7. CONCESSIONS

(i) Concessions in the matter of age and/or fees allowed to SCs, SC(A)s, STs, MBCs/DCs, BCs, BCMs, Destitute Widows, Differently Abled Persons, Ex-servicemen, other categories of persons etc., are given in para 12 to 14 of the 'Instructions to Applicants'.

(ii) Persons claiming concession referred to above have to produce evidence for such claim when called for, otherwise their application will be liable for rejection.

Note

In all cases, an Ex-Serviceman once recruited to a post in any class or service or category, **cannot claim the concession** of being called an Ex-Serviceman for his further recruitment. (Proviso to Section 3(j) (vii) of Tamil Nadu Government Servant (Conditions of Service) Act 2016)

8. SCHEME OF EXAMINATION - OBJECTIVE TYPE (OMR METHOD):-

Subject	Duration	Maximum Marks	Minimum Qualifying Marks for selection
Single Paper covering the following subjects:- (200 Questions) (Code No.320) A) Physics B) Chemistry C) Biology (HSC Standard) D) General Studies (SSLC Standard)	3 hours	300	90

Note

(i) The Question Paper will be set in both English and Tamil.

(ii) Refer para 22 of "Instructions to Applicants" in regard to instructions to be followed while appearing for competitive examinations conducted by the Commission.

(iii) The Syllabus for Examination is furnished in the Annexure of this notification.

9. CENTRE FOR EXAMINATION

Examination will be held at the following centres: -

Sl. No.	Name of the Centre	Code	Sl. No.	Name of the Centre	Code
1	Chennai	0100	5	Tirunelveli	2600
2	Madurai	1000	6	Salem	1700
3	Coimbatore	0200	7	Thanjavur	1900
4	Trichirapalli	2500	8	Chidambaram	0302

Note

(i) Applicants will be required to appear for the Written Examination / Certificate Verification at their own expenses.

(ii) The Commission reserves the right to increase/decrease the number of Examination Centres and to re-allot the Applicants.

ANNEXURE
TAMIL NADU PUBLIC SERVICE COMMISSION
(LABORATORY ASSISTANT) – WRITTEN EXAMINATION
OBJECTIVE TYPE
HIGHER SECONDARY STANDARD

SUBJECT CODE: 320

(A) PHYSICS

UNIT – I: ELECTROSTATICS

Frictional electricity, charges and their conservation; Coulomb's law – forces between two point electric charges. Forces between multiple electric charges – Superposition principle

Electric field – Electric field due to a point charge, electric filed lines; Electric dipole, electric filed intensity due to a dipole – behaviour of dipole in a uniform electric field – application of electric dipole in microwave oven.

Electric potential – potential difference – electric potential due to a point charge and due a dipole. Equipotential surfaces – Electrical potential energy of a system of two point charges.

Electric flux – Gauss's theorem and its applications to find field due to (1) infinitely long straight wire (2) uniformly charged infinite plane sheet (3) two parallel sheets and (4) uniformly charged thin spherical shell (inside and outside)

Electrostatic induction – capacitor and capacitance – Dielectric and electric polarisation – parallel plate capacitor with and without dielectric medium – applications of capacitor – energy stored in a capacitor. Capacitors in series and in parallel – action of points – Lightning arrester – Van de Graaff generator.

UNIT –II: CURRENT ELECTRICITY

Electric current – flow of charges in a metallic conductor – Drift velocity and mobility and their relation with electric current.

Ohm's law, electrical resistance. V-I characteristics – Electrical resistivity and conductivity. Classification of materials in terms of conductivity – Superconductivity (elementary ideas) – Carbon resistors – colour code for carbon resistors – Combination of resistors – series and parallel – Temperature dependence of resistance – Internal resistance of a cell – Potential difference and emf of a cell.

Kirchoffs law – illustration by simple circuits – Wheatstone's Bridge and its application for temperature coefficient of resistance measurement – Metrebridge – Special case of Wheatstone bridge – Potentiometer – principle – comparing the emf of two cells.

Electric power – Chemical effect of current – Electro chemical cells Primary (Voltaic, Lechlanche, Daniel) – Secondary – Rechargeable cell – lead acid accumulator.

UNIT- III: EFFECTS OF ELECTRIC CURRENT

Heating effect. Joule's law – Experimental verification. Thermoelectric effects – Seebeck effect – Peltier effect – Thomson effect – Thermocouple, thermoemf, neutral and inversion temperature. Thermopile.

