



TAMIL NADU PUBLIC SERVICE COMMISSION

Advertisement No. 488
Notification No. 02/2018

DATED: 25.01.2018

Applications are invited only through online mode up to 21.02.2018 for Direct Recruitment to the following post:-

It is mandatory for the applicants to register their basic particulars through One Time online Registration system on payment of Rs.150/- (Rupees One Hundred and Fifty only) towards registration fee and then should apply online for this recruitment. [The One-Time Registration will be valid for 5 years from the date of registration. Thereafter, the registration should be renewed by paying the prescribed fee.]

Name of the Post and Code No.	Name of the Service and Code No.	No. of vacancies	Scale of Pay
Laboratory Assistant in Forensic Science Department 2016-2018 (Code No. 3103)	Tamil Nadu Forensic Science Subordinate Service (Code No.033)	56	Level - 8 Rs.19,500- 62,000 /-

2. DISTRIBUTION OF VACANCIES

The rule of reservation of appointments is applicable for this recruitment and the Distribution of vacancies will be announced later after receipt of orders from the Government regarding identification of suitable categories of Differently Abled Persons towards 4% reservation for this post.

3. IMPORTANT DATES AND TIME

Date of Notification	25.01.2018	
Last date for submission of application	21.02.2018	
Last date for payment of Fee through Bank(State Bank of India or Indian Bank)	23.02.2018	
Date and Time of Written Examination	06.05.2018 FN	10.00 A.M. to 01.00 P.M

4. FEES

a)	<p>Registration Fee</p> <p>For One Time Registration (Revised with effect from 01.03.2017 vide G.O.(Ms).No. 32, Personnel and Administrative Reforms Department, dated 01.03.2017)</p> <p>Note</p> <p>(i) Applicants who have already registered in one time Registration system paying Rs.50/- before 01.03.2017 and those who have registered for One-Time Registration on or after 01.03.2017 by paying Rs.150/- are exempted from paying the registration fee for this recruitment.</p>	Rs.150/-
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	(ii) Applicants who have made One-Time Registration must pay the prescribed examination fee for this recruitment unless fee exemption is claimed. (One-Time Registration is only to avail exemption for Registration fee for a period of 5 years from the date of registration and it will not be considered as prescribed examination fee for this recruitment).	
b)	<u>Examination Fee</u> <u>Note</u> The Examination fee should be paid at the time of submitting the online application for this recruitment, if they are not eligible for the fee concession noted below :-	Rs.100/-

EXAMINATION FEE CONCESSION

Category	Concession	Condition
(i) Scheduled Castes / Scheduled Caste (Arunthathiyars), Scheduled Tribes	Full Exemption	--
(ii) Differently Abled Persons, Destitute Widow of all communities	Full Exemption	(i) For Differently Abled persons, the disability should be not less than 40%. (ii) For DWs, the DW certificate should have been obtained from the RDO / Sub Collector/ Assistant Collector
(iii) Most Backward Class / Denotified Communities, Backward Classes (Other than Muslim) Backward Class (Muslim)	Those who have not availed three free chances so far in the previous recruitments may avail exemption from payment of examination fee.	Should not have availed three free chances in the previous recruitments.
(iv) Ex-Servicemen	Those who have not availed two free chances so far in the previous recruitments may avail exemption from payment of examination fee.	(i) Should not have availed two free chances in the previous recruitments. (ii) Fee concession will not apply to those who have already been recruited to any class or service or category.

Note

- (i) The three / two free chances referred to above are not for **EACH POST** but for **ANY THREE / TWO APPLICATIONS ONLY**. The claim for exemption from payment of examination fee made in any application which is rejected / admitted or withdrawn will be counted as a free chance availed.
- (ii) Failure to pay the prescribed fee along with the application in-time will be liable for rejection of application.
- (iii) The number of free chances availed by the applicant means the total number of free chances hitherto availed by the applicant in his / her earlier application submitted to the Commission for any post / recruitment.

- (iv) If the examination fee concession claimed in the applications is found to exceed the admissible limits as announced above, the application will be rejected at any stage of selection. The number of free chances availed by the applicants will be counted from the previous applications submitted through One Time Registration and / or submitted directly without One-Time Registration i.e., before One Time Registration was made as mandatory.

