



St. PETER'S UNIVERSITY

St. Peter's Institute of Higher Education and Research

(Declared Under Section 3 of the UGC Act, 1956)

AVADI, CHENNAI – 600 054

TAMIL NADU

B.Sc. (MATHEMATICS)

Code No. - 310

(Effective From 2009 – 2010)

(Distance Education)

Regulations and Syllabi

(I & II & III Year)

St. PETER'S INSTITUTE OF DISTANCE EDUCATION

Recognized by Distance Education Council and

Joint Committee of UGC – AICTE - DEC, New Delhi

(Ref. F. No. DEC/SPU/CHN/TN/Recog/09/14 dated 02.04.2009 and

Ref.F.No.DEC/Recog/2009/3169 dated 09.09.2009)

St. PETER'S UNIVERSITY
St. PETER'S INSTITUTE OF DISTANCE EDUCATION
Chennai – 600 054.

Code No. – 310
B.Sc. (MATHEMATICS)
(Distance Education)

Regulations and Syllabi
(Effective from 2009 – 2010)

- 1. Eligibility:** Candidates who have passed the Higher Secondary Examination conducted by the Government of Tamilnadu with Mathematics (Academic stream or Vocational stream) as one of the subjects or any other examination recognized as equivalent thereto, are eligible for admission to Three Year B.Sc Programme in Mathematics.
- 2. Duration:** Three Years.
- 3. Medium:** English is the medium of instruction and examination.
- 4. Methodology:** The methodology of distance education includes the supply of self-instructional study materials in print format and in CD, face-to-face instruction for theory and practicals for a limited period during week ends and on holidays, provision of virtual class in phased manner, dissemination of information over e-mail, Student - Support Service at various Centres of the University, Continuous Assessment and End Assessment conducted by the University at various parts of India.
- 5. Weightage for Continuous and End Assessment:** There is no weightage for Continuous Assessment unless the ratio is specifically mentioned in the scheme of Examinations. The End Assessment (EA) has 100% weightage.
- 6. Credit System:** Credit system be followed with 36 credits for each Year and each credit is equivalent to 25-30 hours of effective study provided in the Time Table of the formal system.

7. Scheme of Examinations

First Year

| Code No. | Course Title | Credit | Marks | |
|------------------------|---|-----------|------------|------------|
| | | | EA | Total |
| Theory | | | | |
| 109UTMT01 109UHIT01 | Tamil - I Hindi - I | 6 | 100 | 100 |
| 109UEHT02 | English - I | 6 | 100 | 100 |
| 109UMMT03 | Algebra, Trigonometry and Differential Calculus | 8 | 100 | 100 |
| 109UMMT04 | Integral Calculus, Differential Equations and Laplace Transforms | 8 | 100 | 100 |
| 109UMMT05 | Allied – I: Mathematical Statistics | 8 | 100 | 100 |
| Total | | 36 | 500 | 500 |

Second Year

| Code No. | Course Title | Credit | Marks | |
|------------------------|--|-----------|------------|------------|
| | | | EA | Total |
| Theory | | | | |
| 209UTMT01 209UHIT01 | Tamil - II Hindi - II | 6 | 100 | 100 |
| 209UEHT02 | English – II | 6 | 100 | 100 |
| 209UMMT03 | Vector Calculus, Fourier Transformations and Financial Mathematics | 8 | 100 | 100 |
| 209UMMT04 | Mechanics | 8 | 100 | 100 |
| 209UMMT05 | Allied –II: Financial Accounting | 8 | 100 | 100 |
| Total | | 36 | 500 | 500 |

Third Year

| Code No. | Course Title | Credit | Marks | |
|---------------|---|-----------|------------|------------|
| | | | EA | Total |
| Theory | | | | |
| 309UMMT01 | Algebraic Structures | 6 | 100 | 100 |
| 309UMMT02 | Real and Complex Analysis | 6 | 100 | 100 |
| 309UMMT03 | Operations Research | 8 | 100 | 100 |
| 309UMMT04 | Programming in C with Applications to Numerical Analysis without Practicals | 8 | 100 | 100 |
| 309UMMT05 | Application Oriented subject: Probability Theory | 8 | 100 | 100 |
| Total | | 36 | 500 | 500 |