Magnetic effect of electric current – Concept of magnetic field. Oersted's experiment – Biot-Savart law – Magnetic field due to an infinitely long current carrying straight wire and circular coil – Tangent galvanometer – Construction and working – Bar magnet as an equivalent solenoid – magnetic field lines.

Amper's circuital law and its application.

Force on a moving charge in uniform magnetic field and electric field – cyclotron – Force on current carrying conductor in a uniform magnetic field, forces between two parallel current carrying conductors – definition of ampere.
Torque experienced by a current loop in a uniform magnetic field-moving coil galvanometer – Conversion to ammeter and voltmeter – Current loop as a magnetic dipole and its magnetic dipole moment – Magnetic dipole moment of a revolving electron.

UNIT-IV: ELECTROMAGNETIC INDUCTION AND ALTERNATING CURRENT

Electromagnetic induction – Faradys's law – induced emf and current – Lenz's law.
Self induction – Mutual induction – Self inductance of a long solenoid – mutual inductance of two long solenoids.
Methods of inducting emf – (1) by changing magnetic induction (2) by changing area enclosed by the coil and (3) by changing the orientation of the coil (quantitative treatment) analytical treatment can also be included.
AC generator – commercial generator. (Single phase, three phase).
Eddy current – Applications – Transformer – Long distance transmission.
Alternating current – measurement of AC – AC circuit with resistance – AC circuit with inductor – AC circuit with capacitor – LCR series circuit – Resonance and Q – factor: power in AC circuits.

UNIT – V: ELECTROMAGNETIC WAVES AND WAVE OPTICS

Electromagnetic waves and their characteristics – Electromagnetic spectrum, Radio, Microwaves, Infra red, visible, ultra violet – X rays, gamma rays.
Emission and absorption spectrum – Line, Band and continuous spectra – Flourescence and phosphorescence.
Theories of light – Corpuscular – Wave – Electromagnetic and Quantum theories.
Scattering of light – Rayleigh's scattering – Tyndal Scattering – Raman effect – Raman spectrum – Blue colour of the sky and reddish appearance of the sun at sunrise and sunset.
Wavefront and Huygen's principle – Reflection, Total internal reflection and refraction of plane wave at a plane surface using wavefronts.
Interference – Young's double slit experiment and expression for fringe width – coherent source – interference of light. Formation of colours in thin films – analytical treatment – Newton's rings.
Diffraction – differences between interference and diffraction of light – diffraction grating.
Polarisation of light waves – polarisation by reflection – Brewster's law double refraction – nicol prism – uses of plane polarised light and polaroids – rotatory polarisation – polarimeter.

UNIT – VI: ATOMIC PHYSICS

Atomic structure – discovery of the electron – specific charge (Thomson's method) and charge of the electron (Millikan's oil drop method) – alpha scattering – Rutherford's atom model.
Bohr's model – energy quantisation – energy and wave number expression – Hydrogen spectrum – energy level diagrams – sodium and mercury spectra – excitation and ionization potentials. Sommerfeld's atom model.
X-rays – production, properties, detection, absorption, diffraction of X-rays – Laue's experiment – Bragg's law, Bragg's X-ray spectrometer – X-ray spectra – continuous and characteristic X-ray spectrum – Mosley's law and atomic number.

Masers and Lasers – spontaneous and stimulated emission – normal population and population inversion – Ruby laser, He-Ne laser – properties and applications of laser light – holography.

UNIT – VII: DUAL NATURE OF RADIATION AND MATTER – RELATIVITY

Photoelectric effect – Light waves and photons – Einstein's photo – electric equation – laws of photo – electric emission – particle nature of energy – photoelectric equation – work function – photo cells and their application.
Matter waves – wave mechanical concept of the atom – wave nature of particles – De-Broglie relation – De-Broglie wave length of an electron – electron microscope.
Concept of space, mass, time – Frame of references. Special theory of relativity – Relativity of length, time and mass with velocity ($E=mc^2$).