5. MODE OF PAYMENT OF EXAMINATION FEE

- Examination fee of Rs.100/- (Rupees One Hundred only) is payable online through Net banking / Credit card / Debit card or it can be paid offline at SBI / at Indian Bank within 2 days from the date of submission of online application, by choosing the option in the online application.
- Applicants have to register their basic particulars through One -Time Registration which is mandatory on payment of Rs.150/- (Rupees One Hundred and Fifty only) towards registration fee and then should apply online for this recruitment. The One Time Registration will be valid for 5 years from the Date of Registration. Thereafter, the registration should be renewed by paying the prescribed fee. Applicants who have already registered in One Time Registration system on payment of Rs.50/- before 01.03.2017 and those who have registered for One Time Registration on or after 01.03.2017 by paying Rs.150/- towards One Time Registration are exempted from paying the registration fee for this recruitment.
- Applicants have also to pay the service charges applicable to the State Bank of India / Indian Bank.
- Applicants can avail exemption from paying examination fees as per eligibility criteria.
- Offline mode of payment in the form of Demand Draft / Postal Order etc., will not be accepted and the applications forwarded with such modes of payment will be summarily rejected.

(For further details regarding the Examination fee concession, refer [para 2 \(13 – 23\)](#) of “[Instructions to Applicants](#)”).

6. QUALIFICATIONS

(A) AGE LIMIT (as on 01.07.2018)

Name of the post	Category of Applicants	Minimum Age (Should have completed)	Maximum Age
Laboratory Assistant	SCs, SC(A)s, STs, MBCs/DCs, BCs, BCMs and DWs of all Castes	Minimum 18 years	No Maximum Age limit
	“Others” [i.e. Applicants not belonging to SCs, SC(A)s, STs, MBCs/DCs, BCs and BCMs]		30 Years (Should not have completed)

Age Concession

(i) For Differently Abled Persons:

- (a) “Others” [i.e. Applicants not belonging to SCs, SC (A)s, STs, MBCs/DCs, BCs and BCMs] are eligible for age concession upto 10 years over and above the maximum age limit prescribed above.

For Ex-servicemen

- (a) The maximum age limit is 48 years for “others” [i.e. Applicants not belonging to SCs, SC (A)s, STs, MBCs/DCs, BCs and BCMs].
- (b) The above mentioned age concession will not apply to those Applicants who have already been recruited to any class or service or category.

Note

- (i) “Others” [i.e., Applicants not belonging to SCs, SC(A)s, STs, MBCs/DCs, BCs and BCMs] who have put in 5 years and more of service in the State / Central Government are not eligible to apply even if they are within the age limit.
- (ii) Instructions given with regard to maximum age limit under para 5 of the 'Instructions to Applicants' will apply to this recruitment.

(B) EDUCATIONAL QUALIFICATION: (as on 25.01.2018)

Applicants should possess the following qualification:-

Educational Qualification:-

A Pass in Higher Secondary Examination with Physics, Chemistry and Biology / Botany & Zoology as subjects.

Note

- (i) The qualification prescribed for this post should have been obtained by passing the required qualification in the order of studies viz. 10th + HSC. The results of exam should have been declared on or before the date of Notification.
- (ii) Applicants claiming equivalence of qualification to the prescribed qualification should upload and submit evidence for equivalence of qualification in the form of G.O. issued prior to the date of this notification when called for, failing which, their application will be summarily rejected. The G.Os declaring regarding equivalence of qualification issued after the date of this notification will not be accepted for this recruitment [Section 25(b) of Tamil Nadu Government Servant (Conditions of service) Act 14/2016].
(Refer [para 10 of the “Instructions to Applicants “](#))

(C) CERTIFICATE OF PHYSICAL FITNESS

Applicants selected for appointment to the above said post will be required to produce a certificate of physical fitness in the form prescribed below before their appointment:

Name of the Post	Standard of Vision Prescribed	Form of Certificate of Physical Fitness
Laboratory Assistant	Standard III or Better	other than Executive and Ministerial

* Colour Blindness will be a disqualification.

(D) KNOWLEDGE IN TAMIL

Applicants should possess adequate knowledge in Tamil on the date of this Notification.

(For details refer [para 11 of the Commission's 'Instructions to Applicants'](#)).

