

GOVERNMENT ARTS COLLEGE (AUTONOMOUS), KARUR – 639 005

B.Sc. MATHEMATICS COURSE STRUCTURE UNDER CBCS SYSTEM

(For the candidates admitted from the year 2011-2012 onwards)

SEMESTER	COURSE	SUBJECT TITLE	SUBJECT CODE	INSTR. HOURS WEEK	CREDIT	EXAM HOURS	MARKS		TOTAL
							INT	ESE	
I	Tamil - I	Tamil – I	U11L1T1	6	3	3	25	75	100
	English - I	English - I	U11L1E1	6	3	3	25	75	100
	Core Course - I	Differential Calculus and Trigonometry	U11MM1C1	6	5	3	25	75	100
	Core Course - II	Probability and Statistics	-	3	-	-	-	-	-
	First Allied Course – I	Allied Physics - I	U11PH1A1	5	3	3	25	75	100
	First Allied Course - II	Allied Physics – II (Practical)	-	2	-	-	-	-	-
	Environmental Studies	Environmental Studies	UES1	2	2	3	25	75	100
				30	16				500
II	Tamil - II	Tamil – II	U11L2T2	6	3	3	25	75	100
	English – II	English– II	U11L2E2	6	3	3	25	75	100
	Core Course – II	Probability and Statistics	U11MM2C2	3	4	3	25	75	100
	Core Course – III	Analytical Geometry of 3D and Integral Calculus	U11MM2C3	6	5	3	25	75	100
	First Allied Course – II	Allied Physics II (practical)	U11PH2A2P	2	4	3	25	75	100
	First Allied Course – III	Allied Physics III	U11PH2A3	5	3	3	25	75	100
	Value Education	Value Education	UVE2	2	2	3	25	75	100
				30	24				700
III	Tamil – III	Tamil- III	U11L3T3	6	3	3	25	75	100
	English – III	English - III	U11L3E3	6	3	3	25	75	100
	Core Course – IV	Sequences and Series	U11MM3C4	6	5	3	25	75	100
	Core Course – V	Classical Algebra	-	3	-	-	-	-	-
	Second Allied Course I	Allied Chemistry - I	U11CH3A1	5	3	3	25	75	100
	Second Allied Course II	Allied Chemistry – II Practical	-	2	-	-	-	-	-
	Non Core Elective I	Fundamentals of Information Technology	U11CS3N1	2	2	3	25	75	100
				30	16				500
IV	Tamil – IV	Tamil- IV	U11L4T4	6	3	3	25	75	100
	English – IV	English -IV	U11L4E4	6	3	3	25	75	100
	Core Course – V	Classical Algebra	U11MM4C5	2	4	3	25	75	100
	Core Course – VI	Vector Calculus and Fourier Series	U11MM4C6	5	5	3	25	75	100
	Second Allied Course II	Allied Chemistry Practical	U11CH4A2P	2	4	3	25	75	100
	Second Allied Course III	Allied Chemistry III	U11CH4A3	5	3	3	25	75	100
	Skill Based Elective I	Introduction to C & C++	U11MM4S1	2	4	3	25	75	100
	Non Core Elective II	Office Automation and HTML	U11CS4N2	2	2	3	25	75	100
				30	28				800
V	Core Course – VII	Algebra	U11MM5C7	5	5	3	25	75	100
	Core Course – VIII	Real Analysis	U11MM5C8	5	4	3	25	75	100
	Core Course – IX	Differential Equation and Transforms	U11MM5C9	5	4	3	25	75	100
	Core Course - X	Statics	U11MM5C10	6	4	3	25	75	100
	Core Elective I	Operations Research	U11MM5E1	5	5	3	25	75	100
	Skill Based Elective II	Advanced level of C++	U11MM5S2	2	4	3	25	75	100
	Skill Based Elective III	C++ Practical	U11MM5S3P	2	4	3	25	75	100
				30	30				700
VI	Core Course – XI	Complex Analysis	U11MM6C11	6	5	3	25	75	100
	Core Course – XII	Dynamics	U11MM6C12	6	5	3	25	75	100
	Core Course – XIII	Methods in Numerical Analysis	U11MM6C13	6	5	3	25	75	100
	Core Elective - II	Graph Theory	U11MM6E2	5	5	3	25	75	100
	Core Elective - III	Discrete Mathematical Structure	U11MM6E3	6	4	3	25	75	100
	Extension Activities	Extension Activities			1				
	Gender Education	8UEA6	1	1	3	25	75	100	
				30	26				600
TOTAL					180	140			3800

Sl. No.: 1125

Subject Code: U11MM1CI

GOVERNMENT ARTS COLLEGE (AUTONOMOUS) KARUR-05

B.Sc., MATHEMATICS - I SEMESTER – CORE COURSE - I

(For the candidates admitted from 2011 -12 onwards)

DIFFERENTIAL CALCULUS AND TRIGONOMETRY

- UNIT – I** Methods of successive differentiation – Leibnitz’s Theorem and its application – Increasing and Decreasing function – Maximum and Minimum of function of two variables. (Ch 3 & 1.1 – 2.2: Ch 4 & 2.1, 2.2 and Ch 8 & 4 and 4.1[1])
- UNIT- II** Curvature – Radius of Curvature in Cartesian and in Polar co ordinates – Centre of curvature – Evolutes and Involutives. (Ch 10 & 2.1 – 2.6[1])
- UNIT-III** Expansion of $\sin x$, $\cos x$, $\tan x$, - Expansion of $\sin x$, $\cos x$ – Expansions of $\sin x$, $\cos x$, $\tan x$ in powers of x . (Ch 1 & 1.1 – 1.4[2])
- UNIT-IV** Hyperbolic functions – relation between hyperbolic and circular functions – Inverse hyperbolic functions. (Ch 2 & 2.1 – 2.2[2])
- UNIT-V** Logarithm of a complex number – summation of trigonometric series – Difference method – Angles in arithmetic progression method – Gregory’s series. (Ch 3 and Ch 4, 4.1, 4.2 and 4.2[2])

Text Books:

1. T.K. Manichavasagam Pillai and others, ‘Differential Calculus’, S.V. Publications. Chennai – 1985. Revised Edition.
2. S.Arumugam and others, ‘Trigonometry’, New Gamma Publications – 1985 revised edition.

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GOVERNMENT ARTS COLLEGE (AUTONOMOUS) KARUR-05**B.Sc., COMPUTER SCIENCE - I SEMESTER – FIRST ALLIED COURSE - I**

(For the candidates admitted from 2011 -12 onwards)

ALGEBRA AND CALCULUS

UNIT- I Theory of Equations: Relations between roots and co – efficients – Transformation of Equation – Diminishing, Increasing & Multiplying the roots by a constant – Forming equations with the given roots – Rolle’s theorem, Descartes rule of signs (statement only) – Simple problems.

UNIT- II Singular matrices – Inverse of a non – singular matrix using Adjoint method – Rank of a matrix – Consistency – Characteristics equation – Eigen values, Eigen Vectors – Cayley Hamilton theorem (proof not needed) – Simple applications only.

UNIT-III Differentiation - Maxima & Minima – Concavity – Convexity – Points of inflexion – Partial differentiation – Euler’s theorem – Total Differential coefficient (proof not needed) – Simple problems only.

