5. SCHEME FOR MAIN WRITTEN EXAMINATION AND ORAL TEST:-

B. MAIN WRITTEN EXAMINATION AND ORAL TEST

Subject	Duration	Maximum Marks	Minimum Qualifying Marks for selection	
			SCs, SC(A)s, STs, MBCs/DCs, BCs and BCMs.	Others
(1)	(2)	(3)	(4)	(5)
1. **Paper-I -** General Studies- Descriptive type - Degree Standard	3 Hours	300	306	408
2. **Paper- II -** General Studies- Descriptive type - Degree Standard	3 Hours	300		
3. **Paper-III** Concerned Subject - Descriptive type – P.G. Degree Standard i. Tamil Language and Literature (Code No. 113) ii. English Language and Literature (Code No. 045) iii. Mathematics (Code No. 073) iv. Physics (Code No. 095) v. Chemistry (Code No. 027) vi. Zoology (Code No. 119) vii. Botany (Code No. 020) viii. History (Code No. 060) ix. Geography (Code No. 057)	3 Hours	300		
Interview & Record		120		
Total		**1020**		

(DEO-MAIN EXAMINATION)
PAPER – I
GENERAL STUDIES (DEGREE STANDARD)
TOPICS FOR DESCRIPTIVE TYPE

UNIT 1 Modern history of India and Indian culture Advent of European invasion- Expansion and consolidation of British rule - Effect of British rule on socio-economic factors - Social reforms and religious movements - India since independence - Characteristics of Indian culture - Unity in diversity - race, colour, language, custom - India - a secular state - Organizations for fine arts, dance, drama, music - Growth of rationalist, Dravidian movement in Tamil Nadu - Political parties and populist schemes - National renaissance - Early uprising against British rule - 1857 Revolt - Indian National Congress - Emergence of national leaders - Gandhi, Nehru, Tagore, Netaji - Growth of militant movements -Different modes of agitations - Era of different Acts & Pacts - World war & final phase struggle - Communalism led to partition - Role of Tamil Nadu in freedom struggle - Rajaji, VOC, Periyar, Bharathiar & Others

UNIT 2 General Mental Ability Conversion of information to data - Collection, compilation and presentation of data - Tables, graphs, diagrams - Parametric representation of data -Analytical interpretation of data - School arithmetic - Percentage - Highest Common Factor (HCF) - Lowest Common Multiple (LCM) - Ratio and Proportion - Simple interest - Compound interest - Area - Volume- Time and Work – Probability - Information technology - Basic terms, Communications - Application of Information and Communication Technology (ICT) - Decision making and problem solving - Basics in Computers / Computer terminology.

UNIT 3 Role and impact of science and technology in the development of India and Tamil Nadu. Nature of universe - General scientific laws - Scientific instruments - Inventions and discoveries - National scientific laboratories - Science glossary - Physical quantities, standards and units - Mechanics and properties of matter - Force, motion and energy - Heat, light and sound - Magnetism, electricity and electronics - Atomic and nuclear physics - Astronomy and space science - Elements and compounds - Acids, bases and salts - Oxidation and reduction - Carbon, nitrogen and their compounds - Natural disasters - safeguard measures - Chemistry of ores and metals - Fertilizers, pesticides, insecticides - Biochemistry and biotechnology - Polymers and plastics – Electrochemistry - Main concepts of life science - The cell -basic unit of life - Classification of living organism - Nutrition and dietics - Respiration - Excretion of metabolic waste - Bio – communication - Blood and blood circulation - Endocrine system- Reproductive system- Animals, plants and human life - Govt. policy /organizations on Science and Technology - Role, achievement & impact of Science and Technology - Energy - self sufficiency - oil exploration - Defence Research Organization - Ocean research and development - Genetics - the science of heredity - Environment, ecology, health and hygiene, Bio - diversity and its conservation - Human diseases, prevention and remedies - Communicable diseases and non - communicable diseases - Alcoholism and Drug abuse - Computer science and advancement - Genetic Engineering - Remote sensing and benefits.

PAPER – II
General studies (Degree Standard)
Topics for Descriptive type

UNIT – I Indian polity and emerging political trends across the world affecting India and Geography of India

Indian polity:- Constitution of India - Preamble to the constitution - Salient features of constitution - Union, state and territory - Citizenship - rights and duties - Fundamental rights - Directive principles of state policy - Fundamental duties - Human rights charter - Union executive - Union legislature – parliament - State executive - State legislature – assembly - Status of Jammu & Kashmir - Local government - panchayat raj - Indian federalism - center state relations

- Judiciary in India - Rule of law /Due process of law - Emergency provisions - Civil services in India - Administrative Challenges in a welfare state - Complexities of district administration - Elections - Election Commission Union and State -Official language and Schedule – VIII - Amendments to constitution - Schedules to constitution

c. Emerging political trends across the world affecting India Foreign Affairs with special emphasis on India's relations with neighbouring countries and in the region -Security and defence related matters - Nuclear policy, issues and conflicts-The Indian Diaspora and its contribution to India and the world.

d. Geography of India Earth and universe - Solar system - Atmosphere, hydrosphere, lithosphere - Monsoon, rainfall, weather and climate - Water resources - rivers in India - Soil, minerals & natural resources - Natural vegetation - Forest & wildlife - Agricultural pattern, livestock & fisheries - Transport & communication - Centers of trade, commerce & art - Social geography - population - density and distribution - Natural calamities - disaster management - Bottom topography of Indian ocean, Arabian Sea and Bay of Bengal - Climate change - impact and consequences - mitigation measures - Pollution Control

Candidates may choose to answer EITHER the Tamil question only in Tamil OR the English question only in English. Candidates writing in English shall if they choose to answer the Tamil question, write only in Tamil

2. Tamil language, Tamil society it's culture and Heritage / English Language

1. நாகரீகமும் பண்பாடும் - தமிழர் தோற்றமும் பரவலும்
2. பண்டைத் தமிழர் வாழ்வியல் சிந்தனைகள் - வீரம், காதல், அறம், அறக்கோட்டு வழிபாடுகள் மற்றும் சடங்குமுறைகள்.
3. தமிழர் சமயமும் பண்பாட்டு நெறிமுறைகளும் - சைவம், வைணவம்
4. தமிழர் பண்பாட்டுக் கலையும், நாகரீகமும் - இயல், இசை, நாடகம், ஓவியம், மருத்துவம், சிற்பம், நாட்டுப்புறக் கலைகள்.
5. தற்கால வாழ்வில் தமிழர் சமூக வாழ்க்கை - சாதி, சமயம், பெண்கள், அரசியல், கல்வி, பொருளியல், வணிகம், வெளிநாட்டுத் தொடர்புகள்.

(OR)

English Language Skills

4. Précis writing.
5. An Essay writing on current issues.
6. Comprehension of a given passage and answering questions thereupon.

3. Administration of Union and States with special reference to Tamil Nadu State government organization - structure, functions and control mechanism - District administration -role in people's welfare oriented programmes - Industrial map of Tamil Nadu - role of state government -Public Services - role of recruitment agencies - State finance -- resources, budget and financial administration - Use of IT in administration -- e-governance in the State - Natural calamities -strategic planning in the State - Social welfare - Government sponsored schemes with reference to Tamil Nadu - Union government organization - structure, functions and control mechanism - Relationship between State and Union - Industrial map of India -- role of Union government - Public Services -- role of recruitment agencies in Union Government - Union finance -- resources, budget and financial administration - Use of IT in administration -- e-governance in Union Government -Natural calamities -strategic planning by the Union - Social welfare - government sponsored schemes by Government of India

PAPER –III
(Concerned Subject – Descriptive Type)
தமிழ்மொழியும் இலக்கியமும்
கீழே கொடுக்கப்பட்டுள்ளவாறு தாள் I மற்றும் II இணைக்கப்பட்டது
TAMIL LANGUAGE AND LITERATURE (Code No.: 113)
P.G. Degree Standard

தாள் – I

அலகு - 1

மொழியின் இன்றியமையாமை பேச்சுமொழித் தோற்றம் - வளர்ச்சி எழுத்து மொழித்தோற்றம் -வளர்ச்சி

அலகு - 2

குகைக்கல்வெட்டு எழுத்து வளர்ச்சி - சங்ககாலம் - பல்லவர்காலம் - சோழர் காலம் - நாயக்கர் காலம் இக்காலம் - மொழிவளர்ச்சி.