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 D) General Studies (SSLC Standard) } (HSC 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.

10. SELECTION PROCEDURE

Based on the marks obtained by the candidates in the Written Examination, the tentative list of eligible candidates for certificate verification will be announced in the Commission's website. After verification of the original certificates, the eligible candidates will be summoned for counselling following rule of reservation of appointments.

11. NO OBJECTION CERTIFICATE / INFORMATION TO THE EMPLOYER

No Objection Certificate obtained from appropriate authority shall be produced at the time of Certificate Verification, failing which, the application will be rejected.

For details refer [para 15 \(g\) of Commission's 'Instructions to Applicants'](#). - Any violation of this instruction will be liable for / end in rejection of application and forfeiture of his/her candidature.

12. GENERAL INFORMATION

- A. The rule of reservation of appointments is applicable to this recruitment. The distribution of vacancies will be as per rules in force.
- B. In G.O.Ms.No.145, Personnel and Administrative Reforms(S) Department dated 30.09.2010 and G.O.Ms.No.40, Personnel and Administrative Reforms(S) Department dated 30.04.2014, the Government have issued orders to fill up 20% of vacancies in direct recruitment on preferential basis to Persons who studied the prescribed qualification in Tamil Medium. The 20% reservation of vacancies on preferential allotment to **Persons Studied in Tamil Medium (PSTM)** will apply for this recruitment. Applicants claiming PSTM preference must produce certificate issued by Head of Institution as proof as per the specimen contained in the "Instructions to Applicants" for having studied the prescribed qualification in Tamil Medium. (Having written the examination in Tamil language alone will not qualify for claiming this preference). If the Applicants with PSTM certificate are not available for selection for appointment against reserved turn, such turn shall be filled up by other eligible Applicants but belonging to the respective communal category. The PSTM certificate, in prescribed format / pro forma available in the Commission's website at 'www.tnpsc.gov.in' shall be obtained from the Head of the Institution and shall be produced / uploaded when called for.(For further details refer Instructions to Applicants).
- C. **The number of vacancies advertised is only approximate and is liable to modification with reference to vacancy position at any time including reduction before finalization of selection.**
- D. The selection for appointment to the above said post is purely provisional subject to final Orders on pending Writ Petitions, if any, filed at Madras High Court and Madurai Bench of Madras High Court.
- E. As per Section 26 and 27(c) of Tamil Nadu Government Servants (Conditions of Service) Act, 2016, Reservation of appointment to **Destitute Widows and Ex-Serviceman** respectively **will apply** to this recruitment.
- F. If the post is identified as suitable for Differently Abled persons of any category, the reservation of 4% for Differently Abled persons as per G.O.Ms. No. 21, Welfare of Differently Abled Persons (DAP3.2) Department, dated 30.05.2017 will be made applicable. Hence, the Differently Abled persons may apply to this recruitment. Their application will be accepted subject to the orders to be issued by the Government.
- G. The Differently Abled persons should submit copy of Differently Abled Certificate specifying the nature of physical handicap and the degree of disability when called for by the Tamil Nadu Public Service Commission.

- H. If no qualified and suitable women applicants are available for selection against the vacancies reserved for them, those vacancies will be filled by male applicants belonging to the respective communal categories.
- I. Even after filling up of the vacancies reserved for SC Arunthathiyars on preferential basis, if more number of qualified Arunthathiyars are available, they shall be entitled to compete with the Scheduled Castes other than Arunthathiyars in the inter-se merit among them and if any post reserved for Arunthathiyars remain unfilled for want of adequate number of qualified Applicants, it shall be filled up by Scheduled Castes other than Arunthathiyars.
- J. Any subsequent claim made thereafter on submission of online application will not be entertained. Evidence for claims made in the online application should be uploaded / submitted in time when called for the documents. Failure to submit the documents within the stipulated time limit **will entail rejection of the Application**.
- K. Correct and True information regarding arrest, convictions / debarment / disqualification by any recruiting agency, criminal or any disciplinary proceedings initiated / pending or finalized, participation in agitation or any Political Organization, candidature in election for Parliament/State Legislature/Local Bodies etc., if any, should also be furnished to the Commission at the time of application i.e., the details thereof, originals of the Judgement, order or G.O dropping further action in Departmental proceedings or any document that may prove the suitability of such Applicants for a Government appointment in such cases must be produced at the stage / time of Certificate Verification without fail.
- L. **Incomplete applications and applications containing wrong claims or incorrect particulars relating to category of reservation / other basic qualification / eligibility wise/ age / communal categories / educational qualification / physical qualification and other basic eligibility criteria will be liable for rejection.**
- M. **One Time Registration is not an application for any Post/Recruitment. Though the details/particulars were furnished in the One Time Registration by the applicants, the details/particulars furnished in the online application submitted for this recruitment alone will be taken into consideration. Tamil Nadu Public Service Commission will not be responsible for any consequences arising out of furnishing of incorrect and incomplete details in the application or omission to provide the required details in the application for this recruitment.**