UNIT-IV Evaluation using integration by parts – Properties of definite integrals – Fourier series in the range $(0, 2\pi)$ – odd & Even functions – Fourier Half Range sine and cosine series.

UNIT-V Differential Equations: Variables Separable – Linear Equations – Second order of types $aD^2 + bD + cy = F(x)$ where a, b, c are constants and F(x) is one of the following types (i) e^{kx} (ii) $\sin(kx)$ (or) $\cos(kx)$ (iii) x^n , n being an integer (iv) $e^{kx}f(x)$

Text Book:

1. T.K. Manickavasagam, Pillai & Others, Algebra Volume I, S.V.Publications, 1985 Revised Edition (Units I,II)
2. S.Narayanan, T.K.Manickavasagam Pillai, Calculus, Volume II, S.V. Publications 2003 (Units III, IV, V).

Reference:

1. M.L. Khanna, Differential Calculus, Jaiprakashnath and Co. Meerut - 2004

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Sl. No.: 1127

Subject Code:

U11GE1A1

GOVERNMENT ARTS COLLEGE (AUTONOMOUS) KARUR-05

B.Sc., – I - SEMESTER – FIRST ALLIED COURSE I

(FOR GEOGRAPHY MAJOR)

(For the candidates admitted from 2011 - 12 onwards)

STATISTICS - I

- UNIT- I** Functions and Limitations of Statistics – Uses of Statistics – Collection of data primary and Secondary
- UNIT- II** Classification – Different types of classification – Objectives – Tabulation of data objectives – Forming frequency distribution.
- UNIT-III** Diagrammatic and Graphic representation – Objectives and Difference – Bar diagram – Simple, Component, Compound, Histogram, Frequency Polygon and Curves, Pie- Chart and Ogives.
- UNIT-IV** Measures of central tendency – Properties – Mean, Median, Mode, Harmonic mean, Quartiles, Deciles.
- UNIT-V** Measures of Dispersion – Range, Quartile, Deviation, Mean Deviation about the mean, Standard Deviation and Co efficient of variation.

Text Books:

1. S.P.Gupta, “Elementary Statistical methods”. Sultan Chand and sons, New Delhi.

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GOVERNMENT ARTS COLLEGE (AUTONOMOUS) KARUR-05**B.Sc.– I & III - SEMESTER – FIRST / SECOND ALLIED COURSE – I****(FOR CHEMISTRY & PHYSICS MAJOR)**

(For the candidates admitted from 2011 -12 onwards)

ALLIED MATHEMATICS – I**CALCULUS AND FOURIER SERIES**

UNIT- I Successive differentiation – nth derivative of standard functions (Derivation not needed) simple problems only – Leibnitz Theorem (Proof not needed) and its applications. Curvature and radius of curvature in Cartesian only (proof not needed) – Jacobians of two & Three variables – Simple Problem only.

UNIT- II Evaluation of integrals of types

$$1. \int \frac{dx}{a + b \cos x} \quad 2. \int \frac{dx}{a + b \sin x} \quad 3. \int \frac{(a \cos x + b \sin x + c)}{(p \cos x + q \sin x + r)} dx$$

UNIT-III General properties of Definite integrals – Evaluation of definite integrals of types

$$1. \int_a^b \frac{dx}{(x-a)(b-x)} \quad 2. \int_a^b \sqrt{(x-a)(b-x)} dx \quad 3. \int_a^b \sqrt{\frac{(x-a)}{(b-x)}} dx$$

Reduction formula when n is a positive integer for

$$(1). \int_a^b e^{ax} x^n dx \quad (2). \int_a^b \sin^n x dx \quad (3). \int_a^b \cos^n x dx \quad (4). \int_0^x e^{ax} x^n dx$$

$$(5). \int_0^{f/2} \sin^n x dx$$

without proof (6) $\int_a^{\frac{f}{2}} \sin^n x \cos^n x dx$ and examples.

UNIT-IV Evaluation of Double and Triple integrals in simple cases – Changing the order and evaluating of the double integration. (Cartesian only)

UNIT-V Definition of Fourier Series – Finding Fourier Co efficient for a given periodic function with period $2f$ - Use of Odd and Even functions in evaluation Fourier Co efficient – Half range sine & Cosine series.

Text Books:

1. S.Narayanan, T.K. Manickavasagam Pillai, Calculus, Vol. I S.Viswanathan Pvt Limited, 2003
2. S.Arumugam, Issac and Somasundaram, Trigonometry & fourier Series, New Gamma Publishers, Housur, 1999.

Sl. No.: 1225

Subject Code:

U11MM2C2

GOVERNMENT ARTS COLLEGE (AUTONOMOUS) KARUR-05

B.Sc., MATHEMATICS – II SEMESTER – CORE COURSE – II

(For the candidates admitted from 2011 - 12 onwards)

PROBABILITY AND STATISTICS

- UNIT - I** Theory of Probability – Basic Definition – Axioms – Theorems on Probability – Conditional Probability – Bayes Theorem. (Ch 3: 3.1 – 3.5 and 3.8.5, 3.8.6, 3.9 – 3.15 and 4.2)
- UNIT- II** Random Variables – Discrete and Continuous – Distribution Function – Probability Mass and Density function – Joint probability distribution function. (Ch 5: 5.1 -5.5)
- UNIT-III** Expectation – Variance – Co variance – M.G.F. – Theorems on Moment Generating Function. (M.G.F.). (Ch 6: 6.1 – 6.8, 7.1)
- UNIT-IV** Correlation and Regression – Properties of Correlation and Regression coefficients – Numerical problems only. (Ch 10: 10.1 – 10.4, 10.7 Ch 11: 11.1, 11.1)
- UNIT-V** Theoretical Discrete and Continuous Distributions – Binomial, Poisson, Normal Distributions – Properties – M.G.F. – Recurrence relation for the moments about origin and Mean for the Binomial and Poisson. (Ch 8: 8.4 – 8.4.2, 8.5 – 8.5.4, 8.5.8 and Ch. 9: 9.1 – 9.2.5)

Text Book:

1. Gupta S.C. and Kapoor V.K., ‘Fundamentals of Mathematics Statistics’ Sultan Chand and sons. 11th Edition, 2002.

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Sl. No.: 1226

Subject Code: U11MM2C3

GOVERNMENT ARTS COLLEGE (AUTONOMOUS) KARUR-05

B.Sc., MATHEMATICS - II SEMESTER – CORE COURSE III

(For the candidates admitted from 2011 - 12 onwards)

ANALYTICAL GEOMETRY 3D AND INTERGRAL CALCULUS

- UNIT – I** Sphere – Standard Equation – Length of a tangent from any point – Sphere passing through a given circle – Intersection of two spheres – Tangent plane. (Ch 4 – 35 to 41 [1])
- UNIT – II** Cone and Cylinder. (Ch 5 – 44 to 49)
- UNIT - III** Integration by Parts – Definite integrals and reduction formula. (Ch 1 – 11, 12 and 13[2])
- UNIT -IV** Double integrals – Changing the order of Integration – Triple Integrals (Ch 5 – 2.1,2.2, and 4[2])
- UNIT - V** Beta and Gamma functions and relation between them – Integration using Beta and Gamma functions. (Ch 7 – 2.1 – 2.5 [2])

Text Book:

1. T.K.M. Pillai and others, “Analytical Geometry”, S.V. Publications, 1985 revised edition.
2. T.K.M. Pillai and others, “Integral Calculus”. S.V. Publications.