அலகு - 3

திருந்திய மொழிகள் திருந்தா மொழிகள் - தமிழில் பிற மொழிக் கலப்பு - வடமொழி - ஆங்கிலம் பிற மொழிகளில் தமிழின் செல்வாக்கு - தமிழில் வட மொழிக் கலப்பு தற்சமயம், தற்பவம் ஆதல்.

அலகு- 4

தமிழில் முதல் எழுத்துக்கள் - சார்பெழுத்துக்கள், புணர்ச்சி விதிகள், பெயர், வினை, இடை, உரிச்சொல், வேற்றுமை உருபுகள், வினைமுற்று, வினையெச்சம்.

அலகு -5

தமிழ் மொழியின் அகப்பொருள் இலக்கணம் - ஏழு திணைகளின் அமைப்பு முறை, புறப்பொருள் இலக்கணம் - ஏழு திணைகளின் அமைப்பு முறை.

அலகு -6

யாப்புறுப்புகள் - ஆசிரியப்பா, வெண்பா, கலிப்பா, மருட்பா இலக்கணங்கள், புதுக் கவிதைக்கு இலக்கணம் தேவை -. மதிப்பீடு.

அலகு -7

தமிழில் உள்ள அணிகளின் பெயர்கள், உவம அணி, உருவக அணி, சிலேடை அணி வஞ்சப்புகழ்ச்சி அணி, விளக்கங்கள்.

அலகு-8

தமிழீன் தனித்தன்மை, தமிழின் சொற்றொடர் அமைப்பு - தொடர் வகைகள், வட்டார மொழி கிளைமொழி ஒற்றுமை வேற்றுமை - பேச்சுமொழி - எழுத்துமொழி ஒற்றுமை வேற்றுமை.

அலகு -9

இந்திய மொழிக் குடும்பங்கள், திராவிட மொழிக்கும் வட மொழிக்கும் உள்ள இலக்கண வேறுபாடுகள், திராவீட மொழிகளின் உயிர் ஓவியன் - மெய் - ஒலியன்கள் வேறுபாடு.

அலகு- 10

மொழியின் வளர்ச்சியில் சமுதாயப் பின்னணி - மொழியின் வளர்ச்சியில் பிரச்சனைகள், தனித்தமிழ் தேவை, ஆக்கங்கள், எதிர்காலப் பணிகள்.

தமிழ் இலக்கியமும் திறனாய்வும்

தாள் -2

அலகு - 1

சங்க இலக்கிய வகை - தொகை அமைப்பு - பத்துப்பாட்டில் ஆற்றுப்படை நூல்கள் - எட்டுத் தொகையில் கபிலர் - பரணர் - ஔவையார் பாடல்கள்.

அலகு - 2
நீதி நூல்கள் - திருக்குறள் - பழமொழிநானூறு. நீதி நெறி விளக்கம். பாரதியாரின் புதிய ஆத்திச்சூடி,
அலகு - 3
காப்பிய இலக்கியங்கள் - சிலப்பதிகாரம். மணிமேகலை. இராமாயணம். பெரியபுராணம். சீராப்புராணம். இயேசுகாவியம்,
அலகு - 4
பக்தி இலக்கியங்கள் -தேவாரம், நாலாயிரதிவ்வியப்பிரபந்தம், திருவருட்பா, தேம்பாவணி, மஸ்தான் சாகிப் பாடல்கள்.
அலகு - 5
சிற்றிலக்கியங்கள் - வகையும் அமைப்பும், பிள்ளைத் தமிழ், பரணி, உலா, தூது, கலம்பகம், பள்ளு, குறவஞ்சி, உள்ளிட்ட இடைக்காலம் முதல் இக்காலப் பிரபந்தங்கள்.
அலகு - 6
கவிதை இலக்கியம் - இருபதாம் நூற்றாண்டு மரபுக் கவிஞர்களின் படைப்புகள், புதுக் கவிதைப் படைப்புகள்.
அலகு - 7
மொழிபெயர்ப்பு இலக்கியங்கள் - தமிழில் மொழி பெயர்க்கப்பட்ட கவிதை, சிறுகதை, புதினம், நாடங்கள்.
அலகு - 8
நாட்டுப்புறவியல் - விளக்கம், வகைகள், பாடல்கள், கதைகள், நம்பிக்கைகள் - சடங்குகள்.
அலகு - 9
மக்கள் தகவல் தொடர்பியல் - வானொலி, தொலைக்காட்சி - இதழ்கள், சுற்றுலாத் தலங்கள்.
அலகு - 10
படைப்பிலக்கியம் - சிறுகதை, ஓரங்க நாடகம், புதுக்கவிதை, மரபுக் கவிதை, படைத்தல்

ENGLISH LANGUAGE AND LITERATURE (Code No.: 045)
POST GRADUATE DEGREE STANDARD
(Paper I & II furnished below will be clubbed together)

PAPER - I

An outline knowledge of the growth and development of English Literature from the age of Elizabeth to the POST - WAR and Post Modern period. The candidates are expected to be familiar with the major developments during this period as well as with all important literary and critical terms. Their knowledge should be tested with reference to the topics and authors mentioned below:

Unit 1.1
Elizabethan Poetry: Wyatt, Surrey, Sidney and Spenser
Metaphysical Poetry : Donne and Herbet

Unit 1.2
Elizabethan Prose: Sidney, Bacon
Elizabethan Drama: Kyd, Marlow, Ben Jonson, Beaumont and Fletcher
Jacobean Drama: Tourneur, Shakespeare, Middleton, Webster

Unit 1.3
Restoratrion Drama: Congerve, Vanbrugh, Farquher, Sheridan, Goldsmith

Unit 1.4
Prose in the 17th and 18th centureis: Bunyan, Milton, Dryden, Johnson, Swift
The Perodical Essay: Addison, Steele, Goldsmith

Unit 1.5
The Precursors of the Romatic Period: Gray, Collins,Cowper, Goldsmith, Blake, Burns
Romantic Poetry : Wordsworth, Coleridge, Shelley, Keats, Byron

Unit 1.6
Victorian Poetry: Mathew Arnold, Robert Browning, Tennyson, The Pre - Rephaelites - Rosseti

Unit 1.7
The English Noval in the 18th Century: Defoe and the Rise of the Novel, Richardson, Fielding, Smollett, Sterne, Gothic Fiction

Unit 1.8
The Noval in the 19th Century: Jane Austen, Walter scott, Charles Dickens Thomas Hardy, George Eliot, Thackeray.
Prose in the 19th Century: Hazlitt, Charles Lamb,De- Quincey, Arnold, Carlyle, Ruskin, Newman

Unit 1.9
Modern Poetry: Hopkins, W.B. Yeats, T.S. Eliot, D.H. Lawrence, audens, Spender.
Modern Drama: G.B. Shaw, T.S. Eliot, Christopher Fry
Modern Fiction: Conrad, D.H.Lawrence, James Joyce, Virginia Woolf
Linerary Criticism : T.S. Eliot, I.A. Richards, F.R. Leavis, C.S.Lewis

Unit 1.10
Post-War and Post Modern Literature Drama: Osborne, Beckett, Pinter, Stoppard
Fiction: Beckett, Golding, Angus Wilson, Iris Murdoch, Doris Lessing.
Poetry: Philip Larkin, Stephen Spender Ted Hughes

PAPER - II

This paper will test the candidate's in-depth knowledge of the texts prescribed and their ability for critical appreciation.

