07USTA01

UNIT I

Random Variable – Discrete and continuous – Distribution Functions – Marginal and Conditional Distributions – Mathematical expectation, Moment generating function – Characteristic function – Chebechev's inequality.

UNIT II

Standard distributions – Binomial, Poisson, Rectangular and Normal distributions. Exact sampling distributions; chi-square distribution, Students 't' distribution – Fisher's 't' distribution, F distribution – Relationship between them.

UNIT III

Correlation and regression – Correlation coefficient, Rank correlation coefficient, Regression Lines, Regression coefficient – Partial and multiple correlation coefficient (for 3 variables only). Curve Fitting: Fitting of a straight line – Fitting of a second degree parabola – Fitting of power curve – exponential curve.

UNIT IV

Concept of population, sample, statistics – parameter, point estimation – Concept of point estimation – Consistency, Unbiasedness efficiency (Cramer-Rao Inequality) and sufficiency (Rao-Balackwell theorem). Methods of estimation, Maximum Likelihood, Moments and Minimum chi-square methods, properties of these estimators – Interval estimation (concept only).

UNIT V

Tests of significance – Large sample test with regard to proportion, mean, difference between means and proportions – Small sample tests based on 't', F and Chi-square tests.

Text Book

1. S.C.Gupta and V.K.Kapoor, Nineth Revised edition (2001),
   Fundamentals of Mathematical Statistics – Sultan chand, New Delhi.

Reference Book:

1. Gupta C.B and Vijay Gupta, (1998),
   An introduction to Statistical Methods - Sultan chand, New Delhi.
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ALLIED   II

FINANCIAL ACCOUNTING

PAPER   CODE   P07UCMA01

UNIT   I

Introduction-accounting concepts and conventions-journal ledger-subsidiary books-trial balance-final accounts of a sole trader with adjustments.

UNIT   II

Bills of exchange-accommodation bills-average due date-account current

UNIT   III

Final accounts of non-trading concerns – receipts and payments account-income and expenditure account-balance sheet.

UNIT   IV

Single entry system-statement of affairs method-conversion method-self balancing ledger.

UNIT   V

Branch accounts-dependent branch stock and debtors system-independent including foreign branch.

Text Book

1. R.L.Gupta and V.K.Gupta- Financial Accounting- Sultan chand, New Delhi.