8. Passing Requirements: The minimum pass mark (raw score) be 40% in End Assessment.

9. Grading System: Grading System on a 10 Point Scale be followed with 1 mark = 0.1 and the conversion of the Grade point as given below.

$$\begin{aligned} \text{Overall Grade Point Average (OGPA)} &= \frac{\text{Sum of Weighted Grade Points}}{\text{Total Credits}} \\ &= \frac{\sum (EA)C}{\sum C} \end{aligned}$$

The Overall Grade: The Overall Grade and Classification of all successful candidates be arrived at from the Overall Grade Point Average as stipulated in the following conversion Table.

| Grade | Over all Grade Point Average(OGPA) | Over all weighted Average marks | Classification |
|--------------|---|--|-----------------------|
| 0 | 9.00 to 10.00 | 90.00 to 100 | First Class |
| A | 8.00 to 8.99 | 80.00 to 89.99 | First Class |
| B | 7.00 to 7.99 | 70.00 to 79.99 | First Class |
| C | 6.00 to 6.99 | 60.00 to 69.99 | First Class |
| D | 5.00 to 5.99 | 50.00 to 59.99 | Second Class |
| E | 4.00 to 4.99 | 40.00 to 49.99 | Third Class |
| F | 0.00 to 3.99 | 0.00 to 39.99 | Fail |

The Grade Sheets of successful candidates provide particulars such as (1) Overall weighted Average Marks, (2) Overall Grade Point Average, (3) Overall Grade and (4) the Overall classification.

10. Pattern of the Question Paper: The question paper for the End Assessment will be set for three hours and for a maximum of 100 marks with following divisions and details.

Part A: 10 questions (with equal distribution to all the units in the syllabus). Each question carries 2 marks.

Part B: 5 questions with either or type (with equal distribution to all the units in the syllabus). Each question carries 16 marks.

The total marks scored by the candidates will be reduced to the maximum prescribed in the Regulations.

11. Syllabus

109UMMT03 – ALGEBRA, TRIGONOMETRY AND DIFFERENTIAL CALCULUS

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 – a conjugate pair – (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 n^{th} derivative – Standard results – Leibnitz formula for the n^{th} 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 – 29.
2. P.R. Vittal.: ALGEBRA, ANALYTICAL GEOMETRY AND TRINOMETRY – Year of Publication, 2000 Margham Publications, 24, Rmaeswaram Road, T.Nagar, Chennai – 17.
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 – 29
4. N.P. Bali – TRIGONOMETRY – Year of Publication 1994. Krishna Prakashn Mandhir, 9, Shivaji Road, Meerut (UP).
5. T.K. Manickavasagam pillai and S. Narayanan.: CALCULUS (Vol I) Year of Publicaton 2004. Vijay Nicole Imprints Pvt. Ltd., C-7, Nelson Chambers, 115, Nelson Manickam Road, Chennai – 29
6. P.R. Vittal.: CALCULUS – Year of Publication 2000. Margham Publications, 24, Rameswaram Road, T.Nagar, Chennai - 17

109UMMT04: INTEGRAL CALCULUS, DIFFERENTIAL EQUATIONS AND LAPLACE TRANSFORMS

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 - $\int \frac{a \sin x + b \cos x}{c \sin x + d \cos x} dx$ $\int \frac{dx}{a^2 \cos^2 x + b^2 \sin^2 x}$ and $\int \frac{dx}{(ax + b)\sqrt{lx^2 + mx + n}}$ 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 $\int_0^{\frac{\pi}{2}} \sin^n x dx$ $\int_0^{\frac{\pi}{2}} \cos^n x dx$ $\int_0^{\frac{\pi}{4}} \tan^n x dx$

$\int \sec^n x dx$ $\int \cot^n x dx$ $\int x^n e^{ax} dx$ 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 – 29.
2. P.R. Vittal: CALCULUS – Year of Publication 2000 Margham Publications, 24, Rameswaram Road, T.Nagar – 17.
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 – 17.
5. S.Narayanan and others – CALCULUS (Vol III) Year of Publication 2004. Vijay Nicole Imprints P Ltd, C-7, Nelson Chambers, 115, Nelson Manickam Road, Chennai – 29.
6. S.Sankarappan and S.Kalavathi – DIFFERENTIAL EQUATIONS AND LAPLACE TRANSFORMATIONS – Year of Publication 2004. Vijay Nicole Imprints P Ltd, C-7, Nelson Chambers, 115, Nelson Manickam Road, Ch-29.