Unit 2.1
Literary Criticism : Dryden of Dramatic Poetry Coleridge - Biographia Literaria (Chapters 14-22), Wordsworth: Preface to Lyrical Ballads Arnold: The study of Poetry T.S. Eliot: Tradition and Individual Talent

Unit 2.2
Shakespare : Twelth Night, Henry IV Part.I, Hamlet, Macbeth, Othello, The Tempest, Measure for Measure, Julus Ceasar, As you like it.
Unit 2.3
Milton : Paradise Lost Books I, IV, IX, Areopagitica, SamsonAgonistes,Lycidas
The Metaphysicals : Donne, "Canonization" "Ecstasic" Marvell, "his coy Mistress" "An Horatian Ode Upon Cromwell's Return"

Unit 2.4
Dryden: Absalom and Achitophel
Surft: Gulliver's Travels, The Battle of the Books
Gray: Elegy Written in a country Churchyard The Bard
Pope: Epistle to Dr. Arbuthnot Rape of the lock Essay in Criticism.

Unit 2.5
Wordsworth: Immortality Ode, Tintern Abbey
Coleridge: Kubla Khan, The Ancient Mariner
Keats:Ode to a Nightingale Ode on a Grecias Urn Ode to autumn
Shelley: Ode to the west wind to a skylark. Adonais

Unit 2.6
George Eliot: Middlemarch
Thomas Hardy: Tess of the Duberuilles, Mayor of castorbridge
D.H. Law rence: Sons and Lovers

Unit 2.7
Tennyson: Ulysses
Mathew Arnold: The Scholar Gipsy
Robert Browning: Abt Vogler
W.B. Yeats: Byzantium
T.S. Eliot: The Wasteland, Murder in the cathedral
C.B. Shaw: St.Joan
Tennessee Williams: The Glass Menageric

Unit 2.8
Hawthorne : The scarlet Letter
Chinua Achebe: Things Fall Apart
Wole Soyinka: The Road
Saul Bellow : Herzog

Unit 2.9
Mulk Raj Anand : Untouchable, Coolie
Raja Rao: Kanthapura
R.K. Narayan: The Guide
Girish Karnad: Tughlaq

Unit 2.10
Nirad Chaudhuri : Autobiography of an Unknown Indian The continent of circe.
V. S. Naipaul : A House for Mr.Biswas - Bend in the River
Margaret Atwood : Surfacing
Salman Rushdie : Midnight's Children

MATHAMATICS (Code No.: 073)
POST GRADUATE DEGREE STANDARD
(Paper I & II furnished below will be clubbed together)

PAPER-I

I. ALGEBRA Group - examples - subgroup - Normal subgroups - homomorphisms - Isomophism - Cayley's theorem - Cauchy's theorem - Sylow's theorem - Finite ablian groups Rings: Euclidean rings - Polynomial rings - Polynomial over the national field - Polynomial rings over Commutative rings - modules. Division rings - Frobenius theorem. Field: Finite fields - Wedderburn's theorem, Extension Fields - Roots of Polynomials. Galois theory: Elements of Galois theory, Solvability of radicals. Linear Transformations: Canonical forms, Nilpotent transformations

II. REAL ANALYSIS Limit, Continuity, types of discontinuities, infinite limits, function of bounded variation, elements of metric spaces. Reimann Integral - Fundamental theorem of calculus - mean value theorem. Reimann - stieltjes Integral, Infinite series and infinite products, sequences of functions, Fourier services and Fourier Integrals. Outer measure, measurable sets and

Lebesque measures, measurable functions. Littlewoods three principles. Lebesque Integral of bounded function over a set of finite measure. Integration of a non negative function. General Lebesque Integral.

III. COMPLEX ANALYSIS Local properties of analytic functions - Removable singularities Taylor's theorem - Zeros and poles, local mapping - maximum principle - Harmonic functions - Definitions & basic properties - mean value property - Poission's formula - Schwarz's theorem - reflection principle - power series expansions - weierstrassis theorem - Taylor's series, Laurents series, partial fractions and factorisation - Infinite products - Canonical products - gamma functions, stvilling's formula, Entire functions, jensen's formula - Hadamard's theorem.

IV. DIFFERENTIAL GEOMETRY Curves, analytic representation, arc length, tangent, oscillating plane, Curvature, torsion, formula of frenet, Contact, natural equations, helics involutes & evolutes, Elementary theory of surfaces - Analytic representation first & second fundamental forms, normal - tangent form, developable surfaces, Euler's theorem, Dupin's indicatries - Conjugate directions, Triply orthogonal system of surface, Fundamental Equations: Gauss, Gauss - Weingastern, Codassi, Curvilinear, Co-ordinates in space. Geodesics on surface. Geodesic Curvature, Goodesics, Geodesic Coordinates, surfaces of constant curvature, rotation of surfaces of conotant curve.

V. OPERATIONS RESEARCH Origin & Development of operation's research, Nature & Characteristics of O.R. Models in O.R. General solution methods for O.R.models, uses and limitations of O.R.

LINEAR PROGRAMMING Formulation of problem, graphical solutions, standard form. Definition of basic solution, degenerate solution, simplex method, Definition of artificial variable.

TRANSPORTATION PROBLEM Definition, solutions to transportation problem - initial feasible solution - opimatil test - Degenerary - Travelling salesman problem. Sequenceing : Processing n jobs through m machines, Replacement of equipment that deterriorates or falls suddenly.

VI. TOPOLOGY Topological spaces & continuous functions, metric topology, Connectedness, compactness, countability and separation axiom, Fundamental group and covering spaces.

PAPER - II

I. MECHANICS:- STATICS:- Equiliburium of a system of particles, work and potential energy, friction, commoniatenary principles of virtual work - stability of equilibrium of forces in three dimensions. DYNAMICS:- Rectilinear motion - motion with constant acceleration motion under gravity - motion along an included plane - motion under gravity in a resisting medium Impalsive forces & Impact, Principles of Conservation of Linear momentum, Collision of two smooth spheres - Direct Impact of sphere on a fixed plane - Projectiles - Circular motion of a particle, Central orbits, moments of enertia, motions of a rigid body about a fixed axis - K.E. of rotation - moment of momentum - motion of a circular disc - hoop or a sphere rolling down an inclined plane.

II. DIFFERENTIAL EQUATIONS:- Linear differential equations of higher order - Linear dependence & wronskian basic theory - solutions in power series - Introduction to second order linear equations with ordinary points. Legendre equations and legendre polynomial, Second order equations with regular singular points, Bessel equations. Partial differential equations; first order, complete Integral, general Integral, singular Integral, Compatible systems of first order equation, charpit's method. Partial differential equations of second order - Linear and partial equations with constant Co-efficients Laplace equation - Elementary solutions of Laplace equation.

III. PROBABILITY & MATHEMATICSL STATISTICS: - Probability of an event, Baye's theorem, Variables - random. Discrete & continuous distributions - Expected values & functions. Moment

generating function and Charasteristic functions - Chebychev's inequality statements of uniqueness theorem & inverse theorems on charasteristics functions.

STANDARD DISTRIBUTIONS: Binomial, poisson, normal & uniform Sampling distribution of Statistics based on normal distribution - x^2, F concept of bivariate distributions, Correlation and regression, Linear prediction, rank Correlation Coefficient, Partial & multiple Correlation. Sample moments & their functions. Notion of sample - statistic - x^2 - distribution, t, Fisher's Z disltribution - distribution of regression coefficients.