UNIT – VIII: NUCLEAR PHYSICS

Nuclear properties – nuclear Radii, masses, binding energy, density, charge – isotopes, isobars and isotones – Nuclear mass defect – binding energy. Stability of nuclei – Bain bridge mass spectrometer.
Nature of nuclear forces – Neutron – discovery – properties – artificial transmutation – particle accelerator.
Radioactivity – alpha, beta and gamma radiations and their properties, α-decay and β-decay and ϒ-decay – Radioactive decay law – half life – mean life. Artificial radioactivity – radio isotopes – effects and uses Geiger – Muller counter.
Radio carbon dating – biological radiation hazards.
Nuclear fission – chain reaction – atom bomb – nuclear reactor – nuclear fusion – Hydrogen bomb – cosmic rays – elementary particles.

UNIT –IX: SEMICONDUCTOR DEVICES AND THEIR APPLICATIONS

Semiconductor theory – energy band in solids – difference between metals, insulators and semiconductors based on band theory – semiconductor doping – Intrinsic and Extrinsic semi conductors.
Formation of P-N Junction – Barrier potential and depletion layer – P-N Junction diode – Forward and reverse bias characteristics – diode as a rectifier – zener diode. Zener diode as a voltage regulator – LED.
Junction transistors – characteristics – transistor as a switch – transistor as an amplifier – transistor biasing – RC, LC coupled and direct coupling in amplifier – feeback amplifier –positive and negative feedback – advantages of negative feedback amplifier – oscillator condition for oscillations – LC circuit – Colpitt oscillator.
Logic gates – NOT, OR, AND, EXOR using discret components – NAND and NOR gates as universal gates – integrated circuits.
Laws and theorems of Boolean's algebra – operational amplifier – parameters – pin-out configuration – Basic applications. Inverting amplifier. Non-inverting amplifier - summing and difference amplifiers.
Measuring Instruments – Cathode Ray oscilloscope – Principle – Functional units – uses. Multimeter – construction and uses.

UNIT – X: COMMUNICATION SYSTEMS

Modes of propagation, ground wave – sky wave propagation.
Amplitude modulation, merits and demerits – applications – frequency modulation – advantages and applications – phase modulation.
Antennas and directivity.
Radio transmission and reception – AM and FM – superheterodyne receiver.
T.V. transmission and reception – scanning and synchronising.

Vidicon (Camera tube) and picture tube – block diagram of a monochrome TV transmitter and receiver circuits.
Radar – principle – applications.
Digital communication – data transmission and reception – principles of fax, modem, Satellite communication – wire, cable and Fibre – optical communication.

(B) CHEMISTRY

I - INORGANIC CHEMISTRY

UNIT - I: ATOMIC STRUCTURE-II

Dual properties of electrons - de-Broglie relation – Heisenberg's uncertainty principle – Wave nature of an electron – Schrodinger wave equation (only equation, no derivation) – Eigen values and Eigen function – significance only – molecular orbital method. Application to Homo diatomic and Hetero diatomic molecules – Metallic Bond – Hybridization of atomic orbital's Hybridization involving s, p and d Orbital's – Types of forces between molecules.

UNIT- II: PERIODIC CLASSIFICATION-II

Review of periodic properties – Calculation of atomic radii – Calculation of ionic radii – Method of determination of Ionisation potential – Factors affecting ionisation potential – Method to determine the electron affinity – Factors affecting EA – Various scales on electro negativity values.

UNIT- III: p- BLOCK ELEMENTS – II

Group-13 General trends – Potash alum – Preparation, Properties and uses – Group-14 General trends – Silicates – Types and structure – Silicones – Structure and uses – Extraction of lead – Group-15 General trends – Phosphorous – Allotropes and extraction – Compounds of phosphorous – Group-16 General trends – H_2SO_4 – Manufacture and properties – Group-17 General characteristics. Physical and Chemical properties – Isolation of fluorine and its properties – Interhalogen compounds Group 18 Inert gases – Isolation, properties and uses.

UNIT- IV: d- BLOCK ELEMENTS

General characteristics of d-block elements – First transition series – Occurrence and principles of extraction – chromium, copper and zinc – Alloys – Second transition series – Occurrence and principles of extraction of silver – Third transition series – Compounds – $K_2Cr_2O_7$, $CuSO_4.5H_2O$, $AgNO_3$, Hg_2Cl_2, $ZnCO_3$, Purple of cassius.

UNIT-V: f- BLOCK ELEMENTS

General characteristics of f-block elements and extraction – Comparison of Lanthanides and Actinides – Uses of lanthanides and actinides.