109UMMT05: MATHEMATICAL STATISTICS

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-Blackwell 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, Ninth 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.

209UMMT03: VECTOR CALCULUS, FOURIER SERIES AND FINANCIAL MATHEMATICS

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:

1. P.R. Vittal and V. Malini: VECTOR CALCULUS – Year of Publication 1997 Margham Publications, 24, Rameswaram Road, T.Nagar, Chennai – 17.
2. P.R. Vittal: CALCULUS – Year of Publication 2000, Margham Publications, 24, Rameswaram Road, T.Nagar, Chennai – 17.
3. Sheldon M.Ross – AN ELEMENTARY INTRODUCTION TO MATHEMATICAL FINANCE 2ND Edition – Cambridge University Press – 2005.
4. P. Duraipandian: VECTOR CALCULUS – Year of Publication 1984. S. Viswanathan & CO, 38, Mcnicals Road, Chetput, Chennai – 31.
5. K. Viswanathan & S. Selvaraj: VECTOR CALCULUS – Year of Publication 1984. Emerald Publishers, 135, Annasalai, Chennai – 2.

209UMMT04 – MECHANICS

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 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 in 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, Ch – 2.

209UMMT05 – FINANCIAL ACCOUNTING

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.

309UMMT01 – ALGEBRAIC STRUCTURES

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 Books:

1. M.L. Santiago – MODERN ALGEBRA – Year of Publication 1994, Tata McGraw – 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 – 2.

309UMMT02 – REAL AND COMPLEX ANALYSIS

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 – Dedekind's cut property – square roots – absolute value.

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

UNIT – II:

Intervals – Closed sets – open sets – Neighbourhoods – finite and infinite sets – Heine – Borel covering theorem – Limit of a function at a point – Deleted neighbourhoods – 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 singularity – 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 P Ltd, New Delhi).

For Units III & IV

1. Ruel V Churchill & James ward Brown – COMPLEX VARIABLES AND APPLICATIONS (IV – edition) Year of Publication 1986, McGraw Hill International Book Company, New York.

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 – 2.

309UMMT03 – OPERATIONS RESEARCH

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) : (μ / FCFS)
- (ii) (M/M/1) : (N / FCFS)
- (iii) (M/M/S) : (μ / 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 2ND EDITION – 2002 Publishing House P Ltd, NewDelhi.
2. P.K. Gupta and D.S. Hira – OPERATIONS RESEARCH 2nd edition, 1986 – S Chand & Co Newdelhi.
3. Hamdy Taha – OPERATIONS RESEARCH Year of Publication 1996. Prentice-Hall Publications, New Delhi.

309UMMT04 – PROGRAMMING IN C WITH APPLICATIONS TO NUMERICAL ANALYSIS WITHOUT PRACTICALS

UNIT – I:

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

UNIT – II:

Control structure: Logical If-If-Else structure Nested If-Else-GO TO-SWITCH 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 PRORAMMING LANGUAGE, Prentice-Hall India, New Delhi, 1977.
2. S.S. Sastry: INTRODUCTORY METHODS OF NUMERICAL ANALYSIS, 3rd Edn., Prentice- Hall of India, New Delhi, 1999.

309UMMT05 – APPLICATION ORIENTED SUBJECT: PROBABILITY THEORY

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. Rokotgi – AN INTRODUCTION TO PROBABILITY THEORY AND MATHEMATICAL STATISTICS – Year of Publication 1985 Wiley Eastern publications, New Delhi, 1985.

Reference Book:

1. Marek Fiseh – PROBABILITY THEORY AND MATHEMATICAL STAISTICS John Wiley and Sons, New York – 1956.