13. OTHER IMPORTANT INSTRUCTIONS

- a) **Applicants should ensure their eligibility for examination:** The applicants applying for the examination should go through all instructions carefully and ensure that they fulfil all eligibility conditions for admission to examination. **Their admission to all stages of the examination will be purely provisional subject to satisfaction of the eligibility conditions.** Mere issue of memo of admission to the applicant will not imply that his/her candidature has been fully accepted by the Commission.
- b) The **Hall Tickets** for eligible applicants will be made available in the Commission's Website www.tnpsc.gov.in or www.tnpscexams.net or www.tnpscexams.in for downloading the same by applicants. No Hall Tickets will be sent by post. So the applicants should watch TNPSC website before the scheduled date of examination. The Applicants must comply with each and every instruction given in the Hall Ticket.

c) Communication to Applicants

Individual communication regarding the date and time of certificate verification and counselling will not be sent to the applicants by post. The details will be made available on the Commission's website. Applicants will be informed of the above fact only through SMS and e-mail.

- d) Grievance Redressal Cell for guidance of applicants:- In case of any guidance/ information / clarification of their applications, candidature etc., applicants can contact Tamil Nadu Public Service Commission's Office in person or over Telephone No.044-25332833 / 25332855 or the Commission's Office Toll-Free No.1800 425 1002 on all working days from 10.00 a.m. to 05.45 p.m or Commission's mail id contactnpsc@gmail.com

e) Mobile Phones and other Articles Banned:

- i. Applicants are not allowed to bring Cellular Phone, Watches and Ring with Inbuilt Memory Notes etc., or any other Electronic device and Non Electronic devices such as P&G Design Data Book, Books, Notes, Hand Bags and Recording Device either as separate piece or part of something used by the applicants such as Watch or Ring etc., to the examination hall / room on the date of examination.
 - ii. If they are found to be in possession of any such thing or instrument, they will not be allowed to write the examination further, besides invalidation of answer paper and / or debarment. If it is considered necessary they will be subjected to thorough physical search including frisking on the spot. (For further details refer '[Instructions to Applicants](#)').
 - iii. Applicants must not bring into the Examination Hall any article such as books, notes, loose sheets, electronic or any other type of calculators, mathematical and drawing instruments, Log Tables, stencils of maps, slide rules, Text Books, rough sheets etc., except the permitted writing material (i.e. Ball point pen). No colour pen or Pencil must be used.
 - iv. Applicants are advised in their own interest not to bring any of the banned items including Mobile Phones to the venue of the examination, as arrangements for safekeeping cannot be assured.
- f) Unless specific instruction is given, **applicants are not required to submit along with their online application any certificates** in support of their claims regarding age, educational qualifications, practising / service, physical qualification, community certificates and certificates regarding their physical disability etc., which should be submitted when called for by the Tamil Nadu Public Service Commission. The applicants applying for the examination should ensure that they fulfil all the eligibility conditions for admission to the Examination. Their admission at all the stages for which they are admitted by the Commission viz. Written Examination and Certificate verification will be purely provisional, subject to their satisfying the prescribed eligibility conditions. **If on verification at any time, it is found that they do not fulfil any of the eligibility conditions, their candidature for the recruitment will be liable for rejection / cancellation by the Commission.** ([For further details refer Instructions to Applicants](#)).
- g) If any of their claims is found to be incorrect, it will lead to rejection of their candidature and suitable penal action including debarment.
- h) **Unfair means strictly prohibited:** No applicants shall copy from the papers of any other candidate or permit his papers to be copied or give or attempt to give or obtain or

attempt to obtain irregular assistance of any description. ([For further details refer Instructions to Applicants](#)).