SIGNIFICANT TESTS: Concepts - parametric tests for small & large samples - x^2 test - test of Independance by contingency table - theory of hypothesis testing - Power function - Most powerful tests Uniformly most powerful test - unbiased tests.

IV. FLUID DYNAMICS:- Compressible flow; effects of compressibility, Linearised theory, thermodynamical consideration, energy equation, plane shock waves, oblique shockwaves, prantle-mayer expansion - Navier stoke's equation - dissipation of energy - diffusion of vorticity condition of no slip - steady flow between concentric rotating cylinder - steady viscos flow in tubes of uniform cross section - uniqueness theorem, Reynolds number, Boundary Layer thoery.

V. GRAPH THEORY:- Graphs and simple graphs, subgraphs, vertex degrees, paths and connection, cycles, trees cutedges and bends, cut vertices, Cayle Y's formula, connectivity the travelling salesman problem, Blocks, Euler Tours, Hamilton cycles, matching and coverings in Bipartite - Graphs, perfect matchings, Edge chrometic number, Vizing's theorem. Independent series - Ramsey's theorem, Turan's theorem, Chromatic number, Brooks theorem.

VI. FUNCTIONAL ANALYSIS:- Fundamentals of normed Linear spaces, bounded Linear maps on Banach spaces, open mapping theorem, converse of Reimann Lebseque Lemma, spaces of bounded linear maps, weak and weak convergence, compact linear maps, geometry of Hilbert space, Approximation and optimasation, Bounded operators of Hilbert spares, spectrum of bounded operators on Hilbert spaces.

PHYSICS (Code No.: 095)
POST GRADUATE DEGREE STANDARD
(Paper I & II furnished below will be clubbed together)

PAPER-I

UNIT I CLASSICAL MECHANICS Generalised co-ordinates - D' Alembertz principle Lagrangian equations and its application - Hamilton's equaiton from variational principle - Principle of Least action - Canonical Transformation - Poison Brackets and Legrange Brackerts - Hamilton - Jacobi eqation - Action angle variable Kepler problem - Theory of small oscillation - Normal modes and frequencies - Linear Triatomic molecule - Rigid body dynamics - Top.

UNIT II RELATIVITY AND SPACE PHYSICS Postulates of special theory of Relativity - Lorentz transformation equaitons and its consequences - simultanity - variation of Mass - Mass - energy relation. Gravitaitonal constant and its determination - Escape velocity and orbital velocity - geostationary orbit and satellite communication - Remote sensing - Perspective of Geophysics.

UNIT III MATHEMATICAL PHYSICS Vector analysis - Gauss theorem, Green's thoerem, Stoke's theorem and thier applications - Matrix - Eigen value and Eigen vector - Trace of Matrix - Cayley - Hamilton theorem - Reduction of Matrix to a diagonal form - solutions of Linear algebraic equations - complex variables - cauchy - Riemann conditions - Cauchy's integral theorem - Residues and singularities - Cauchy's Residue theorem - solution of partial differential equations - Application to heat conduction and wave propogation - Normal modes of strigns and mebranes - Special functions - Bessel, Legendre, Hermite and laguerre differential equations - properties of speical functions.

UNIT IV ELECTRO MAGNETIC THOERY Gauss law - poisson and Laplace equations - solution of Laplace equation in a Rectangular Box - Molecular polarizability and electrical susceptibility - Maxwell's equations - Poynting's theorem - vector and scalar potentials - Gauge invariance - coulomn and Lorentz guages - Lorentz force - equation of continuity - The wave equation - plane waves in a non-conducting medium - Reflection and refraction at a plane inteference between dielectrics - Fresnel's law.

UNIT V ELECTRONICS F E T amplyfiers - DC amplifiers - Darlington Pair amplifier - Differential amplifier - common mode rejection ratio - operational amplifiers - invertor - summer - differentiator - integrator - comparator - Multivibrators - three types - Schmitt Trigger - Phase shift oscillator - Wienbridge oscillator - Principle of radio communication - AM and FM transmission - RADAR principle - Types of scanning - Duplexer - radar becon - uses principles of Television - Television Transmission and reception - interlaced scanning - composite video signal - Yagi antenna - principle of colour T.V.

PAPER - II

UNIT I THERMODYNAMICS AND STATISTICAL Mechanics :- Laws of thermodynamics - Entropy - thermodynamic potentials - maxwell's equaitons and its applicaitons - Gibbs phase rule - phase transition - clausius eleperon equation - Third law of thermodynamics - postulates of classical statistical Mechanics - Liouville's theorem - micro canonical, canonical and grand canonical ensombles - partition function and entropy of an ideal gas - Gibbs Parodox – Black Body radiation and Planck's Radiation - Phonons - Maxwel's distribution and its application - postulates of quantum statistics - Bose Einsting and Fermi Divac Statistics - Applications.

UNIT II OPTICS, SPECTROSCOPY AND MOLECULAR PHYSICS Crystal optics - Different type of laser - thier principle theory and applicaitons - Laser Raman Spectroscopy - applications - Raman effect - Kramer and Heisenberg theory - Raman spectra and their relation with infra red - Molecular structure - NMR, ESR, NQR and mossbar effect - theory, techniques and applications - Coupling schemes - zeeman effect - paschen - Back effect - spectra structure of atomic molecules - rotation, vibration and rotation - vibration spectra - Electronic spectra of diatomic molecules - Frank - Condon principle.

UNIT III QUANTUM MECHANICS Postulates - Schrodinger equation - wave function - Hydrogen atom - first order and second order Perturbations - stark effect - WKB quantization rule - Time dependent perturbation theory - Fermi's golden rule - Adiabatic and sudden Approximation - Scattering Cross section - Born Approximation - Relativistic equation - Freeparticle - Electromagnetic potentials - Energy level in a coulmns field - Dirac's Relativitic equation - Diracs' equaiton for a central field - spin angular momentum - Negative energy states.

UNIT IV SOLID STATE PHYSICS AND NUCLEAR PHYSICS: Crystal classes and systems - 2d, 3d - Laltices - Liquid crystals - crystal growth - Vibration of Monoatomic Lattices - Phonons - Lattice heat Capacity - Planck distribution - Einstein Model - Debye Model of the lattice heat capacity - Thermal conductivity - Energy band in metals and insulators - Semi conductor crystals bandgap-Tight bound approximation - De Hass - Van Alphen effect. Nuclear mass - Binding energy - Nuclear shell model - Liquid drop model - Yukawas;s mesaon theory - Alpha decay - Fermis' theory of βdecay - Nuclear isomersm - Particle detectors - Nuclear fission - Different fusion process - Classification of elementary particles - Isospin quantum numbers - Cosmic rays.

UNIT V DIGITAL ELECTRONICS AND MICROPROCESSOR:- Logic gates - DTL, RTL, TTL and ECL - Half and full adders Half and full substractors - parallel Binary adder - 8421 adder - Alegebric simplification - Hundamental products - sum of products - AND - OR - Networks - Karnaugh map - NAND - NAND - Networks - Counter techniques RS, RST, JK and master and slave flip flop - ripple counters - parallel counters - BCD counter - shift register - series and parllel register - D/A and A/D conversion. Introduction to microprocessor - arlchitecture of MPU 8085 addressing modes - instruction type - software programmes involving addition, subtraction and

logical operations only - Semi conductor memory types - characteristics RAMs - Reprogrammable ROMs.

CHEMISTRY(Code No.: 027)
POST GRADUATE DEGREE STANDARD
(Paper I & II furnished below will be clubbed together)

PAPER-I

1.1 Reaction Kinetics:- Rate laws - rates constant for first, second, third and zero order reaction - Half life period - Arrehenius theory - collission theory - Absolute reaction rate theory - ionic reaction - salt effect - catalysis - Laws of photo chemistry, quantum efficiency - photo physical processes of electronic excited molecules.