UNIT-VI: COORDINATION COMPOUNDS AND BIO-COORDINATION COMPOUNDS

An introduction – Terminology in coordination chemistry – IUPAC nomenclature of mononuclear coordination compounds – Isomerism in coordination compounds – Structural isomerism – Geometrical isomerism in 4-coordinate, 6-coordinate complexes – Theories on coordination compounds – Werner's theory (brief) – Valence Bond theory – Crystal field theory – Uses of coordination compounds – Bio-coordination compounds. Haemoglobin and chlorophyll.

UNIT - VII: NUCLEAR CHEMISTRY

Nuclear energy, nuclear fission and fusion – Radio carbon dating – Nuclear reaction in sun – Uses of radioactive isotopes.

II.PHYSICAL CHEMISTRY

UNIT-VIII: SOLID STATE II

Types of packing in crystals – X-Ray crystal structure – Types of ionic crystals – Imperfections in solids – Properties of crystalline solids – Amorphous solid.

UNIT- IX:THERMODYNAMICS – II

Review of first law – Need for the second law of thermodynamics – Spontaneous and non spontaneous processes – Entropy – Gibb's free energy – Free energy change and chemical equilibrium – Third law of thermodynamics.

UNIT-X: CHEMICAL EQUILIBRIUM II

Applications of law of mass action – Le Chatlier's principle.

UNIT-XI: CHEMICAL KINETICS –II

First order reaction and pseudo first order reaction – Experimental determination of first order reaction – method of determining order of reaction – temperature dependence of rate constant – Simple and complex reactions.

UNIT-XII – SURFACE CHEMISTRY

Adsorption – Catalysis – Theory of catalysis – Colloids – Preparation of colloids – Properties of colloids – Emulsions.

UNIT-XIII – ELECTROCHEMISTRY – I

Conductors, insulators and semi conductors – Theory of electrical conductance – Theory of strong electrolytes – Faraday's laws of electrolysis – Specific resistance,

specific conductance, equivalent and molar conductance – Variation of conductance with dilution – Kohlraush's law – Ionic product of water, pH and pOH – Buffer solutions – Use of pH values.

UNIT-XIV – ELECTROCHEMISTRY – II

Cells – Electrodes and electrode potentials – Construction of cell and EMF – Corrosion and its preventions – commercial production of chemicals – Fuel cells.

III. ORGANIC CHEMISTRY

UNIT-XV: ISOMERISM IN ORGANIC CHEMISTRY

Geometrical isomerism – Conformations of cyclic compounds – Optical isomerism – Optical activity – Chirality – Compounds containing chiral centres – D-L and R-S notation – Isomerism in benzene.

UNIT- XVI: HYDROXY DERIVATIVES

Nomenclature of alcohols – Classification of alcohols – General methods of preparation of primary alcohols – Properties Methods of distinction between three classes of alcohols 1^{o},2^{o} and 3^{o} – Methods of preparation of dihydric alcohols(glycol) – Properties – Uses – Methods of preparation of trihydric alcohols – Properties – Uses – Aromatic alcohols - Methods of preparation of benzyl alcohol – Properties – Uses – Phenols – Manufacture of phenols – Properties – Chemical properties – Uses of Phenols.

UNIT- XVII: ETHERS

Ethers – General methods of preparation of aliphatic ethers – Properties – Uses – Aromatic ethers – Preparation of anisole – Reactions of anisole – Uses.

UNIT- XVIII: CARBONYL COMPOUNDS

Nomenclature of carbonyl compounds – Comparison of aldehydes and ketones – General methods of preparation of aldehydes – Properties – Uses – Aromatic aldehydes – Preparation of benzaldehyde – Properties – Uses – Ketones – General Methods of preparation of aliphatic ketones (acetone) – Properties – Uses – Aromatic ketones – Preparation of acetophenone – Properties – Uses – Preparation of benzophenone – Properties.

UNIT- XIX: CARBOXYLIC ACIDS

Nomenclature – Preparation of aliphatic monocarboxylic acids –formic acid – Properties – Uses – Tests for carboxylic acid – Monohydroxy mono carboxylic acids – Lactic acid – Sources – Synthesis of lactic acid – Aliphatic dicarboxylic acids – Preparation of dicarboxylic acids – oxalic and succinic acids – Properties – Strengths of carboxylic acids – Aromatic acids – Preparation of benzoic acid – Properties –

Uses – Preparation of salicylic acid – Properties – Uses – Derivatives of carboxylic acids – Preparation of acid chloride – acetyl chloride (CH_3COCI) – Preparation – Properties – Uses – Preparation of acetamide – Properties – Preparation of acetic anhydride – Properties – Preparation of esters – methyl acetate – Properties.