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Sl. No.: 1227

Subject Code:

U11MM2A2

GOVERNMENT ARTS COLLEGE (AUTONOMOUS) KARUR-05

B.Sc., COMPUTER SCIENCE - II SEMESTER – FIRST ALLIED COURSE II

(For the candidates admitted from 2011 -12 onwards)

NUMERICAL METHODS

- UNIT-I** Solution of Algebraic and Transcendental Equations: Bisection Method – Regula Falsi Method – Newton Raphson Method – Iteration Method – Simple problems. (Ch 3 – 3.1 – 3.4)
- UNIT- II** Solution of Simultaneous Linear Algebraic Equation: Gauss Elimination Method – Gauss Jordon Method – Method of Factorization – Gauss Jacobi Method – Gauss Seidal Method. (Ch 4 – 4.12 – 4.4, 4.8, 4.9)
- UNIT-III** Interpolations: Linear Interpolation – Gregory – Newton forward and Backward interpolation formula – Lagrange’s interpolation formula (for unequal intervals) (Ch 6 – 6.1 – 6.3 and Ch 8 – 8.7)
- UNIT-IV** Numerical Differentiation and Integration: Newton’s formula to compute derivatives – Numerical Integrations – A General Quadrature formula – Trapezoidal rule – Simpson’s 1/3 rule – Simpson’s 3/8 rule. (Ch 9 – 9.1 – 9.3, 9.7 – 9.9, 9.13, 9.14)
- UNIT-V** Numerical Solution of ODE – Taylor series method – Euler’s method – Second order and Fourth order Runge – Kutta methods – Predictor Corrector methods – Milne’s Predictor – Corrector formula. (Ch 11 – 11.6, 11.7, 11.9, 11.12 – 11.17)

Text Book:

1. P.K. Kandasamy, K. Thilagavathy and K. Gunavathy, ‘Numerical Methods’ S.Chand and Co. Ltd. Second revised edition 2003.

References:

1. S.S.Sarstry, ‘Introductory Methods of Numerical Analyses – Prentice Hall of India Pvt Ltd., New Delhi. Third Edition. 2002.
2. M.K. Venkataraman, ‘Numerical Methods in Science and Engineering’.

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Sl. No.: 1228

Subject Code:

U11MM2A3

GOVERNMENT ARTS COLLEGE (AUTONOMOUS) KARUR-05

B.Sc., COMPUTER SCIENCE - II SEMESTER – FIRST ALLIED COURSE III

(For the candidates admitted from 2011 -12 onwards)

OPERATION RESEARCH

- UNIT-I** Operation Research: Introduction – Role of Computers in O.R – Linear Programming formulation – Graphical solution of two variables – Canonical and Standard forms of linear programming problem.
- UNIT- II** Simplex Method – Algorithm – Simplex method for \leq , \geq , Constraints – Big M method – Two Phase method.
- UNIT-III** Transportation Problem: Algorithm – Degeneracy in T.P. – Unbalanced T.P. – Assignment Problem – Algorithm – Unbalanced A.P.
- UNIT –IV** Sequencing Problem: Problem with n jobs and Two machines – Problems with n jobs and three machines.
- UNIT-V** Network – Fulkerson’s Rule – CPM – PERT calculations.

Text Book:

1. Kantiswarup, P.K. Gupta and Man Mohan, ‘Operations Research’. Sultan and Chand Publishers, New Delhi.

References:

1. Hamdy A. Taha, “Operations Research” (7th edition), Mac Millan Publishing company, New Delhi.
2. Pannerselvam. R. “Operations Research”, PHI New Delhi, 6th Printing 2004.

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COE

Sl. No.: 1229

Subject Code:

U11MM2A5 /
U11MM4A2

GOVERNMENT ARTS COLLEGE (AUTONOMOUS) KARUR-05

B.Sc.,– II & IV - SEMESTER – FIRST / SECOND ALLIED COURSE - II

(FOR CHEMISTRY & PHYSICS MAJOR)

(For the candidates admitted from 2011 -12 onwards)

ALLIED MATHEMATICS – I

ALGEBRA, 3D AND TRIGONOMETRY

- UNIT- I** Binomial, Exponential and Logarithmic series (Formulae only) – Summation and approximation related problems.
- UNIT- II** Symmetric, Skew Symmetric, Orthogonal, Hermitian, Skew Hermitian and Unitary matrices – Characteristics equation, Eigen Values, Eigen Vectors – Cayley Hamilton's Theorem (Proof not needed) – Simple applications only.
- UNIT-III** Equation of a Sphere – Tangent plane – Plane section of a sphere – Finding the center and radius of the circle of intersection (simple problems only)
- UNIT-IV** Expansion of $\sin n\theta$, $\cos n\theta$, $\tan n\theta$ (n being a positive integer) – Expansion of $\sin^n \theta$, $\cos^n \theta$, $\sin^n \theta \cos^n \theta$ in a series of sines and cosines of multiples of θ (θ - gives in radians) – Expansion of $\sin \theta$, $\cos \theta$ and $\tan \theta$ in terms of powers of θ (only problems in all the above)
- UNIT-V** Euler's formula for $e^{i\theta}$ – Definition of hyperbolic functions – Formulae involving Hyperbolic functions – Relation between Hyperbolic and circular functions – Expansion of $\sinh x$, $\cosh x$, $\tanh x$ in powers of x – Separation of real and imaginary part of $\sin(x + iy)$, $\cos(x + iy)$, $\tan(x + iy)$, $\sinh(x + iy)$, $\cosh(x + iy)$, $\tanh(x + iy)$, $\tanh^{-1}(x + iy)$.

Text Books:

1. T.K Mancikavasagam Pillai, T. Natarajan, K.S. Ganapathy, Algebra vol.I S.Viswanathan Pvt Limited, Chennai 2004
2. S.Narayanan, T.K. Manickavasagam Pillai, S.Viswatnathan Pvt. Limited, and Vijay Nicole Imprints pvt. ltd. 2004
3. T.K.Manickavasagam Pillai, Analytical Geometry of 3D and vector calculus, New Gamma Publishing House, [1991].

