

PG TRB

SUBJECT : BOTANY

UNIT-I

- ❖ Viruses - A general account of viruses-Their nature origin purification symptomatology methods, transmission and control measures of viruses - Vector relationships, multiplication, Bacterial viruses, algal viruses and mycoviruses.
- ❖ Bacteria - A general account of bacteria with reference to cell morphology, appendages, envelopes and nutrition, growth and reproduction, structure and replication of nucleic acids in Bacteria plasmids and gene manipulation, classification as per Bergey Manual (1973) economic importance of bacteria.
- ❖ Thallophytes -
 - Algae: A comparative study of the range of structure, organisation, reproduction, life history and classification of algae (Bold and Wynne, 1978). Ecology of Algae-Productivity in the sea, algae as indicators of pollution, algicides, economic importance of algae.
 - Fungi -Classification (Alexopoulos and Mims 1979). A systematic study of the range of structure, reproduction, life cycles phylogeny and affinities of the main classes of fungi; Economic importance of fungi.
 - Lichens - A general account of lichens - Structure, nutrition; reproduction, classification and economic importance of lichens.

UNIT-II

- ❖ Plant Pathology - A general account of plant disease due to fungi, bacteria and viruses with special reference to India Host-microbe interaction, principles of disease control, (physical, chemical and biological methods).
- ❖ Microbiology-Soil microbiology-Soil microbes N₂ fixation and Bio-geochemical cycles-Food and Water microbiology-Microbial flora of fresh and spoiled foods Industrial microbiology-Industrial applications of microbes for the manufacture of Alcohols S.C.P. organic acids.

UNIT-III

- ❖ Bryophytes: Classification (Watson 1963)-Ecology and distribution-Range of structure in gametophyte and sporophyte and their evolutionary trends - Reproduction and Economic importance of Bryophytes.
- ❖ Pteridophytes: Classification (Sporne 1976) - Distribution of extinct and extant forms -comparative study of morphology anatomy of sporophytes-Structure and development of gametophytes of the major groups (Psilopsida Lycopsida Sphenopsida and pteropsida).
- ❖ Gymnosperms: Classification (Sporne 1977) - Distribution of extinct and extant forms -Comparative study of morphology, anatomy and reproductions of major groups - Cycadopsida coniferopsida and Gnetopsida evolution of male and female gametophytes and Economic importance.

UNIT-IV

- ❖ Morphology: The plant body, the root system, the stem the leaf, the inflorescence, the flower, pollination and fertilization, the fruit and the seed, dispersal of fruits and seeds, vegetative reproduction and Germination.
- ❖ Taxonomy: History and classification-Artificial system-Linnaeus, Natural system Jessieu De candolle, Bentham and Hooker, Phylogenetic system-Engler and PrantD. Bessey Hutchinson Recent Trends in systematics-Cyto-taxonomy, Chemotaxonomy, numerical taxonomy. International code of Botanical nomenclature, Herbarium techniques, A critical study of the following families: Ranunculiaceae Magnoliaceae, Polygalaceae, Caryophyllaceae, Rubiaceae, Meliaceae, Lythraceae, Cactaceae, Rhizophoraceae, Oleaceae, Aristalochaceae, Casuarinaceae, Dioscoriaceae, Bignoniaceae, Solanaceae, Lauraceae, Loranthaceae, Euphorbiaceae, Arecaceae, Typhaceae and Poaceae.
- ❖ Economic Botany: Food crops, Cereals, millets, legumes nuts and tropical fruits, sugar yielding crops - spices -Beverage plants - Timbers and pulp yielding plants Minor forest products - Resins, gums, tannin and rubber yielding plants - oil yielding plants - medicinal plants - fibre yielding plants.

UNIT-V

- ❖ Cell Biology: Cytological methods-auto radio graphy - Isolation of cellular components - Fixation - staining - prokaryotes and Eukaryotes. Ultra structure and molecular organization of cell-cell wall, plasma membrane, Endoplasmic reticulum, Mitochondria, Lysosomes and other cell organelle. Plastids - Classification, morphology, structure - functions Cytoplasm - Physical and Chemical properties. Nucleus - morphology, structure and chemistry - Cell division - Mitosis, meiosis, meiosis and their significance chromosome - morphology, fine structure, Types giant chromosome, Isochromosome.
- ❖ Genetics: Mendelian and non-mendelian inheritance - linkage and crossing over. Mutation - Mutagenic agents - structural and chemical basis of mutations in plants cytoplasmic inheritance, Male sterility in plants - Sex determination in plants - sex linked inheritance. Chromosomal aberrations. Molecular genetics - Nucleic acids as genetic material - Types of Nucleic acids -Replication of DNA - Methods and models in DNA repair mechanism - Enzymes - split genes -Jumping and mobile genes - concepts of gene - Cistron, Muton and recon.

