



TAMIL NADU PUBLIC SERVICE COMMISSION

Advertisement No. 710

Notification No. 8/2025

Date: 07.05.2025

Combined Technical Services Examination (Interview Posts)

Applications are invited only through online mode for direct recruitment to the posts in Combined Technical Services Examination (Interview Posts).

1. Important Instructions:

1.1. Candidates to ensure their eligibility for the examination:

All candidates are requested to carefully read the “Instructions to Applicants” available in the Commission’s website www.tnpsc.gov.in and this Notification. The candidates applying for the examination should ensure that they fulfill all eligibility conditions for admission to the examination. Their admission to all stages of the examination will be purely provisional, subject to their satisfying the eligibility conditions. Mere admission to the written examination, certificate verification, interview, counselling or inclusion of name in the selection list will not confer on the candidates any right to appointment. The Commission reserves the right to reject candidature at any stage, after due process even after selection has been made, if a wrong claim or violation of rules or instructions is confirmed.

1.2. Important Dates and Time:

Date of Notification	07.05.2025
Date of commencement of receiving application	13.05.2025
Last date and time for submission of online application	11.06.2025 11.59 P.M
Application Correction Window period	15.06.2025 12.01 A.M to 17.06.2025 11.59 P.M
Date and Time of Examination	
Paper – I	
Subject	Subject Code
Tamil Eligibility Test, General Studies, Aptitude and Mental Ability	503
Paper - II	
Subject Paper	Subject Code
Animal Husbandry and Veterinary Science (Degree Standard)	396
Animal Husbandry and Veterinary Science (PG Degree Standard)	397
Archaeology, Epigraphy, History, Manuscriptology and Tamil	565
Associate Company Secretaryship (Final)	473
Basics of Engineering	422
Bio-Technology	471

20.07.2025 to 23.07.2025

Business Administration	385	20.07.2025 to 23.07.2025
Chemical Engineering	405	
Chemical and Mechanical Engineering	528	
Computer Science, Information Technology, Electrical, Electronics, Communication and Mechanical Engineering	566	
Engineering and Business Administration (Infrastructure)	474	
Engineering and Business Administration (Project Management)	475	
Environmental Science	298	
Financial and Cost Accountancy	434	
Law	414	
Mining Engineering	347	
Personnel Management, Industrial Relations, Business Administration and Social Work	561	
Psychology	372	
Sociology	344	
Statistics	410	
Statistics and Economics	564	
Statistics, Mathematics and Economics (Degree Standard)	504	
Statistics, Mathematics and Economics (PG Degree Standard)	563	
Stenography in English	378	
Stenography in Tamil	383	
Traditional Architecture and Sculpture	511	
Town and Country Planning	382	
Town Planning	519	
Zoology and Medical Entomology	567	

1.2.1. The paper wise date and time for the examination, will be informed only through Commission's website www.tnpsc.gov.in

1.3. How to Apply:

1.3.1. One Time Registration and Online Application:

Candidates are required to apply online by using the Commission's website www.tnpscexams.in. The candidate needs to register himself / herself first at the One Time Registration (OTR) platform, available on the Commission's website, and then proceed to fill up the online application for the examination. If the candidate is already registered, he / she can proceed straightway to fill up the online application for the examination.

1.3.2. Application Correction Window:

After the last date for submission of online application, the Application Correction Window will open for 3 days from 15.06.2025 to 17.06.2025. During this period, candidates will be able to edit the details in their online application. After the last date of the Application Correction Window period, no modification is allowed in the online application.

1.3.3. Subject Paper Options:

Candidates should choose the subject paper(s) and specify in the online application. The candidates should only choose the subject paper(s) in which they have obtained the educational qualification or equivalent qualification for appearing in the examination.

1.3.4. The detailed instructions regarding how to apply and the examination centres are available in Annexure I of this Notification.

1.3.5. Any claim by the candidate after the submission of an online application will not be entertained.

1.4. Banned Items:

1.4.1. Candidates are not allowed to bring mobile phone, pager or any electronic equipment or programmable device or storage media like pen drive, smart watches, watches with in-built memory notes, rings with in-built memory notes, etc., or camera or Bluetooth devices or communication chips or any other equipment or related accessories either in working or switched off mode capable of being used as a communication device into the examination hall / room. Candidates are not allowed to bring non-electronic devices such as P&G Design Data Book, mathematical and drawing instruments, log tables, stencils of maps, slide rules, books, notes, loose sheets, guides, rough sheets, hand bags into the examination hall / room.

1.4.2. If they are found to have any such things or instruments, they will not be allowed to write the examination, besides invalidation of the answer sheet and / or debarment and / or rejection of candidature. If it is considered necessary, they will be subjected to a thorough physical search including frisking on the spot.