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GOVERNMENT ARTS COLLEGE (AUTONOMOUS) KARUR-05**B.Sc., – II & IV - SEMESTER – FIRST / SECOND ALLIED COURSE – III****(FOR CHEMISTRY & PHYSICS MAJOR)**

(For the candidates admitted from 2011- 12 onwards)

ALLIED MATHEMATICS - III**DIFFERENTIAL EQUATIONS, LAPLACE TRANSFORMS, VECTOR CALCULUS**

UNIT-I Ordinary Differential equations of first order but of higher degree – Equation solvable for x, Solvable for dy/dx, Clairaut's form (Simple cases only) – Linear equations with constant Co efficient – Finding particular integrals in the cases of e, sin (kx), cos (kx), (where k is a constant), X where k is a positive interger, and e f(x) where f(x) is any function of x (only problems in all the above – No Proof needed for any formula)

UNIT- II Formation of Partial Differential equations by eliminating constants and by elimination of arbitrary functions – Definition of general, particular and complete solutions – Singular integrals (geometrical meaning not required) – Solutions of first order equations in the standard forms – $f(p,q) = 0$, $f(y,p,q) = 0$, $f(z,p,q) = 0$, $f_1(x,p) = f_2(y,q)$, $z = xp + yq + f(p,q)$, - Lagrange's method of solving $Pp + Qq = R$, where P,Q,R function of x,y,z – (Geometrical meaning is not needed) – (only problems in all the above – no proof needed for any formula)

UNIT-III Laplace Transforms – Definition – L (e), L (cos(at)), L (Sin (at)), L(t), where n is positive integer, Basic theorems in Laplace Transforms (Formula only) – L[e cos bt], L[e sin bt], [e f(t) – L [f(t)], L [f(t)], L [f(t)] – Inverse Laplace transforms related to the above standard forms – Solving second order ODE with constant co efficient using Laplace Transforms.

UNIT-IV Vector differentiation – Velocity and Acceleration vectors – Gradient of a Vector – Directional derivative – Unit Normal Vector – Tangent plane – Divergence – Curl – Solenoidal and Irrotational vectors – Double Operators – Properties connecting grad., div and curl of a vector.

UNIT-V Vector integration – Line integrals – Conservative force field – Scalar potential – Work done by a force – Surface integrals – Volume integrals – Gauss Divergence Theorem, Stoke's theorem (Statement, application and verification only)

Text Books:

1. S.Narayanan, Differential Equations, S.Viswanathan publishers, 1996
2. S.Narayanan, T.K Manickavasagam Pillai, Calculus Vol.II S. Viswanathan Pvt Limited, 2003
3. M.L Khanna, 'Differential Calculus' Jaiprakash nath and co., Meerut – 2004.

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Sl. No.: 12P6

Subject Code:

U11GE2A2P

GOVERNMENT ARTS COLLEGE (AUTONOMOUS) KARUR-05

B.Sc., – II SEMESTER – ALLIED COURSE II

(FOR GEOGRAPHY MAJOR)

(For the candidates admitted from 2011 -12 onwards)

STATISTICS – II - PRACTICAL

- UNIT- I** Analysis of frequency distribution – Frequency table – Diagrams – Bar diagram – Simple, component, compound – Graphs – Histogram, Frequency polygons curves, and ogives – Pie – diagram.
- UNIT- II** Methods of Measuring Central tendency – Mean, Median, Mode – Methods of measuring dispersion – Quartile deviation, Mean Deviation about mean, standard deviation and Co efficient of variation. (Simple Problems).
- UNIT-III** Methods of Measuring Correlation – Karl Pearson Correlation – Rank Correlation – Spearmans rank correlation (Simple Problems only).
- UNIT-IV** Regression – Regression lines (two variables only) – regression coefficient – Simple problems.
- UNIT-V** Hypothesis testing – Chi – Square test.

Text Books:

1. S.P.Gupta, “Elementary Statistical Methods” Sultan Chand and Sons, New Delhi.
2. V.K. Kapoor and S.P. Gupta, Fundamental of Mathematical Statistics” Sultan and Chand sons, New Delhi. w004

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Sl. No.: 1231

Subject Code:

U11GE2A3

GOVERNMENT ARTS COLLEGE (AUTONOMOUS) KARUR-05

B.Sc., – II - SEMESTER –ALLIED COURSE III

(FOR GEOGRAPHY MAJOR)

(For the candidates admitted from 2011 -12 onwards)

STATISTICS - III

- UNIT-I** Skewness and Kurtosis – Definition, Co efficient of Skewness, Bowleys and Pearson’s – Simple Problems.
- UNIT- II** Correlation – Scatter Diagrams, Karl Pearson’s Coefficient of Correlations – Rank Correlation – Spearman’s Correlation.
- UNIT-III** Regression – Difference between correlation and regression – Regression lines (Two variables only) – Regression coefficient – Simple Problems.
- UNIT-IV** Time Series – Different components – Methods of measuring trend – Moving average and method of least square (Fitting of straight line only)
- UNIT-V** Index number – Definition and uses – methods of measuring index numbers – Laspeyer’s, Paasches, Fishers, Bowleys – Factor reversal test and time reversal test. (Simple problems only).

Text Book:

S.P.Gupta, “Elementary Statistical Methods” Sultan Chand and Sons, New Delhi.

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Sl. No.: 1333

Subject Code:

U11MM3C4

GOVERNMENT ARTS COLLEGE (AUTONOMOUS) KARUR-05

B.Sc., MATHEMATICS – III SEMESTER – CORE COURSE -IV

(For the candidates admitted from the year 2011 – 12 onwards)

SEQUENCES AND SERIES

- UNIT - I** Sequences and subsequence – Limit of a sequence – convergent sequences – Divergent Sequences – Bounded Sequences – Monotone sequences – Operations on convergent sequences – operations on divergent sequences.
(Ch: 2.1 to Ch: 2.8)
- UNIT - II** Limit superior and limit inferior – Cauchy sequence – Series of real numbers – Series with non negative terms – Alternatively series – Conditional convergence and absolute convergence. (Ch: 2.9 to 2.9I, 2.10, 3.1 to 3.3)
- UNIT - III** Test for absolute convergence – Comparison test – Ratio test – Root test – Cauchy condensation test – Problems using the above tests. (Ch: 3.6 to 3.7)
- UNIT - IV** Binomial Theorem for a rational index – m Exponential & Logarithmic series – Summation of Series & Approximations using these theorems.
(Ch 3 – Sections 5 to 11, 14 and Ch 4 – Sections 2,3,5 to 9)
- UNIT - V** General summation of series including successive difference and recurring series. (Ch 5- Sections 2 to 7)

Text Books:

1. Methods of Real Analysis, Richard R. Goldberg (Unit I, II, III).
2. Algebra Vol.I, T.K. Manicavachagam pillai, T. Natarajan, K.S. Ganapathy (Unit IV, V).

References:

1. **Elementary Analysis: The Theory of Calculus, Kenneth A. Ross, Springer Editon.**
2. **A first course in Real Analysis, Robert G. Bartle, Donald R. Sherbet, Johnwiley & Sons.**
3. **Sequences & Series, S. Armugam, A. Thangapandian Issae, New Gamma Publishing house.**

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Sl. No.: 1334

Subject Code: U11MM3N1

GOVERNMENT ARTS COLLEGE (AUTONOMOUS) KARUR-05

B.Sc., - III SEMESTER – NON CORE ELECTIVE - I

(FOR COMPUTER SCIENCE MAJOR)

(For the candidates admitted from 2011 - 12 onwards)

DISCRETE MATHEMATICAL STRUCTURE

- UNIT- I Propositional Logic:**
Statements and Notations, Truth Tables Negation – Conjunction – Disjunction and Other Connection.
- UNIT- II Predicate Calculus:**
Tautologies – Normal Forms – Disjunctive Normal Forms – Conjunctive Normal Forms – Penf and Pdnf.
- UNIT-III Semi Groups and Monoids:**
Definition and Examples – Homomorphism of Semigroups – Sub Semigroups and Submonoids.
- UNIT-IV Lattices:**
Lattices-Partially Ordered Sets – Some Properties of Lattices – Lattices as Algebraic Systems.
- UNIT-V Lattices Homomorphism**
Homomorphism of Lattices – Some Special Lattices – Complete, Complemented and Distributive Lattices.