- i) **Conduct in Examination Hall:** No applicant should misbehave in any manner or create a disorderly scene in the Examination Hall or harass the staff employed by the Commission for the conduct of the examination. Any such misconduct will be severely viewed and penalised. ([For further details refer Instructions to Applicants](#)).
- j) For violation of "Instructions to Applicants" in any manner, suitable penalty will be imposed as per the Instructions to Applicants or as deemed fit by the Commission.

14. HOW TO APPLY

1. Applicants should apply only through online mode in the Commission's Websites www.tnpsc.gov.in / www.tnpscexams.net / www.tnpscexams.in
2. One Time Registration (OTR) and applicant Dashboard are mandatory before applying for any post. Applicant should register only once in the One Time Registration by paying Rs.150/- as Registration fee. Successfully registered One Time Registration is valid for 5 years from the date of Registration. All the applications should be submitted using the One Time Registration ID and password registered by the applicant.
3. For applying in One Time Registration, the applicants should have scanned image of their photograph, certificate wherever insisted and signature in CD/DVD/Pen Drive to upload the photo, certificate and signature.
4. Applicants who have already registered in One Time Registration on or before 29.09.2015 shall use their existing user ID and Password to create applicant Dashboard in the new One Time Registration system. No applicant is permitted to create more than one registration ID in One Time Registration.
5. Applicants should enter the Unique ID and password to view the already available information and update them. They shall not share the ID with any other person or agency.
6. One Time Registration is not an application for any post. It is just a collection of information from the applicants and giving a separate dashboard to each applicant to facilitate them to maintain their own profile. Applicant who wishes to apply for any post shall click "[Apply](#)" against the post Notified in the Commission's Website and use the same USER ID and PASSWORD given for ONE TIME REGISTRATION.
7. Applicants should select the name of the post or service for which they wish to apply.
8. Applicants are required to upload their photograph and signature as per the specifications given in the Guidelines for Scanning and Upload of Photograph and Signature.
9. An Online application uploaded without the photograph, specified documents and signature will be rejected.
10. All the particulars mentioned in the online application including name of the Candidate, Post applied, educational qualifications, Communal Category, Date of Birth, Address, Email ID, Centre of Examination etc. will be considered as final and no modifications will be allowed after the last date specified for applying online. Since certain fields are firm and fixed and cannot be edited, applicants are requested to fill in the online application form with the utmost care and caution as no correspondence regarding change of details will be entertained.
11. Print Option
 - a) After submitting the application, applicants can print / save their application in PDF format.

- b) On entering user ID and password, applicants can download their application and print, if required.
- c) Need not send the printout of the online application or any other supporting documents to the Commission. The certificates will be verified only when the applicants come up for next stage of selection.

12. One Time Registration will not be considered as an application for any post.

15. UPLOAD OF DOCUMENTS

The applicants must upload / submit the documents whenever called for specifically.

16. LAST DATE FOR SUBMITTING APPLICATION

The Online Application can be submitted upto 21.02.2018 till 11.59 p.m., after which the link will be disabled.

(For detailed information applicants may refer Commission's '[Instructions to Applicants](#)' at the Commission's website www.tnpsc.gov.in)

Secretary

DISCLAIMER

“The applicants while applying for the examination should furnish the details of equivalence of qualification declared in the form of Government order issued prior to the date of this notification, if any, and produce the same when called for by Tamil Nadu Public Service Commission, failing which their application will be rejected. The Government Orders issued regarding equivalence of prescribed qualification after the date of this notification will not be accepted.”

Secretary

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 field lines; Electric dipole, electric field 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 to 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, Leclanche, 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 inducing 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 – Fluorescence 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 γ -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 – feedback 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 – H₂SO₄ – 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 – K₂Cr₂O₇, CuSO₄.5H₂O, AgNO₃, Hg₂Cl₂, ZnCO₃, 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°, 2° and 3° – 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_3COCl) – 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° , 2° and 3° 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 – binomial 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 varieties 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 – Glaucoma – 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 – Hemocytometer – Urine – Sugar analysis – ECG – 'PQRST' wave – CT scan – Endoscopic (Laprosopic) 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 programmes-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.