UNIT-XX – ORGANIC NITROGEN COMPOUNDS

Aliphatic nitro compounds – Preparation of aliphatic nitroalkanes – Properties – Uses – Aromatic nitro compounds – Preparation – Properties – Uses – Distinction between aliphatic and aromatic nitro compounds – Amines – Aliphatic amines – General methods of preparation – Properties – Distinction between 1^o,2^o and 3^o amines – Aromatic amines – Synthesis of benzylamine – Properties – Aniline – Preparation – Properties – Uses – Distinction between aliphatic and aromatic amines – Aliphatic nitriles – Preparation – Properties – Uses – Diazonium salts – Preparation of benzene diazoniumchloride – Properties.

UNIT-XXI – BIOMOLECULES

Carbohydrates – Structural elucidation – Disaccharides and polysaccharides – Proteins – Amino acids – Structure of Proteins – Nucleic acids – Lipids.

UNIT- XXII :CHEMISTRY IN ACTION

Medicinal Chemistry – Drug abuse – Dyes – Classification and uses – Cosmetics – creams perfumes, talcum powder and deodorants – Chemicals in food – Preservatives artificial sweetening agents, antioxidants and edible colours – Insect repellent – Pheromones and sex attractants – Rocket fuels – Types of polymers, preparation and uses.

(C) BIOLOGY

I. BOTANY

UNIT – I: TAXONOMY OF ANGIOSPERMS

Types of classifications – artificial – natural – phylogenetic. Biosystematics – bionomial nomenclature – herbarium and its uses. Bentham and Hooker's classification of plants – families – Malvaceae - Solanaceae – Euphorbiaceae – Musaceae and their Economic importance.

UNIT – II: PLANT ANATOMY

Tissue and tissue systems – anatomy of monocot and dicot roots – anatomy of monocot and dicot stems – anatomy of dicot leaf.

UNIT – III: CELL BIOLOGY AND GENETICS

Chromosomes – structure and types – genes and genomes – linkage and crossing over – gene mapping – recombination of chromosomes – mutation – chromosomal aberrations – DNA as genetic material - structure of DNA – replication of DNA - structure of RNA and its types.

UNIT – IV: BIOTECHNOLOGY

Recombinant DNA technology – transgenic plants and microbes – plant tissue culture and its application – protoplasmic fusion – single cell protein.

UNIT – V: PLANT PHYSIOLOGY

Photosynthesis – significance – site of photosynthesis – photochemical and biosynthetic phases – electron transport system – cyclic and non-cyclic photophosphorylation – C3 and C4 pathways – photorespiration – factors affecting photosynthesis – mode of nutrition – autotrophic – heterotrophic – saprophytic – parasitic and insectivorous plants – chemosynthesis – respiration – mechanism of glycolysis – Krebs cycle – pentose phosphate pathway – anaerobic respiration – respiratory quotient – compensation point – fermentation. Plant growth – growth regulators – phytohormones – auxins – gibberellins – cytokinins – ethylene and abscisic acid. Photoperiodism and vernalization.

UNIT – VI BIOLOGY IN HUMAN WELFARE

Food production – breeding experiments – improved varities and role of biofertilizers. Crop diseases and their control – biopesticides – genetically modified food – biowar – biopiracy – biopatent – sustained agriculture and medicinal plants including microbes. Economic importance – food yielding (rice) – oil yielding (groundnut) – fibre yielding (cotton) and timber yielding (teak) plants.

II. ZOOLOGY

UNIT – I : HUMAN PHYSIOLOGY

Nutrition : Introduction – Carbohydrates – Proteins – Lipids – Vitamins – Minerals – Water – Balanced diet _ Calorie values (ICMR standards) – Obesity – Hyperglycemia – hypoglycaemia – Malnutritions.

Digestion : Enzyme and enzyme action – Brief account of following – Dental caries – Root canal therapy – Peptic ulcer – Hernia – Appendicitis – Gall bladder stone – Liver cirrhosis – Hepatitis.

Bones and joints (Major types) : Fractures – Dislocations – Arthritis – Rickets and osteomalacia – orthopaedics – Gout.

Muscles : Muscle action – Muscle tone – Rigor mortis – Muscle pull (hernia) – Isometric and aerobic exercises (Body building) – Myasthenia gravis.