Text Book:

1. J.P. Trembley and R. Manohar, Discrete Mathematical Structures With Applications to Computer Science, Tata-Mcgraw Hill Publishing Company Ltd.

References:

2. J.L. Gersting, Mathematical Structures for a Computer Science, 3rd Edition, Computer Science Press, Newyork.
3. G. Liu, Elements of Discrete Mathematics, Mcgraw – Hill Book Co.

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Sl. No.:

1441

Subject Code:

U11MM4C5

GOVERNMENT ARTS COLLEGE (AUTONOMOUS) KARUR-05

B.Sc. MATHEMATICS – IV SEMESTER – CORE COURSE V

(For the candidates admitted from 2011 – 12 onwards)

CLASSICAL ALGEBRA

- UNIT-I** Relation Between Roots and Coefficients of Polynomial Equations- Symmetric Functions – Sum of the Powers of the Roots – Newton’s theorem on the sum of the powers of the roots.
(Ch 6 :11 – 14[1])
- UNIT-II** Transformation of Equations – Diminishing, Increasing & Multiplying the Roots By a Constant – Forming Equations With the Given Roots – Reciprocal Equations – All Types – Descartes’s Rule of Signs (Statement Only) – Simple Problems.
(Ch 6 :15 – 21 & 24[1])
- UNIT-III** Inequalities – Elementary Principles – Geometric & Arithmetic Means – Weierstrass Inequalities – Cauchy Inequality – Applications to Maxima & Minima.
(Ch 4 [2]).
- UNIT-IV** Eigen Values, Eigen Vectors of Matrices – Cayley Hamilton’s Theorem (Statement Only) – Symmetric, Skew Symmetric, Orthogonal, Hermitian, Skew Hermitian & Unitary Matrices – Diagonalization – Simple Problems Only.
(Ch 6 : 6.1 – 6.3[3])
- UNIT-V** Theory of Numbers – Prime & Composite Numbers – Divisors of a Given Number N – Euler’s Function (N) and its Value – the Highest Power of a Prime P Contained N Congruence – Fermat’s Wilson’s & Lagrange’s Theorems.
(Ch 5 [2])

Text Books:

1. T.K. Manickavasagam Pillai & Others Algebra Vol. I S.V. Publications – 1985, Revised Edition.
2. T.K. Manickavasagam Pillai & Others Algebra Vol. II S.V. Publications -1985, Revised Edition.
3. S. Arumugam and A. Thangapandi Issac, Modern Algebra, New Gamma Publishing House, 2000.

References:

1. H.S. Hall and S.R. Knight, Higher Algebra, Prentice Hall of India, New Delhi.

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Sl. No.: 1442

Subject Code: U11MM4C6

GOVERNMENT ARTS COLLEGE (AUTONOMOUS) KARUR-05

B.Sc., MATHEMATICS – IV SEMESTER –CORE COURSE VI

(For the candidates admitted from 2011 - 12 onwards)

VECTOR CALCULUS AND FOURIER SERIES

- UNIT-I** Vector Differentiation – Gradient of a Vector – Directional Derivatives – Divergence and curl of a Vector – Solenoidal and Irrotational Vectors – Laplacian Operator – Simple Problems.
- UNIT- II** Vector Integration – Conservative Force Field – Scalar Potential – Work Done by Force – Tangential Line Integral – Normal Surface Integral – Volume Integral – Simple Problems.
- UNIT-III** Gauss Divergence Theorem – Stoke’s Theorem – Green’s Theorem (Without Proof) – Verification of Theorems for Simple Problems.
- UNIT-IV** Fourier Series – Fourier Expansion of a Periodic Function With Period 2π and $2a$ Use of Odd and Even Function in Fourier Series.
- UNIT-V** Half Range Fourier Series – Sine and Cosine Series – Change of Interval – Combination of Series – Harmonic Analysis.

Text Books:

1. P. Duraipandian and Laxmi Duraipandian, Vector Analysis, Emerald Publishers, 1986.
2. T.K. Manickavasagam Pillai & Others Calculus Vol.III S.V. Publications and Vijay Nicole Imprint Pvt Ltd. 2004.

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GOVERNMENT ARTS COLLEGE (AUTONOMOUS) KARUR-05**B.Sc., MATHEMATICS – IV SEMESTER – SKILL BASED ELECTIVE I**

(For the candidates admitted from the year 2011 – 12 onwards)

INTRODUCTION TO C AND C++

- UNIT-I** Evaluation and application of C – Structure of a C program – Data Types – Declarations – Operators – Expressions – Type Conversions – Built-in-functions.
- UNIT-II** Data Input and Output – Control Statements: IF, ELSE-IF, GOTO, SWITCH, WHILE-DO, DO-WHILE, FOR, BREAK and CONTINUE.
- UNIT-III** Functions – Defining and accessing functions – passing parameters of functions – Arguments – Recursive functions – Storage classes – Arrays: Defining and processing arrays – Multi Dimensional Arrays – Passing arrays to functions – Arrays and Strings – String functions – String Manipulations.
- UNIT-IV** Object Oriented Programming: Software Evolution – OOP Paradigm – Concepts, Benefits, Object Oriented Languages and Applications.
- UNIT-V** Introduction to the Basic Concepts of C++ language – Tokens , Keywords, Identifiers, Data Types, Variables, Manipulators – Expressions and Control structures – Functions: Main functions prototyping – Call by Reference – Function Overloading – Friend and Inline functions.

Text Book

“ANSI C”, E. BALAGURUSAMY – Tata McGraw Hill Publishing Company, New Delhi.

Reference Book

1. “OBJECT ORIENTED PROGRAMMING WITH C++” - E. BALAGURUSAMY, Tata McGraw Hill Publishers Ltd, New Delhi 1995.
2. “C++ - The Complete Reference” – Hilbert Schildt, 3rd Edition, Tata McGraw Hill Publishers Ltd, New Delhi 1999.

GOVERNMENT ARTS COLLEGE (AUTONOMOUS) KARUR-05

B.Sc.,– IV SEMESTER – NON CORE ELECTIVE - II

(FOR COMPUTER SCIENCE MAJOR)

(For the candidates admitted from 2011 – 12 onwards)

FORMAL LANGUAGES AND GRAMMERS

UNIT- I Introduction – Notation and Preliminaries – Basic Definitions – Phrase Structure Grammar – Types of Grammars – BACKUS NAUR Form.

UNIT- II Formal Language – Language of a Grammar – Types of Languages – Construction of Grammars to Generate the Given Languages – Finding the Language Generated By the Give Grammar.

UNIT-III Operations on Families of Languages – Union, Product, Star, Reflection, Intersection and Hmorphism.

UNIT-IV Context Free Languages – Derivation Tree – Left Most Derivation and Right Most Derivation – Ambiguous and Unambiguous Grammars.