UNIT-VI

- ❖ Anatomy: Meristems - General account, classification, various concepts of apical organization of shoots and root apices. Procambium, Cambium and their relationship. Development of Secondary vascular tissues. Simple tissues, conductive tissues Xylem & Phloem. Wood anatomy - variations in wood structure - tyloses Heartwood and sapwood - growth rings. Microtomy: Use of Rotary and Sledge microtomes - whole mounts - Paraffin method - clearing and macerations. Fixation and fixatives: Staining and stains - Histo - chemistry - cellulose, lignin, enzymes, proteins and nucleic acids.
- ❖ Embryology : Microsporogenesis and structure of micro-sporangium - Male gametophyte. Mega sporogenesis and structure of megasporangium - Female gametophyte. Present concept of fertilization, endosperm types - Endosperm haustoria.

UNIT-VII

- ❖ Plant Physiology: Water relations of plants - Mechanisms; of absorption of water passive and active - apoplast symplast concept. Stomatal mechanism and Transpiration - Ascent of Sap. Mineral nutrition - Methods of studying plant nutrition. Essential elements - macro and micro nutrients. Absorption of solutes translocation of solutes - pathway and mechanism. Photosynthesis - Properties of light - interaction between radiant energy and matter. Photosynthetic pigments and pigment systems. Hill Reaction - Photochemical reaction, Photophosphorylation - Cyclic and non-cyclic and calvin cycle. Respiration Glycolysis, Krebs cycle, Electron Transport Nitrogen metabolism - Sources of soil nitrogen, Nitrogen fixation. Legume-Rhizobium symbiosis - biochemistry and physiology. Growth and Development - auxins, cytokinins. Gibberellins, phytochromes - role and mode of action.
- ❖ Bio-chemistry: Chemistry of carbohydrates - classification - structure and function, lipids - classification, occurrence, structure and importance of lipids and phosphates. Proteins - structure, properties and classification of amino acids - peptides - structural organization and classification of proteins Nucleic acids - chemistry of Nucleic acids - structure and properties, location and biological significance of DNA - different types of RNA, their origin, properties and functions. Enzymes - Properties, mode of action, nomenclature and classification - factors affecting enzyme activity.

UNIT-VIII

- ❖ Plant Breeding: Methods of improvement of crops. Plant introduction - Selection Heterosis Hybridization - Polyploidy - Mutation breeding.
- ❖ Bio-Technology: Scope and importance of Bio-technology - Basic techniques Transformation of E.coli cutting and joining DNA molecules - vectors - Plasmids. Cosmids. Application of recombinant DNA technology in Enzyme engineering industries in prevention, diagnosis fermentation and cure of diseases (medicine) in the production of bio-fertilisers, bio-insecticides, Tissue culture.

UNIT-IX

- ❖ Ecology: Importance of ecology, Ecological factors - their classification and interaction Edaphic factors - Water factors - Fire factors - Biotic factor. Synecology classification of plant communities Raunkiaer's life - forms - Ecological succession causes and effects climax concept. Eco system - components and inter relationship. Bio-geo-chemical cycles.
- ❖ Plant Geography: Principles of Plant Geography Dispersal and migration - Types Age and Area hypothesis - continuous range, cosmopolitan, circum polar, circum boreal and circum austral, pantropical Discontinuous distribution - Wegner's theory of continental drift.

UNIT-X

- ❖ Palaeo Botany: Geological time scale - Techniques of fossil study - Types of fossils and different methods of fossilization - Radio carbon dating - study of fossil forms in algae, bryophytes, pteridophytes and Gymnosperms. Conservation of fossil fuels.

Educational Psychology

Unit - 1

Pre-primary Education - Programme of Pre-primary Education - universalization of Primary Education - Equality of opportunity - Secondary and Higher Secondary Education - Need for uniform pattern - Non-formal and Adult Education - Functional Literacy Programme - Programmes for workers in industry - programme for dropouts - Role of Educational institutions in Non-formal Education - Open School / Open University, Quantity and Quality of Education - State and National leave - Unemployment and underemployment - Delinking employment from degrees - Skill development - Vocation Skill oriented education - Man power planning and education Brain drain - Special problems of rural and tribal people - illiteracy and poverty - Eradication of poverty through Education.