1.2 Chemical Equilibrium:- partial molar quantities, gibbs - Dubem equation, Equilibrium constant - temperature dependence of equilibrium constant - phase rule and its applicantions to two and three components systems.

1.3 Solid State:- Gystal systems - designation of crystal faces, lattice structure and unit cell - law of rational indices - Bragg's law and x rays diffractrion by crystals - schottky and Frenkel defects - Electrical properties - Insulators and semiconductors - band theory of solids.

1.4 Electrochemistry:- Types of Reversible electrodes - Nearnst equation - calculation of thermo dynamic quantities of cell reactions - everpotential and hydrogen over voltage - Determination of pka of acids by potentiometric methods - Kohlransh's law - ostwald's dilution law - Debye - Huckel ensager equation for Strong electrolytes - (no derivation required) - Primary and Secondary fuelcells - corrosion and prevention.

1.5 Structure and Bonding:- Electronic configuration of atoms, Torm symbols and periodic properties of elements, Ionic radii, ionisation potential electron affinity, electronegativity, concept of Hybridization molecular orbitals and electronic configuration of homonuclear and hetero nuclear diatonic molecules, shapes of polyatomic molecules VSEPR theory, symmetry elements and point groups for simple molecules, Bond lengths, Bond angles, bound order and bond energies Types of chemical bound (weak and strong) inter molecular forces, structure of simple ionic and covalent bonds - lattic energy.

1.6 Acids and Bases:- Bronsted and Lewis acids and bases - P^{H} and P^{Ka} acid - base concept in non - aqueous media - HSAB concept - Buffer Solutions. Redox Reactions:- Oxidation numbers, Redox potential, Electro chemical series - Redox indicators.

1.7 Chemistry of Non - transition elements:- General characteristics, structure and reaction of simple compounds - boranes - silicates Oxoacids of N,P,S and halagens - xenoncompounds - inter halegens, Pseudehalides and noble gas compounds.

1.8 IUPAC Nomonclature of simple organic and Inorganic compounds.

1.9 Organic reaction mechanism:- General methods (Kinetic and non Kinetic) of study of reaction mechanisms SN1, SN2 mechanisms - addition substitution, elimination and rearrangements -free radical mechanism - aromatic substitution - formation and stability of reactive intermediate (Carbocations, Carbanion's free radicals, nitrates and benzynes) - Polar effects - Hammett's equation and it modification.

1.10 Chemistry of important organic reaction:- Aldol condensation - Claisen condensation - perkin reaction - cannizare reaction - Fridel craft reaction - Favorski reaction - Strok enamine reaction - Michnel addition - Baeyer - villager reaction - Chichibabin reaction pericyclic reactions -

classification and examples woodward and Hoffmann rules - use of Os O4, NBS, diborane, NaBH4, LiA1H4 in organic Synthosis.

PAPER - II

2.1 Quantum Chemistry:- Planck's quantum theory wave - particle duality, uncertainty principle, operators and commutation relations, postulates of quantum mechanics, schrodinger wave equation, particlein one dimensional box and three dimensional box - harmonic oscillator, rigid retator and hydrogen atom, angular momentum, spin - orbit coupling.

2.2 Classical thermodynamics and elements of statistical thermo dynamics:-First law of thermodynamics:- heat capacity - isothermal adiabatic processes - Thermo chemical laws - Kirchoff's equation second law of thermodynamics, entropy, in reversible and irreversible processes - Gibb's free energy and Helmholtz free energy - Third law of thermodynamics, calculation of entropy, exception to third law - Mathematical and thermo dynamic Probability - Thermodynamic variables interms of partition functions, various types of partition functions, vibrational and electronic parition functions for atomic and molecular gases - sackur - Tetrdo equation - free energy and euthalphy funciton.

2.3 Spectroscopy:-Rotational spectra of diatomic molecules - Isotopic substitution and rotational constants - vibrations spectra of linear symmetric, linear asymmetric and bent tri atomic molecules - electronic spectra - selection rules - nuclear magnetic resonance - chemical shifts - spin - spin coupling - election spin resonance and hyperfine splitting theoretical principles of mass spectroscopy.

2.4 application's of UV, IR, NMR, ESR and mass spectroscopy for structural elucidation of organic compounds, inorganic complexes and free radicals.

2.5 Chemistry of Co-ordination Compounds:-structural aspects, isomorism - octahedral and tetrahedral, crystal - splitting of d. orbitals - CFSE - magnetism and colour of transition, metal ions - charge transfer spectra - crystal field theory and ligand field theory - complexes of II accepter ligands - stereo chemistry of inorganic co-ordination compounds.

2.6 Chemistry of lathanidos and actinides:-Electronic configuration - Separation techniques - exidation states magnetic and spectroscopic properties - use of lanthanide compounds as shift reagents.

2.7 Organemetallic compounds and bio inorganic chemistry:-Metal carbonyls, Metal nitrosyls, metal alkyl, alkenes and arene compounds - organic metallic compounds in catalysis - Chemistry of porphyrins - chlorophyll hemoglobin, myoglobin, ferrodexin, rubredoxin, and cytochromes.

2.8 Stereochemistry:-Elements of symmetry - optical and goemetric isomerism E. Z and R.S notation's - Conformational analysis simple cyclic and acyclic systems - Effects of conformation on reactivity in acyclic compounds and cyclohexanes.

2.9 Carbohydrates:- Classification - configuration and general reactions of monosacharides - Chemistry of glucose, fructose, Surcose and Maltose, Important compounds in chemistry - Dyes - aze, triphenylmethane, and phthalein groups - indigo - alizarin vitamins, hormones - antibiotics - proteins. Polymers: Preperation and uses of polythylene, poly butylene PVC, Nylon - Ziegler - Natta catalysts - Inorganic Polymers such as silicones, Borazines and phosphonitrilic compounds

2.10 Instrumental methods of analysis:-Absorption, partition chromato graphy - Gas chromatography - HPLC - Solvent extraction and ion exchange methods - atomic absorption spectroscopy - Eletroanalytical techniques voltammetry, cyclic voltammetry, polarogaphy, amperonmetry, Coulometry and conductometry, ion - Selective elctrodes- TGA, DTA and DSC.

ZOOLOGY (Code No.: 119)
POST GRADUATE DEGREE STANDARD
(Paper I & II furnished below will be clubbed together)

PAPER-I

UNIT I

Non-Chordata: General Organization - classificaiton with disgnostic features upto class level. Shelled Protozoans, Economic Importance, Fossil Protozoans and thier importance, Neuromotor system in ciliates.

UNIT II

Origin of Metazoa - Theories and Evolution, Economic importance of Portiera, Polymorphism in Hydrogen, Coral reefs - structure - Formation and theories, Origin and evolution of Coelenterates.

UNIT III

Origin - Types of caelom in Bilateria Effects of parasitism on the parasites and Hosts in Helminthes, Coelom in Annelida, Metamorism in Annelida, Mods of Life in polychactes.

UNIT IV

Larval forms and parasitism in Crustacea - Neuro secretion and pheromones in insects.

UNIT V

Adaptive radiation in Gastropods, Oyster culture and pearl formation, Larval forms of Echinodermata and their Significance.

UNIT VI

Retrogresive Metamorphosis, Neotany and affinities of Ascidian.

UNIT VII

Migration in Fishes, Accessory Respiration in Fishes, Strucutre, Affinities, and distribution of Dipnoi, Origin and Evolution of Amphibia.

UNIT VIII

Conquest of Land - Adaptations to live onland - Temporal Vacuities in Reptilia.

UNIT IX

Adaptiue radiation in Birds - Migration in Birds

UNIT X

Study of wild life Mammals in India and Conservation measures.\

PAPER - II

UNIT I

Cell, and Molecular Biology: DNA Structure and function, Replication - Genetic code, RNA and protein synthesis.