UNIT-V Normal Form – Chomsky Normal Form – Greibach Normal Form – Theorems – Construction of Grammar in Normal Form.

Text Book:

Introduction to Automata Theory – Rani Sironmani.

Reference Book:

Discrete Mathematics – Prof.T. Veerarajan – Tata McGraw Hill Publishing Company, New Delhi.

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GOVERNMENT ARTS COLLEGE (AUTONOMOUS) KARUR-05**B.Sc., MATHEMATICS – V SEMESTER –CORE COURSE VII**

(For the candidates admitted from 2011-12 onwards)

ALGEBRA

- UNIT I** Groups – Subgroups – Cyclic groups – Order of an element – Cosets and Lagrange's Theorem.
- UNIT II** Normal subgroups and Quotient groups – Finite groups & Cayley Tables – Isomorphism & Homomorphism.
- UNIT III** Rings & Fields – definition & examples – Elementary properties of Rings- Types of Rings – Characteristics of Rings – Subrings – Ideals – Quotient rings – Maximal & Prime Ideals – Homomorphism of Rings – Isomorphism of Rings.
- UNIT IV** Vector Spaces – definition & examples – Subspaces – Matrix of a Linear Transformation – Linear independence, Basis and dimension.
- UNIT V** Linear Transformation rank and Nullity – Linear Transformation span of a set.

TEXT BOOKS

1. N. Arumugam & A. Thangapandi Isaac, Modern Algebra, New Gamma Publishing House – June 1997.

- UNIT – I** - Chapter 3 & section 3.5 to 3.8
- UNIT - II** - Chapter 3 section 3.9 to 3.12
- UNIT – III** - Chapter 4 Section 4.1 to 4.8 & 4.10
- UNIT – IV** - Chapter 5 Section 5.1 to 5.6 except 5.3
- UNIT – V** - Chapter 5 Section 5.3, 5.7, 5.8.

REFERENCE(S)

1. T.K. Manicavachagam Pillai, T. Natarajan, K.S. Ganapathy, Algebra, Vol.I, S. Viswanathan Pvt Limited, Chennai, 2004.
2. M.L. Santiago, Modern Algebra, Arul Publications, Madras, 1988.
3. M.L. Santiago, Modern Algebra, Tata McGraw Hill, 2003.

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GOVERNMENT ARTS COLLEGE (AUTONOMOUS) KARUR-05**B.Sc., MATHEMATICS – V SEMESTER –CORE COURSE VIII**

(For the candidates admitted from 2011-12 onwards)

REAL ANALYSIS

- UNIT I** Real Number system –Field axioms-order relation in \mathbb{R} -Absolute value of real number and its properties-supremum and infimum of a set-order completeness properties-countable and uncountable sets.
- UNIT II** Continuous function – Limit of a function-Algebra of limits-continuity of a function- types of discontinuous-Elementary properties of continuous function-Uniform continuity of a function.
- UNIT III** Differentiability of a function-Derivability and Continuity- Algebra of derivatives- Inverse function theorem-Darboux's theorem on derivatives.
- UNIT IV** Roll's theorem-Mean value theorem on derivatives-Taylor's theorem with remainder-power series expansion.
- UNIT V** Riemann integration – Definition- Darboux's theorem-condition for integrability-integrability of continuous and monotone function-Integral function- properties of integral function-Continuity and integrability of integral function-the first mean value theorem and the fundamental theorem of calculus.

TEXT BOOK(S)

1. M.K.Singhal and A.R.Singhal., A first course in Real Analysis, R.Chand &co,June 1997 edition.
2. Shanthi narayan., A course of mathematical analysis,S.Chand&co,1995.

REFERENCE(S)

1. Tom.M Apostol, Mathematical Analysis.

- UNIT – I** - Chapter 3.[1]
- UNIT - II** - Chapter 7 [1].
- UNIT – III** - Chapter 8 [1].
- UNIT – IV** -
- UNIT – V** -

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GOVERNMENT ARTS COLLEGE (AUTONOMOUS) KARUR-05**B.Sc., MATHEMATICS – V SEMESTER –CORE COURSE - IX**

(For the candidates admitted from 2011-12 onwards)

DIFFERENTIAL EQUATION AND LAPLACE TRANSFORMS

- UNIT I** First order and higher degree differential equation solvable for x, solvable for y, solvable for $\frac{dy}{dx}$ - clairaut's form – conditions of integrability of $Mdx + Ndy = 0$ – Simple problems.
- UNIT II** Particular integrals of second and higher order differential equations with constant co-efficients (simple problems only) linear equations with variable co-efficients – method of variation of Para meters.
- UNIT III** Formation of partial differential equations – general, particular and complete integrals – solutions of PDE of the standard forms – Lagrange's method of solving – charpit's method and a few standard forms.
- UNIT IV** PDE of second order homogeneous equations with const co-efficients – Particular integrals of $F(D,D) Z = f(x,y)$ where $f(x,y)$ is one of the forms e^{ax+by} , $\sin(ax+y)$, $\cos(ax+by)$, $x^r y^s$ and $e^{ax+by} f(x,y)$
- UNIT V** Laplace transforms – standard form – Basic theorems & simple applications Inverse laplace transform – use of laplace transform in solving ODE with constant coefficients.

TEXT BOOK(S)

1. CALCULUS – Volume III S. Narayanan, T.K. manica vachagom Pillary S. Viswanathan Publishers.
2. Differential education and laplace transforms Dr. M.K. Venkataraman Mrs. Manorama sirdhar - The national publishing company.

REFERENCE(S)

1. M.D. Raisinghania, ordinary and partial differential equations, S.Chand & co

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Sl. No.: 1561

Subject Code: U11MM5C10

GOVERNMENT ARTS COLLEGE (AUTONOMOUS) KARUR-05

B.Sc., MATHEMATICS – V SEMESTER –CORE COURSE - X

(For the candidates admitted from 2011-12 onwards)

STATICS

- UNIT I** Forces & Equilibrium – Forces – Resultant of two forces – Three forces related to a triangle – Equilibrium of a particle under three or more forces.
- UNIT II** Forces on a rigid body – Moment – Equivalent systems of forces – Parallel forces – Varignon's Theorem – Forces along a Triangle – Couples – Equilibrium of a rigid body under three coplanar forces – Reduction of coplanar forces into a force & a couple.
- UNIT III** Friction – Laws of Friction – Coefficient of Friction, Angle & Cone of Friction – Limiting equilibrium of a particle on a rough inclined plane, tilting of a body – Simple Problems.
- UNIT IV** Virtual Work – Principle of Virtual Work – applied to a body or a system of bodies in equilibrium – Equation of Virtual Work – Simple problems.
- UNIT V** Strings – Equilibrium of Strings under gravity – Common Catenary – Suspension bridge.

TEXT BOOK(S)

1. M.K.Venkatraman., Statics.,Agasthiyar Publications,2002

REFERENCE(S)

1. A.V. Dharmapadham, Statics, S. Viswanathan Publishers Pvt Ltd., 1979.
2. S.L. Lony, Elements of Statics and Dynamics, Part–I, A.I.T. Publishers, 1991.