Unit - 2

National integration - International understanding - Value Education in action- Nation and health - sanitation - Safety and first aid - Women's education - Education for handicapped Education for gifted - Population Education - Need for protecting the environment - Environmental Education - Language policy - Medium of education - channel of international communication Management of Schools, private, aided, Government, Local authorities - Government Department of education, administration and academic supervision - Headmaster / Headmistress as an administrator and academic supervisor.

History and Culture of Tamil Nadu:

Unit - 3

Political - Spiritual - Religion - Literature - Language - Education - Natural Resources - Trade - Occupations - Historical places - Tourist centers - Arts - Games - Society.



Unit -4

The Learner, Learning process - Learning situation - Significance of Education Psychology to the teacher concept of growth and maturity - development characteristics and trends - Development tasks and education - Development of mental abilities - Attention, inattention and distraction - span of attention, sensation and perception - factors in perception - Errors - concept formation - Piaget's states of cognitive development - concept maps language. Imagination, thinking and reasoning - Psycholinguistics - Implications for the teacher.

Unit -5

Special characteristics of adolescents and their problems, attitudes, interest, group behavior, Discipline Leadership - Nature and importance of learning - individual differences in learning - Learning curves - Transfer of learning - Learning styles - Factors in learning - Types of learning - Trial and error - Conditioning - Classical and operant - Learning by insight - Imitation - Levels of learning - Remembering and forgetting - Learning Disabilities.

Unit - 6

Motivation - Maslow's hierarchy of needs - roles of rewards and punishments - Levels of aspiration - Achievement motivation - Goal as a motivational factor - Nature of intelligence - Theories of intelligence - Assessment of intelligence - IQ constancy - Distribution - uses of intelligence test - Creativity - Creativity and intelligence - Identification and promotion of creativity - Meaning of personality - Factors influencing personality - Assessment of personality - integrated personality - concept of mental health hygiene - conflict and frustration - Unrest - Adjustment - Defence mechanisms - Mental illness - Guidance and counselling.



Unit -7

Meaning of educational innovation - principles involved in innovation - Emergence of school -In cultural, social and religious setting - Innovations that emerged from educational experiments-Tagore:- Santi Niketan- Gandhiji:- Basic Education - A.S.Neill;- Progressive School -Sri Aurobindo :- Ashram Schools. Rousseau: Children's Education - Montessori - Sense Experience - Bertrand Russel- Education for Social Order - Froebel-Kindergarten- Dewey- Pragmatic life J. Krishnamoorthy-Freedom in learning situation. Influence of Psychological factors on innovation - principles underlying self-learning devices. Piaget- Experiment's and discovery learning - Child- centered learning. Effects of cultural, religious and social factors on innovation- Principles of equality - conformity to common educational goals.

Unit -8

Modernization of education - National Educational Policy (1986) - DPEP Special focus on Teacher Education (DTERT, DIETs, BRCs, CRCs) MLL based curriculum and syllabus - Joyful learning - Autonomy in institutional structures - Individual freedom- Library based learning: Self-paced instruction -pace setting schools - Mobile schools- De-Schooling and non-classroom learning - community schools - school complex Distance education and open learning- Education through mass communication - special education -Sainik school - Defence academy - Educational Technology - need for and use of Instructional technology - mass media for instructional purposes - Review of radio and TV educational programmes - educational computing.

Subject: General Knowledge

Marks - 10

Unit-I Indian History

History of India - Vedic period 1526 AD to 1947 - Free India - Modern India

Unit – II Indian Constitution

Origin of Indian Constitution - Salient and special features - Fundamental rights - Legislature - Judiciary Executive - Audit franchise - Human rights.

Unit – III History of Tamil Nadu

Ancient period - Sangam age - Chera, Chola, Pandya's - Economical, political, Social Conditions - Literature Architecture - Fine arts - Geography of Tamil Nadu - Natural boundaries - Resources - Rivers and places.

Unit-IV Personalities Books and authors - Discoveries

Unit-V Sports & Games Confined to India

Unit- VI Abbreviations

Unit – VII Every Day Science

Unit-VIII Current Affairs

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