UNIT II

Bio Physics Microscopy: - Principles of Electron Microscope, Polarising, Fluroscent, Interference Microscope. Photo - Electric Calorimetry, Freeze drying - freezing, Microtome and Cryostat X-ray - Differaction, - Ultra - Violet and infrared, Spectroscopy and Autoradiography.

UNIT III

Genetics: - Gene concept, one Gene - one polypeptide - concept, Enzyme regulation - Operon concept - GAL and LAC - Operon System. Population Genetics - Hardy - Weinberg Law - Genetic Equilibrium. Radiation Genetics - mechanisms of Chromosomal breakage - Mutagens and Mutagenesis - Carcinogens and carcinogenesis - Human Genetics. Karyotype - Variation in Karyotypes with special reference to syndromes. Genetic Engineering - Present Status.

UNIT IV

Bio-Statics: - Collection of data. Primary and secondary - compiling and sampling methods - frequency distribution, frequency tables - diagrammatic representation - variables - measures of contral tendency, mean, median and mode, measures of dispersion. Standard deviation Standard error - Correlation regression, regression analysis - students "t" test and chi-square test.

UNIT V

Bio-Chemistry: - Structure of carbohydrates, amino acids, proteins, lipids - Glycolysis and Kreb's cycle - oxidation, reduction - oxidative phosphorylation energy conservation and release - cyclic AMP - ATP - saturated and unsaturated fatty acids - cholesterol - enzymes, mechanism of enzyme action, immunoglobulins and immunity - vitamins and ceenzymes - Hormones, their classification, biosynthesis and functions.

UNIT VI

Physiology: - With reference to mammals digestion, role of salivary gland liver, pancreas and intestinal glands in digestion, nutrition, balanced diet in man-assimilation, intermediary metabolism - composition of blood - congulaiton - Transport of oxygen, corbondioxide, blood pigments - mechanism of respiration - muscles, mechanism of muscle contraciton, temperature regulaiton, acid, base balance and homeostasis - Nerve impulse conduction, neurotransmitters - receptors, photo, phone and chemproception - nephron and urine formation - endocrine glands, ovary and pituitary organs and their inter relationship, physiology of reproduction in humans Normonal control of development in man and insect pheromones - Biolumninescence, biological rhythms.

UNIT VII

Immuno-Biology: - Immune resposnes - Primary, Secondary and Theories. Immunity types - Innate, Active and Passive - Cell mediated and Humoral immunity, Types of Antigens and immuno globulins - Cellular Immunity, T & B CELLS - elisa & RIA Techniques - AIDS. Developmental Biology:- Fertilization: Significance, palyspermy Gynogenesis, Androgenesis, Parthenogenesis, Polarity Symmetry, Radiant, Embryomic fields, Differentiation - Nuclear and Chemical factors, Inductors and organisers, Genes and organisers Regeneration - Polarity and Gradient in Regeneration.

UNIT VIII

Resource Ecology and Management, Renewable and Non-Renewable natural resources. Energy resources - conventional and non-conventional. Fresh water marine Estuarine and Mangrove resources. Wild Life, conservation and Management. Air, Water, Soil, Sound pollution. Laws related to Environment - Laws related to Envrionmental Protection Act. Space Ecology and Radiation Ecology.

UNIT IX

Evolution:- Bio-chemical Evolution - cultural Evolution. Present Status of Natural Selection. Genetics and Natural Selection, Adaption and Evolution.

UNIT X

Economic Zoology: - Parasitism and commonsalism - protozoan parasites and diseases - helminth parasites and diseases of man and domestic animals - Beneficial and destructive insects - insect pests and crops and stored products. Control methods. Sericulture, apiculture, poultry, pisciculture and induced breeding, Shell fisheries - Aqua culture practices in Tamil Nadu and their impact on the environment and on agriculture.

BOTANY(Code No.: 020)
POST GRADUATE DEGREE STANDARD
(Paper I & II furnished below will be clubbed together)

PAPER-I

1.1 PLANT DIVERSITY - I:- Structure, reproduction and classification of Algea, Fungi, Lichens, Bryophytes, Pteridophytes and Gymnosperms, Ecology and Evolutionary trends.

1.2 PLANT DIVERSITY - II:- Taxonomy of Angiosperms - classifications of Bentham and Hookers, Engle & Prantl and Hutchinson. Numercial Taxonomy and Chemotaxonomy. Plant Anatomy - wood anatomy; Anomalous Secondary Growth - Anatomy of $C^3 - C^4$ leaves; stomatal types - Nodal Anatomy. Angiosperm Embryology - Incompatibility (gametophytic and Sprophytic) barriers to sexual incompatibility.

1.3 CELL BIOLOGY:- Cell as a unit structure and function - cell Theory. Organization of Prokaryotic and Eukmyotic CellsUltrastructure and Chemistry of plant Cell walls. Cell organelles: Utrastructural details and functions, including cytoplasmic membranes. Organization of Chromosomes and special types of Chromosomes. Cell - division: Mitosis and Meiosis Chromosomal behaviour and their cytological significance.

1.4 MORPHOGENESIS AND TISSUE CULTURE:- Polarity, Symmetry and Totipotency, Morphogenetic Centres of origin and organization. Differentiation dediffer enteations and re-differentiation of cells and organs. Morphogenetic factors. Methodology and application of cell, tissue, organ and protoplas culture from vegetative and reproductive parts - Meristerm culture and its significance. Somatic hybride and cybrids. Synthetic seeds and their appliaction.

1.5 GENETICS - I:- Mendelian Genetics - Development of Genetics and gene concept. Sex chromosomes and sex - linked inhertance, Cytoplasmic inheritance. Chromosome theory of inheritance, linkage, Chromosome mapping and Karyotype analysis. Male sterility and its significance. Population Genetics - Non random mating; Genetic Drift Hand-wienbing law. Plant Breeding - objecties of Plant breeding. Breeding methods for self - pollinated and cross pollinated plants. Selection Methods including distant hybridization method. Role of Polyploidy and induced mutations in crop improvement. Heterosis and Inbreeding Depression.

1.6 GENETICS - II:- Molecular Genetics: Nucleic Acids as genetic material - Structure and role of Nucleic acids in protein synthesis and replication. Modern concept of the gene - cistron, Recon and Muton. Genetic code and regulation of gene Expression; Gene amplification - Transposons, modifiers of gene expression. Meiotic Drive, Penetrance and expressivity, Genic interaction, Multiple factor intraction.

1.7 PLANT PHYSIOLOGY:- Water relations of plants. Ion transport - Photosynthesis: mechanism and importance. Photo - Chemical reactions. Photo - Phosphorylation - Photolysis of water. Quantum efficienty - Carbon fixation in $C^3 - C^4$ cycles. CAM pathway Photo - respiration. Respiration and Fermentation - Respiratory Metabolism-Ghycolysis-TCA cycle (Kreb's) Electron Transport chain - Oxidative Phosphorylation - Pentose Phosphate Pathway - C6/C1 ratio; Pyruvate metabolism. Respiratory control and uncouplers. Nitrogen Metabolism. Biological Nitrogen fixation - Nitrate and sulphate Reduction - Ammonia assimilation GS/GOGAJ Pathyway.

Biosynthesis of Amino-acids-Reductive amination and transmination - Role of ureides and amides. Plant growth substances - Phytochrome and its role. Clacium - caldmoludin concept - Agrochemicals - Stress physiology (abiotic and Biotic Stress). Physiology of fruit development.