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GOVERNMENT ARTS COLLEGE (AUTONOMOUS) KARUR-05**B.Sc., MATHEMATICS – V SEMESTER – ELECTIVE COURSE- I**

(For the candidates admitted from 2011-12 onwards)

OPERATIONS RESEARCH

- UNIT I** Introduction to Operations Research LPP –Formulation of LPP-graphical solution - Simplex Method- Big M Methods-Two-Phase Simplex method.
- UNIT II** Duality in LPP –Formulating of Primal-Dual pair-Duality and simplex method-Dual simplex method.
- UNIT III** Transportation problem – Transportation algorithm – Degeneracy in Transportation Problem, Unbalanced transportation problem– Assignment Problem – Unbalanced Assignment problem.
- UNIT IV** Sequencing & Replacement problems.
- UNIT V** Game theory-two person zero sum game-maxmin and minimax principle-game without saddle point –mixed strategy-graphical method-dominance properties-matrix method.

(In all the Units No Book Work need to be proved – Only applications of the Book works need to be taught)

TEXT BOOK(S)

1. Kanti Swaroop, Gupta, P.K. & Manmohan, Operations Research, Sultan Chand & Co., 13 th edition,2007.

- UNIT – I** - Chapter 1,2,3,4.
- UNIT - II** - Chapter 5
- UNIT – III** - Chapter10,11
- UNIT – IV** - Chapter 12,18
- UNIT – V** - Chapter 17.

REFERENCE(S)

1. Hamdy A. Taha, Operations Research (7th Edn.), Prentice Hall of India, 2002.
2. Richard Bronson, Theory and Problems of Operations Research, Tata McGraw Hill Publishing Company Ltd, New Delhi, 1982.

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Sl. No.: 1563

Subject Code:

U11MM5S2

GOVERNMENT ARTS COLLEGE (AUTONOMOUS) KARUR-05

B.Sc., MATHEMATICS – V SEMESTER –SKILL BASED ELECTIVE - II

(For the candidates admitted from 2011-12 onwards)

ADVANCED LEVEL OF C++

- UNIT I** Classes and Objects-Constructors and destructors-Operator overloading-Type conversions.
- UNIT II** Inheritance – Single Inheritance – Multiple Inheritance –Hybrid Inheritance.
- UNIT III** Polymorphism – Pointers-Virtual functions-Console input / output operations.
- UNIT IV** Files – Classes for file stream operations-Opening, Closing and processing files-end of file detection-file pointers-updating a file.
- UNIT V** Error handling during file operations-command line arguments-Templates-Exception handling..

TEXT BOOK:

E.Balagurusamy.,Object Oriented Programming with C++,Tata McGraw Hill Publishing Ltd., 1995.

REFERENCES:

1. Robert Lafore., Object Oriented Programming with C++,Galgotia,1994.
- 2.Yashwant Kanetkar., Let us C++, BPB Publications.1999.

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Sl. No.: 15P4

Subject Code: U11MM5S3P

GOVERNMENT ARTS COLLEGE (AUTONOMOUS) KARUR-05
B.Sc., MATHEMATICS – V SEMESTER –SKILL BASED ELECTIVE - III

(For the candidates admitted from 2011-12 onwards)

C++ PRACTICALS

1. Write a C++ program to create a student class.
2. Write a C++ program to implement constructor and destructor.
3. Write a C++ program using operator over loading.
4. Write a C++ program using function over loading.
5. Write a C++ program to implement multiple inheritance.
6. Write a C++ program to implement multilevel inheritance.
7. Write a C++ program to implement stack using array.
8. Write a C++ program to implement queue using linked list.
9. Write a C++ program to sort N numbers using quick sort.
10. Write a C++ program for insertion sort.

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Subject Code:

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GOVERNMENT ARTS COLLEGE (AUTONOMOUS) KARUR-05

B.Sc., MATHEMATICS – VI SEMESTER –CORE COURSE - XI

(For the candidates admitted from 2011-12 onwards)

COMPLEX ANALYSIS

- UNIT I** Functions of a Complex variable – Limits – Theorems on Limits – Continuous functions – Differentiability – Cauchy – Riemann equations – Analytic functions – Harmonic functions.
- UNIT II** Elementary transformations – bilinear transformations – Cross ratio – fixed points of Bilinear Transformation – Some special bilinear transformations
- UNIT III** Complex integration – definite integral – Cauchy's Theorem – Cauchy's integral formula – Higher derivatives.
- UNIT IV** Series expansions – Taylor's series – Laurent's series - Zeroes of analytic functions – Singularities
- UNIT V** Residues – Cauchy's Residue Theorem – Evaluation of definite integrals.

TEXT BOOK(S)

1. S.Arumugam, A. Thangapandi Issac, & A. Somasundaram, Complex Analysis, New Scitech Publications (India) Pvt Ltd, 2002.

- UNIT – I** - Chapter 2 section 2.1 to 2.8 of Text Book
- UNIT - II** - Chapter 3 section 3.1 to 3.5 of Text Book
- UNIT – III** - Chapter 6 section 6.1 to 6.4 of Text Book
- UNIT – IV** - Chapter 7 section 7.1 to 7.4 of Text Book
- UNIT – V** - Chapter 8 section 8.1 to 8.3 of Text Book

REFERENCES

1. P.P. Gupta – Kedarnath & Ramnath, Complex Variables, Meerut – Delhi
2. J.N. Sharma, Functions of a Complex variabale, Krishna Prakasan Media(p) Ltd, 13th Edition, 1996-97.
3. T.K. Manickavachaagam Pillai, Complex Analysis, S.Viswanathan Publishers Pvt Ltd, 1994.

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Sl. No.: 1643

Subject Code:

U11MM6C12

GOVERNMENT ARTS COLLEGE (AUTONOMOUS) KARUR-05

B.Sc., MATHEMATICS – VI SEMESTER –CORE COURSE XII

(For the candidates admitted from 2011-12 onwards)

DYNAMICS

- UNIT I** Kinematics Velocity – Relative Velocity – Acceleration – Coplanar Motion – components of Velocity & Acceleration – Newton’s Laws of Motion.
- UNIT II** Central Orbit – Central force – Differential equation to a central orbit in polar & pedal coordinates – Given the central orbit to find the law of force – Kepler’s Laws of Planetary motions.
- UNIT III** Simple Harmonic motion – Simple Pendulum – Load suspended by an elastic string – Projectile – Maximum height reached, range, time of flight – Projectile up / down and motion on inclined plane.
- UNIT IV** Impulsive force – conservations of linear momentum – impact of a sphere & a plane – Direct & Oblique Impact of two smooth spheres – Kinetic energy and Impulse.
- UNIT V** Motion of a rigid body – Moment of Inertia of simple bodies – theorems of parallel & Perpendicular axes – Motion in two-dimension – motion of a rigid body about a fixed axis.

TEXT BOOK(S)

1. P. Duraipandiyan, Vector Treatment as in Mechanics, S. Chand & Co. –June 1997 Edition.

- UNIT – I** - Chapter 1 & Chapter 2 Section 2.1, 2.1.1
- UNIT - II** - Chapter 16
- UNIT – III** - Chapter 12 Sections 12.1 to 12.3 & Chapter 13
- UNIT – IV** - Chapter 14
- UNIT – V** - Chapter 4 Section 4.2 Chapter 17 & Chapter 18

REFERENCE(S)

1. M.K. Venkataraman, Dynamics, Agasthiar Book Depot, 1990.
2. A.V. Dharmapadam, Dynamics, S. Viswanathan Publishers, 1981.