Respiration : Process of pulmonary respiration – Inspiration – Expiration – Exchange of gases at alveolar level – Control of respiration – Pnuemonia – Pleurisy – Tuberculosis – Bronchitis – Breathing exercises.

Circulation – Functioning of heart – Origin and conduction of heart beat. Artificial pacemaker – Coronary blood vessel and its significance – Myocardial infarction, Angina pectoris – Angiogram, angioplasty and coronary bypass surgery – Atherosclerosis – Heart attack – Heart block – ECG and Echocardiograph – Heart valves – Rheumatic Heart Disease (RHD) – ICCU – Arterial and venous systems – Blood pressure - pulse rate – Heart transplantation Resuscitation in heart attack (First Aid) – Blood components Function – Plasma – Corpuscles – Blood clotting – Anticoagulants – Thrombosis – Embolism – blood related diseases like polycythemia, Leukemia – Lymph fluid.

Physiological - Co-ordination systems – Brain – Functioning of different regions – Memory – Sleep – Stroke – Alzhemier's disease – Meningitis/Brain fever conditioned reflex – Electroencephalography – Right brain – Left brain concept – Spinal cord – Functioning – Reflex action – CSF – Chemical co-ordination – Pituitary (Hormones of Adenohypophysis and their regulations) – Thyroid, Parathyroidal hormones – Insulin

and Glucagon – Hormones of Adrenal cortex and Medulla – Reproductive Hormones – Problems related to Secretion, Non secretion of Hormones.
Receptor Organs – Eye – Focussing Mechanism & photo chemistry of retina – Shortsightedness – Longsightedness – Optometry – Retinopathy – Cataract – Lens replacement – Nyctalopia – Eye infection – Conjunctivitis – Glaucuoma – Eye care – EAR – Hearing mechanism – Organ of corti – Hearing impairments and aids – Noise pollution and its importance – SKIN – Melanin – functions – Effect of solar radiations/UV – Skin grafting – Dematitis – TONGUE – Gustatory reception.
Excretion – Ureotelism – Urea Biosynthesis (Ornithine Cycle) – Nephron ultrafiltration, tubular reabsorption and tubular secretion – Renal failure – Dialysis Kidney stone formation – Kidney Transplantation – Diabetes.
Reproductive system – Brief account of spermatogenesis – Oogenesis Menstrual cycle – Invitro fertilization – Birth control.

UNIT – II : MICROBIOLOGY

Introduction – History of Medical Microbiology – The influence of Pasteur Koch, and Lister virology, Structure, Genetics, Culture and diseases – AIDS and its control – Bacteriology – Structure, Genetics and diseases – Protozoan microbiology – Disease oriented – Pathogenecity of Micro organism – Anti microbial resistance Chemotherapy.

UNIT – III : IMMUNOLOGY

Innate (Non-specific) Immunity – Anatomical barriers – Physiological barriers – Phagocytic barriers – Lymphoidal organs – Thymus – Bursa of Fabricius – Peripheral Lymphoid Organs – Lymph nodes – Spleen – Antibodies – Immunoglobulins – Regions of polypeptide chain – Transplantation immunology – Classification of grafts – Genetic basis of organ transplants – Immune system disorder.

UNIT – IV : MODERN GENETICS

Introduction – Scope – Human Genetics karyotyping Chromosome gene mapping, Recombinant DNA technology and segmenting.
Genetic Disease – Human Genome project – Cloning – Transgenic organisms Genetically modified organisms (GMO) – Gene therapy – Bio informatics application – DNA sequencing and protein structure. Biological database.

UNIT – V : ENVIRONMENTAL SCIENCE

Human population and explosion – Issue – Global warming Crisis – Green House Effect – Ozone layer depletion – Waste management – Biodiversity conservation (Biosphere reserves) Governmental and Non Governmental organizations involved – Energy crisis and Environmental impact – Poverty and environment Fresh water crisis and management.

UNIT – VI: APPLIED BIOLOGY

Livestock and management – Dairy – Breeds of Cattle – Milch breed – Draught breed - Dual purpose – Common disease and control – Exotic and cross breeds – Techniques adopted in cattle breeding.
Poultry – Farming techniques – Breeds – Farming methods – Poultry diseases – Economic value.
Pisciculture Fish farming – Edible fishes of Tamilnadu.
Medical Lab Techniques – Stethoscope – Sphygmomanometer – Heamocytometer – Urine – Sugar analysis – ECG – 'PQRST' wave – CT scan – Endoscopic (Laproscopic) techniques – Artificial pacemaker – Auto analyser.