1.8 BIOCHEMISTRY AND BIOPHYSICS:- Biopolymers - Structure and Chemistry of Carbiohydrates, liquids, proteins and their monomers. Laws of Thermodynamic, concept of Free - energy. Energy - rich compounds - Bioenergetics: Structure and role of ATP ATP - Cycle. Enzymes - Nature, Properties, Significance of conformation. Nomenclature. Mechanism of Action, Enzyme kinetics - Michelis - Menton constant. Regulation and modulation of enzyme action. Isoenzymes, Enzyme Catalysis and Ramachandran's curve Fats Acids and Lipid Biosynthesis and Metabolism - Gluconeogenesis and B - oxidation. Secondary Metabolities - Alkoloids, Steroids, Terpones, Phenolics, Glycosides - their chemical nature and role.

1.9 MICROBIOLOGY:- Structure, Classification, mode of nutrition, reproduction of viruses, Mycoplasama, Bacteria and Prostozoa. Microbes in air, soil and water. Pollution control using Micro - organisms - Role of microbes in waste water treatment. Biofertilizer, Food Microbiology - Agricultural Microbiology and Industrial Microbiology.

1.10 PLANT PATHOLOGY:- Important plant diseases in Tamil Nadu caused by viruses, Bacteria, Mycoplasma, Fungi and Nemarods, Modes of infection and dissimination. Physiology of Host - Parasite interaction - Host-in-built-defence mechanisms and methods of control - Biocontrol agents. Mechanism of action of microbes in higher plants. Role of Biocides. Integrated pest/pathogen Management.

PAPER - II

2.1 BIOTECHNOLOGY:- Definition - Historical account - Scope and importance of Biotechnology - Genetic Engineering and Gene cloning strategies. Vectors in gene cloning - plasnuids, Cosmids, Bacteriophages - Role in gene - transfer technology - Remombinant DNA Technology - Isolation and purification of DNA - DNA-sequencing; DNA - engineering through cutting and joining; Restriction endonucleases and ligases. Methods of direct gene transfer; Hybridoma technology - potentialities and limitations of Biotechonology. Transfer of novel gene including nif - genes. Expression of plant / animals genes in Bacteria.

2.2 APPLICATION OF BIOTECHNOLOGY IN HUMAN WELFARE AND MEDICINE :- Monoclonal antibodies production; interferon production - Insulin Production - Humulin Production. Application of Biotechnology in Agriculture - Crop improvement and evolving of transgenic plants to combat diseases, insect, pest and abiotic stresses - (Salt, heat, drought and frost). Bt genes and biocide production. Microbial biotechnology - fermentation technology - fermentation as a biochemical process - Bioconversion - alcholic beverages production, Antibiotics, fermentation Production of amino acids and vitamine organic acids production Microbial SCP production.

2.3 ENVIRONMENTAL BOTANY - I :- Definition - History - scope and relationship of Environmental Botany to other Sciences. Modern concept of Ecosystem - Synecology - Modern concept of Biotic - Community. Major and minor communities. Method of studying plant communities, Principles of Phytogeography. Major ecosystems of the world. Their distribution and centres of accumence. Vegetation types of India. Willis age and Area Hypothesis, Wegener's continental Drift hypothesis, Endemism.

2.4 ENVIRONMENTAL BOTANY - II :- Biogeochemical cycles. Plant indicators. Environmental pollution and abatement - water, air, land, radiation, noise, acid, rain green house effect. O Zone depletion, Brand outline of marine ecosystem and management, soil fertility and reciemation. Land application of sewage sludge. Advantages and disadvantages of sludge control and recommendation. Environmental management and legislation - Environmental conservation strategies. Environmental management and legislation Ecotechnology - formal and non - formal environmental education. Afforestation; Green - jobs, creating awareness among target - site

people (villages, Tribals, students, intellectuals, legislators/Policy makers) Inculcating environmental education is curriculam of school, college and University levels.

2.5 BIORESOURCES :- Definition - scope - enumeration and documentation of Bioresources. Energy plantation. Hydrocarbons, Agroforestry, Social Forestry. Conventional fossil - fuel energy. Non - conventional energy sources (solar, wind, tidal, atomic) - Biophotolysis and hydrogen photo - production. Utilization and degradation of cellulose and lignin (litter) sewage. and Garbage disposal. Bio - degradable and non - biodegradeble garbage for waste. Utilization - conversion into manure (vermin compost) Hon - biodegradeble substances disposal by incineration. Biogas from Biomass. Methanogenesis.

2.6 SEED BIOLOGY :- Definition - scope - Importance seed as source of enriched nutrients - Chemical composition of cereals, millets, Common pulses and common oil - seeds. Seed development, phases of growth. Synthesis and Accumulation of food reserves (Storage proteins, Carbohydrates, lipids oils) Physiology of seed dermancy and germination. Methods to overcome seed dermancy. Early physiological events of seed germination. Hydrolysis and mobilisation of reserve food materials, from storage organ tissuses to the germinating embroyonal axis. Seed certification and quaramtime.

2.7 BIOSTATISTICS :- Sampling techniques. Central values (mean, mode, median). Dispersions: absolute Relative Probability: Binominal properties, problems, fitting Poissions, Normal, Skewness, Kurtosis Correlations and Regressions - simple linear Testing - Large sample, T test - x square ANOVA - 2 way Experimental Design - Principles, CRD , RBD, LSD, Missing plots.

2.8 ETHMOBOTANY :- Definition - scope - Tribes of Tamil Nadu - Their Socio - economic status Demography and distribution Flok - lore Ethno - Medicines Linkages with other sciences. Ethno - food - linkages with other sciences. Ethnopolitics Tribal involvement in Biodiversity conservation. Policies and programmes for upliftoment of the various tribes in Tamil Nadu.

2.9 ECONOMIC BOTANY :- Study of plants as sources of food, (cereals, millets, pulses oilseeds) fodder, forage, fatty acids, essential oils, wood, timber, fibre, paper rubber beverages, spices and condiments, drugs, narcotics Resins and gums, dyes and tannings, insecticides and pesticides, ornamental and medicinal - plants as indigenous medicine system (siddha, Ayurveda & Unai) Bioactive compounds.

2.10 BIODIVERSITY CONVERSTION :- The need and necessity, Rio de Jeneiro Earth, Summit (1992) Leipzig (w. Germany) Earth Summit (1995) Problems in patenting and trade related intellectual property rights (TRIPS). General Agreement of Trade and tariff (GATT). World trade Organisation (WTO). Prevention of bio - piracy. Role of wild - life sanctuaries, National Parks. Sacred Groves in Biodiversity Conservation. Red Data Book - Information on endamgered threatened and extinct plants and animals. Stratigies for Biodeiversity Converstion - in situ and ex situ conservation. Role of WWF - World. WILD LIFE FUND.

HISTORY(Code No.: 060)
POST GRADUATE DEGREE STANDARD
(Paper I & II furnished below will be clubbed together)

PAPER-I

HISTORY O F INDIA FROM ANCIENT PERIOD TO 1707 A.D.

UNIT I Geographical features - It's influence on Indian History - Sources of Indian History - Indus valley Civilization - It's extent - Characteristic features - Early Vedic Age - Later Vedic Age.

UNIT II Religious movements - Jainism and Buddhism - Persian and Greek invasions and their effects.

UNIT III The Mauryas - Asoka - His services to Buddhism - Mauryan Administration - Mauryan Art and Architecture - Kushans - Kanishka.

UNIT IV The Age of the Guptas - conquests - Golden Age - Harshavardhana.

UNIT V Sangam Age - Political, social, Economic and religious conditions - status of women - the Pallavas - Their contribution to Art and Architecture. Imperial Cholas - Local Administration - Their contributions to religion and culture.

UNIT VI Turkish Invasion of India - The foundation of Delhi Sultanate - Qutib-ud-din Aibak to Balbon,

UNIT VII Khilji Imperialism - alladdin Khilki - Tugluk Dynasty - Mohamed bin - Tugluk - Feroz Tugluk - Sayyid and Lodi dynasties - Administration of the Delhi. Sultanate - social, economic and cultural conditions.