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GOVERNMENT ARTS COLLEGE (AUTONOMOUS) KARUR-05**B.Sc., MATHEMATICS – VI SEMESTER –CORE COURSE - XIII**

(For the candidates admitted from 2011-12 onwards)

METHODS IN NUMERICAL ANALYSIS

- UNIT I** Algebraic & Transcendental equations – Finding a root of the given equation (Derivation of the formula not needed) using Bisection Method, Method of False Position, Newton Raphson Method, Iteration method – Types of errors.
- UNIT II** Finite differences – Forward, Backward & Central differences – Their symbolic relations – Newton’s forward & backward difference interpolation formulae – Interpolation with unevenly spaced intervals – Application of Lagrange’s interpolating Polynomial (Proof not needed) – Divided differences and their properties – Application of Newton’s General Interpolating formula. (Proof not needed).
- UNIT III** Numerical differentiation – Numerical Integration using Trapezoidal rule & Simpson’s first & second rules – Theory & problems.
- UNIT IV** Solutions to Linear systems – Gaussian elimination Method – Jacobi & Gauss Siedal iterative methods – Theory & problems.
- UNIT V** Numerical solution of ODE – Solution by Taylor Series Method, Euler’s Method, Runge Kutta 2nd and 4th order methods (Derivation of the formula not needed) – Theory & problems using Adam’s Predictor Corrector Method & Milne’s Predictor Corrector Methods.

[In all the units the value of a root may be calculated upto 3 decimal accuracy only]**TEXT BOOK(S)**

1. S.S. Sastry, Introductory Methods of Numerical Analysis, Prentice Hall of India Pvt. Limited, 1995.

- UNIT – I** - Chapter 2 & section 2.1 to 2.5 of Text Book
- UNIT - II** - Chapter 3 sections 3.1, 3.3, 6,3.9, .9.1, 3.10, 3.10.1, of Text Book
- UNIT – III** - Chapter 4 Sections 4.2, 4.4, 4.4.1 & 4.4.2 of Text Book
- UNIT – IV** - Chapter 5 Section 5.4 of Text Book
- UNIT – V** - Chapter 6 Sections 6.1, 6.2, 6.4, 6.5, 6.6.1, 6.6.2.

REFERENCE(S)

1. S. Narayanan & Others, Numerical Analysis, S. Viswanathan Publishers, 1994.
2. A. Singaravelu, Numerical Methods, Meenachi Agency, June 2000.

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GOVERNMENT ARTS COLLEGE (AUTONOMOUS) KARUR-05**B.Sc., MATHEMATICS – VI SEMESTER – ELECTIVE COURSE - II**

(For the candidates admitted from 2011-12 onwards)

GRAPH THEORY

- UNIT I** Definition of a Graph – finite & infinite graphs – incidence, degree isolated & pendent Vertices – isomorphisms – sub graphs – walks, paths & circuits – Connected & disconnected graphs – components Euler graphs – Operations on Graphs – More on Euler graphs – Hamiltonian paths & circuits.
- UNIT II** Trees – properties of trees – pendent vertices in a tree – distances & centres in a tree – Rooted & binary trees – Spanning trees – Fundamental circuits – Finding all spanning trees of a Graph – Spanning trees in a weighted graph.
- UNIT III** Cut sets – Properties of a Cut set – all Cut sets in a graph – Fundamental circuits & Cut sets – Connectivity & Separability.
- UNIT IV** Planar and Dual Graphs –Planar Graphs-Kuratowski's two graphs-Different Representations of a Planar graph-detection of planarity-Geometric Dual-Combinatorial Dual.
- UNIT V** Matrix representation of a graph – Incidence matrix – Circuit Matrix – Fundamental Circuit Matrix and rank of the circuit matrix – Cut set matrix – adjacency matrix – Chromatic Number – Chromatic partitioning – Chromatic polynomial.

TEXT BOOK(S)

1. Narsingh Deo, graph Theory with applications to Engineering & Computer Science, prentice Hall of India, New Delhi, 1997.

- UNIT – I** - Chapter 1 & section 1.1 to 1.5 & Chapter 2 Sections 2.2, 2.4, to 2.9
- UNIT - II** - Chapter 3 section 3.1 to 3.10
- UNIT – III** - Chapter 4 Section 4.1 to 4.5
- UNIT – IV** - Chapter 5 Section 5.2 to 5.7.
- UNIT – V** - Chapter 7 Section 7.1, 7.2, 7.3, 7.4, 7.6 to 7.9, and Chapter 8 Sections 8.1, 8.2, 8.3

REFERENCE(S)

1. Dr.S. Arumugam & Dr.S. Ramachandran, Invitation to Graph Theory, Scitech Publications India Pvt Limited, Chennai, 2001.
2. K.R. Parthasarathy, Basic Graph Theory, Tata McGraw Hill Publishing Company, New Delhi, 1994..
3. G.T. John Clark, Derek Allan Holten, A First Look at Graph Theory, World Scientific Publishing company, 1995.

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Sl. No.: 1646

Subject Code:

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GOVERNMENT ARTS COLLEGE (AUTONOMOUS) KARUR-05

B.Sc., MATHEMATICS – VI SEMESTER – ELECTIVE COURSE- III

(For the candidates admitted from 2011-12 onwards)

DISCRETE MATHEMATICAL STRUCTURES

UNIT I PROPOSITIONAL LOGIC: Statements and Notations symbolic representation and Tautologies. Normal forms – Distinctive normal forms – Conjunctive normal forms – Principal disjunctive normal forms – Principal conjunctive normal forms.

UNIT II PREDICATE CALCULUS: Quantifiers – Predicates – Symbolic representations – Free and bound variables the universe of discourse – Theory of inference for the predicate calculus – Formulas involving more than one quantifier.

UNIT III SEMI GROUPS AND MONOIDS: Definition and Examples of semi groups and monoids – Homomorphism of semi groups and Monoids – sub semi groups and sub monoids – Examples

UNIT IV BOOLEAN ALGEBRA: Definition and Examples – Various Boolean identities – Subalgebra – Direct product – Homomorphisms – Minterm Boolean forms – Sum of product of canonical forms – Minimization of Boolean functions – Application of Boolean Algebra – The Karnaugh map method

UNIT V LATTICES: Lattices – Partially ordered set – Some properties of Lattices – as algebraic systems – Sub lattices – Direct products and homomorphisms – some special lattices – Complete complemented of distributive lattices.

TEXT BOOK(S)

1. J.P. Trembley and R. Manohar – Discrete mathematical structures with application to computer science. – Tata McGraw Hill publishing company Ltd.

REFERENCE(S)

1. J.L. Gersting – Mathematical structures for computer Science., Third Edition, Computer Science Newyark
2. G. Liu Element of Discrete Mathematics Mc graw Hill Pvt Ltd.
3. Dr. M.K. Venkataraman, N. Sridharam, N. Chardrasekaran., Discrete Mathematics – National publishing company.

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