UNIT – VII: THEORIES OF EVOLUTION

Lamarckism – Neolamarckism – Darwinism – NeoDarwinism/Modern concept of natural selection – Species concept – Origin of species and Isolating Mechanisms.

UNIT – VIII: AQUACULTURE

History- Prospects- Kinds- Pond structure- Bunds- Pond types- Location- Culture-Physics- Chemical factors- Food- Bionomics of cultivable fishes and fresh- water prawns- Induced breeding- Diseases parasites and control- Ornamental fishes-Culture- Feeding- Mari culture.

(D) GENERAL STUDIES (SSLC STANDARD)

UNIT-I GENERAL SCIENCE:

Physics: Nature of Universe-General Scientific laws-Inventions and discoveries-National scientific laboratories-Mechanics and properties of matter-Physical quantities, standards and units-Force, motion and energy-Magnetism, electricity and electronics -Heat, light and sound
Chemistry-Elements and Compounds-Acids, bases and salts-Fertilizers, pesticides, insecticides
Botany-Main Concepts of life science-Classification of living organism-Nutrition and dietetics-Respiration
Zoology-Blood and blood circulation-Reproductive system-Environment, ecology, health and hygiene-Human diseases including communicable and non – communicable diseases - prevention and remedies-Animals, plants and human life

UNIT-II. CURRENT EVENTS

History-Latest diary of events-national -National symbols-Profile of States-Eminent persons & places in news-Sports & games-Books & authors -Awards & honors'-India and its neighbors
Political Science-1. Problems in conduct of public elections-2. Political parties and political system in India-3. Public awareness & General administration-4. Welfare oriented govt. schemes, their utility
Geography--Geographical landmarks-
Economics-- Current socio-economic problems
Science-Latest inventions on science & technology

UNIT- III. GEOGRAPHY

Earth and Universe-Solar system-Monsoon, rainfall, weather & climate-Water resources --- rivers in India-Soil, minerals & natural resources-Forest & wildlife-Agricultural pattern-Transport including surface transport & communication-Social geography – population-density and distribution-Natural calamities – Disaster Management.

UNIT - IV. HISTORY AND CULTURE OF INDIA AND TAMIL NADU

Indus valley civilization-Guptas, Delhi Sultans, Mughals and Marathas-Age of Vijayanagaram and the bahmanis-South Indian history-Culture and Heritage of Tamil people-India since independence-Characteristics of Indian culture-Unity in diversity –race, colour, language, custom-India-as secular state-Growth of rationalist, Dravidian movement in TN-Political parties and populist schemes

UNIT-V. INDIAN POLITY

Constitution of India--Preamble to the constitution- Salient features of constitution- Union, state and territory- Citizenship-rights amend duties- Fundamental rights- Fundamental duties- Human rights charter- Union legislature – Parliament- State executive- State Legislature – assembly- Local government – panchayat raj – Tamil Nadu- Judiciary in India – Rule of law/Due process of law-Elections- Official language and Schedule-VIII- Corruption in public life- Anti-corruption measures –CVC, lok-adalats, Ombudsman, CAG - Right to information- Empowerment of women- Consumer protection forms.

UNIT-VI. INDIAN ECONOMY

Nature of Indian economy- Five-year plan models-an assessment-Land reforms & agriculture-Application of science in agriculture-Industrial growth-Rural welfare oriented programmers-Social sector problems – population, education, health, employment, poverty-Economic trends in Tamil Nadu

UNIT-VII. INDIAN NATIONAL MOVEMENT

National renaissance-Emergence of national leaders-Gandhi, Nehru, Tagore-Different modes of agitations-Role of Tamil Nadu in freedom struggle Rajaji, VOC, Periyar, Bharathiar & others.

UNIT-VIII. APTITUDE & MENTAL ABILITY TESTS

Conversion of information to data-Collection, compilation and presentation of data - Tables, graphs, diagrams -Analytical interpretation of data - Simplification-Percentage-Highest Common Factor (HCF)-Lowest Common Multiple (LCM)-Ratio and Proportion-Simple interest-Compound interest-Area-Volume-Time and Work-Logical Reasoning-Puzzles-Dice-Visual Reasoning-Alpha numeric Reasoning-Number Series.