1.4.3. Candidates 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 of the same cannot be assured.

2. Warning:

2.1. All the recruitments by the Tamil Nadu Public Service Commission are purely merit-based. The Tamil Nadu Public Service Commission hereby cautions the candidates against touts and agents who may cheat, by making false promises of securing jobs through unfair means. The Tamil Nadu Public Service Commission shall not be responsible or liable for any loss that may be caused to any candidate on account of indulging in any sort of dealings with such unscrupulous elements.

2.2. Candidates are solely responsible for their claims in the online application. They cannot blame service providers like internet cafes / browsing centers / common service centers for the mistakes made while applying online for recruitment. Candidates are advised to check the filled-in online application before finally submitting the same.

3. Posts and Vacancies:

S. No.	Name of the Post	Post Code	Name of the Department / Organization	Distribution of Vacancies		Number of Vacancies	Level of Pay
1.	Deputy Director (Legal)	3540	Tamil Nadu Electricity Regulatory Commission	GT(G)	1	1	Level 29 CPS
2.	Assistant Director (Statistical Analyst)	3543		SF_SC	1	1 ^{\$}	Level 25 (CPS)
3.	Manager (Mines)	3393	Tamil Nadu Cements Corporation Limited	GT(G)	1	1	Level 26 (EPF)
4.	Deputy Manager (Environment)	3398		GT(G)	1	1	Level 25 (EPF)

5.	Assistant Manager (Mines)	3404	Tamil Nadu Cements Corporation Limited	GT(W)	1	3	Level 22 (EPF)
				BC(G)	1		
				SC(G)	1		
6.	Assistant Manager (P&A)	3486		MBC/DC(G)	1	1	
7.	Factory Manager (SKD)	3595	Tamil Nadu Magnesite Limited	GT(G)	1	1	Level 26 (EPF)
8.	Factory Manager (RKD)	3596		GT(G)	1	1	
9.	Assistant General Manager (Projects) Infrastructure	3345	Tamil Nadu Industrial Development Corporation Limited	GT(G)	1	2	Level 25 (EPF)
				SC(A)(W)(PSTM)	1		
10.	Assistant General Manager (Projects) Project Management	3344		GT(G)	1	2	
				SC(A)(W)(PSTM)	1		
11.	Assistant Secretary	3360		SC(A)(W)(PSTM)	1	2	Level 22 (EPF)
				MBC/DC(G)	1		
12.	Scientist 'C' Grade	3340	Forest	GT(G)	1	1	Level 25 (CPS)
13.	Chief Sthapathi	3525	Hindu Religious and Charitable Endowments	GT(G)	1	1	
14.	Regional Sthapathi	3526		GT(G)	3	21	Level 22 (CPS)
				GT(G)(PSTM)	1		
				GT(W)	2		
				BC(G)	4		
				BC(G)(PSTM)	1		
				BC(G)(W)	2		
				MBC/DC(G)	2		
				MBC/DC(G)(PSTM)	1		
				MBC/DC(W)	1		
				SC(G)	2		
				SC(W)	1		
				SC(A)(W)(PSTM)	1		
15.	Assistant Manager (Projects)	3346	Tamil Nadu Urban and Finance Infrastructure Development Corporation Limited	BL_MBC/DC(G)	1	2**	Level 22 (EPF)
				BL_SC(G)	1		
16.	Assistant Director of Statistics	2097	Economics and Statistics	Will be announced later		3@	Level 22 (CPS)
17.	English Reporter	2090	Tamil Nadu Legislative Assembly	BL_MBC/DC(G)	2	5*@	
				BL_SC(G)	2		
				SF_SC(G)	1		
18.	Tamil Reporter	3336		SF_SC(G)	1	1\$	
19.	Assistant Director of Town and Country Planning	1778	Town and Country Planning	Will be announced later		3	
20.	Assistant Superintendent (Chemical Wing)	1894	Micro, Small and Medium Enterprises	SC(A)(W)(PSTM)	1	1	