UNIT VIII Bahmini Kindgom - Muhammed Gawan Vijayanagar Empire - Krishna Deva Raya - His achievements - The Battle of Talikotta - social, economic, religious and cultural conditions - Nayak rule in Tamil Nadu.

UNIT IX The Bakthi movement - Sankara, Ramanuja, Madhwa - Kabir, Guru Nanak, Chaitanya, Ramananda, Vallabha, Rise of the Marathas - Shivaji - His administration - Rise of the Sikhs.

UNIT X The Mughals - Babur, Humayun, Shershah, Akbar to Aurangazab - Administration - Contribution to art and architecture - Religious policy.

PAPER - II

HISTORY OF INDIA FROM 1707 A.D. TO THE PRESENT DAY

UNIT I The advent of Europeans - Their trade settlements in India - The Anglo - French rivalry Establishment of English East India Company's rule in India - From Robert Clive to Dalhousie - Expansion and Consolidation - Administration - Economic policies - Social and educaitonal reforms.

UNIT II Internal resistance - South Indian Rebellion (1800 - 1801), Vellore Mutiny of 1806, Sepoy Mutiny of 1857 - Their impact.

UNIT III The Crown's adminstration - From Lord canning to Lord Mountbatten - growth of local Self Government, Press, Public Services, and Education - The Social and Religious Reform movements in 19th and 20th centuries in India, with special reference of Tamil Nadu.

UNIT IV Indian National Movement - Programme of the early Nationlists - Moderates and Extermists - Gandhian era - The role of Tamil Nadu in Freedom movement.

UNIT V India after Independence - Nehru to Gujral - five year plans - India's role in world affairs Human Rights - Violations in India.

World History

UNIT VI Ancient civilization - The Egyptian, The Mesopotamian the Greek, the Roman and the Chinese.

UNIT VII The Rise and spread of Christinaity and Islam - the rise of towns, guilds, and Universities - Geographical Discoveries - Renaissance, Reformation and Counter - Reformation.
UNIT VIII Age of Revolutions - The Glorious Revolution - The Amercian war of Independence -

The French Revolution - The Industrial and Agrarian Revolutions - The Russian Revolutions - The Chinese Revolution - The Meiji Restoration.

UNIT IX The Unification of Germany and Italy - Colonialism and Imperialism in Asia and Africa in the 19th and 20th centuries - The emergence of Japan and China as great powers.

UNIT X The First World War - The league of Nations - The Second World War - U.N.O. - It's achievements.

GEOGRAPHY (Code No.: 057)
POST GRADUATE DEGREE STANDARD
(Paper I & II furnished below will be clubbed together)

PAPER-I

UNIT 1.1 Geomorphology : Origin and evolution of the earth's crust - Earth movements - Plate Tectonics - Volcanism - rocks weathering - erosion - cycle of Erosion - cycle concepts (Davis and penk) - Rejuvenation - Glacial - marine - karst - land forms - Morphogenetic regions

UNIT 1.2 Climatology : The atmosphere, its structure and composition - temperature (vertical and horizontal distribution) - Pressure (vertical and horizontal distribution) winds - Jet stream - Air masses and Fronts cyclones - Climatic classifications (Koeppen and Thornthwaite).

UNIT 1.3 Oceanography : Bottom morphology of major oceans - tempreature - salinity distribution - currents of the major oceans - Tides - coral reefs - Deposits of the Ocean floor.

UNIT 1.4 Geography of World Resources : Resource - Types - Agricultural resources - Georgraphic Distribution of Rice - Wheat - cotton - Tea - coffee - sugarcane in the world. Aninmal Resources: cattle and sheep farming world fishery resources: major fishing grounds of the world. Mineral resources: Distribution and production of iron ore bauxite and copper in the world. Power resources: Coal - mineral oil - Hydel power - Atomic power. Industries: localisation factors of Iron and Steel - Textile & Cotton and Wollon - ship building - chemical - Automobile Industry. Transportation : Land - water - Air transportation major sea routes of the world Trade: Factors influencing the trade-Trade blocks of the world [EEC, COMMCON and OPEC].

UNIT 1.5 Environmental Studies: Eco system - man and his environment mode of life of people in Hot deserts - Equat rial and Polar regions - concepts of Detorminisim - Possiblise - Prooablisim - Eco system concept - natural hazards - Pollution types - environmental planning and management - Environmental impact Assessment [EIA]

UNIT 1.6 World Population: Growth and distribution - Density of population - Theories of Population: mathus - optimum population - Demographic transition. Migration: types - causes and consequences.

UNIT 1.7 Geography Rural and Urban settlements: Rural settlements: Siting factors - types. Urban settlements: Site and situations - Classification of Towns - Morphology of Urban settlements - concentric zone - Sector - Multiple Nuclei Theories - CBD delimitation of CBD - Rural and Urban Fringe - Urban Fringe - Urban Sprwal - Hierarchy of Urban settlements - Christaller's Central Place Theory - Urban Problems and planning.

UNIT 1.8 Cartography: Historical development - Maps - Types - Map Design and Layout - Quantitative and Qualitative - representations - Point - Line - Area symbols - Map compilation and generalization - Reproduction of Maps - Computer Applications in cartography.

UNIT 1.9 Quantitative Techniques in Geography: Sources of data - sampling Techniques - Descriptive and application aspects of correlations (Simple, Multiple, Rank) - Regression - Chi-

square Test - F Test - T Test - Gravity and potential models - Centrographic measures - Mean and Medran centres - and standard distance.

UNIT 1.10 Modern Trends in Geography: Concept of region - classification - Hierarchy - Regional Planning. Types of planning - Multi level, Tribal Area - Drought prone command Area river Barious of Metropolitan Area planning. Concepts in Remote sensing - Application of Remote sensing - in Environmental studies - Resources inventories - Urban land use planning, Geographical information system (GIS) - System Analysis - Use of Models in geographic research.

PAPER - II

GEOGRAPHY OF INDIA AND TAMIL NADU.

UNIT 2.1 Physiography: Relief - Climate - Floods and drought prone areas Vegetation - Soil

UNIT 2.2 Resources: Fisheries - Sheep and cattle Agriculturist resources: Distribution of Food crops (Rice wheet and Millets) - Plantation (Tea, Coffee, Sugarcane and Rubber) - Fibre crops (cotton and Jute) Agricultural problems - Agriculturist practices in Dry Zone regions - Green Revolution - Globalization of Indian Agriculture.

UNIT 2.3 Mineral Resources: Distribution and production of Coal - Menganese - Mica - Iron ore - Bauxite and copper.

UNIT 2.4 Industries: Localsation of Iron and Steel Cotton Textile - Cement chemical and Electronic Industry.

UNIT 2.5 Population: Growth and distribution - Problems Population of policy of Indian - Urbanuzation - Pollution Problems in Indian Cities.

UNIT 2.6 Transport: Road - Railways - Air and water ways Trade : Internal and International

UNIT 2.7 Planning: Uneveness of Resources - Problems - Necessity for planning - Centralised and decentralised Sectoral Planning Achievements of VIIIth Plans:- Sallent features of IXth Five Year Plan.

UNIT 2.8 TAMIL NADU:Introduction - Physiography - Climate - Flood and drought prone areas - soil - Vegetarion. Resources: Agriculture - Distribution of Rice - Cotton Sugarcane and Tea - Green Revolution.

UNIT 2.9 Mineral Resources: Coal - Iron ore - Manganese Mineral oil. Power Resources: Hydel power-Thermal Power Non Conventional Energy (Wind power) Industries : Cotton Textile - Silk - Cement and paper.

UNIT 2.10 Growth and Distribution - density pattern - Million Cities in Tamil Nadu. Transport: Road ways - and Railways. Planning: Planning Regions of Tamil Nadu - Role of Micro Planning in the Development of Tamil Nadu.

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