21.	Assistant Director Industries and Commerce (Survey and Statistics)	1876		SF_SC(G)	3	3 ^{\$}	Level 22 (CPS)
22.	Assistant Planner	3542	Chennai Metropolitan Development Authority	GT(G)	1	6	
				GT(W)	1		
				BC(G)	1		
				BC(W)	1		
				MBC/DC(G)(PSTM)	1		
				SC(G)(PSTM)	1		
23.	Psychologist	1942	Prisons and Correctional Services	GT(G)	1	3	
				GT(W)	1		
				BC(G)	1		
24.	Senior Accounts Officer	3535	Chennai Metropolitan Water supply and Sewerage Board	SF_ST(G)	1	1 ^{\$}	
25.	Research Assistant	1694	Institute of Veterinary Preventive Medicine, Ranipet	BL_GT(HH)	1	3*	
				GT(W)	1		
				BL_ST(G)	1		
26.	Sociologist	3025	Police	GT(G)	1	1	
27.	Senior Entomologist	2032	Public Health and Preventive Medicine	GT(G)	6	33	
				GT(G)(PSTM)	1		
				GT(W)	3		
				BC(G)	4		
				BC(G)(PSTM)	1		
				BC(W)	3		
				BC(M)(G)	1		
				MBC/DC(G)	4		
				MBC/DC(G)(PSTM)	1		
				MBC/DC(W)	2		
				SC(G)	2		
				SC(G)(PSTM)	1		
				SC(W)	2		
				SC(A)(G)(PSTM)	1		
				SC(A)(W)(PSTM)	1		
28.	Assistant Director Training / Principal, ITI	1729	Employment and Training	GT(G)	1	2 [@]	
				SF_ST(G)	1		
29.	Assistant Director (Technical)	3534	Archaeology	GT(G)	1	2	
				SC(A)(W)(PSTM)	1		
30.	Veterinary Assistant Surgeon	1695	Animal Husbandry and Veterinary Service	Will be announced later		216	
31.	Assistant Manager	3616	State Industries Promotion Corporation of Tamil Nadu Limited	BC(G)(PSTM)	1	4	
				BC(M)(G)	1		
				MBC/DC(G)	1		
				SC(G)	1		
32.	Assistant Manager	3665		GT(G)(PSTM)	1	2	
				SC(W)	1		
Total						330	

* Including backlog vacancies	
** Only backlog vacancies	
@ Including shortfall vacancies	
\$ Only shortfall vacancies	
Abbreviations:	
CPS - Contributory Pension Scheme	PFTR - Provident Fund Trust Rules
EPF - Employees' Provident Fund	SPF - Special Provident Fund
GSTR - Gratuity Fund Trust Rules	GSTR - Gratuity Scheme Trust Rules

3.1. The number of vacancies notified is tentative and is liable for modification, before the publication of the results of the written examination. Whenever the vacancies are revised, the number of candidates selected for the successive stages will also be revised commensurately.

3.2. The Commission reserves the right to include additional posts with different nomenclature and having similar eligibility conditions, as announced in this notification.

4. Eligibility Conditions:

4.1. Age Limit: (as on 01.07.2025)

The candidates should have completed the age of 21 years for all the posts. The category wise maximum age limit and age concession details are given below.

4.1.1. Others (Candidates not belonging to SCs, SC(A)s, STs, MBCs/DCs, BC(OBCM)s and BCMs):

S. No.	Name of the Post	Post Code	Maximum Age (Should not have completed)	Age Concession		
				Persons with Benchmark Disability	Ex-Servicemen	Destitute Widow
1.	Assistant Director of Town and Country Planning	1778	32**	42	50	No Maximum Age Limit
2.	Assistant Manager (Mines)	3404	32			
3.	Assistant Manager (P&A)	3486				
4.	Assistant Planner	3542				
5.	English Reporter	2090				
6.	Manager (Mines)	3393				
7.	Tamil Reporter	3336				
8.	Senior Accounts Officer	3535				
9.	Research Assistant	1694				
10.	Assistant Director Training / Principal, ITI	1729				
11.	Veterinary Assistant Surgeon	1695		NA		
12.	Deputy Director (Legal)	3540				
13.	Assistant General Manager (Projects) Infrastructure	3345				
14.	Assistant General Manager (Projects) Project Management	3344				
15.	Deputy Manager (Environment)	3398				
16.	Assistant Director (Statistical Analyst)	3543				
17.	Assistant Secretary	3360				

18.	Chief Sthapathi	3525	32	NA	50	No Maximum Age Limit
19.	Regional Sthapathi	3526				
20.	Assistant Director of Statistics	2097				
21.	Assistant Manager (Projects)	3346				
22.	Psychologist	1942				
23.	Sociologist	3025				
24.	Factory Manager (SKD)	3595				
25.	Factory Manager (RKD)	3596				
26.	Assistant Director (Technical)	3534	37			
27.	Senior Entomologist	2032				
28.	Assistant Superintendent (Chemical Wing)	1894				
29.	Assistant Director Industries and Commerce (Survey and Statistics)	1876	40			
30.	Scientist 'C' Grade	3340				
31.	Assistant Manager	3616			32	
32.	Assistant Manager	3665				
** - The maximum age limit of 32 years prescribed for appointment to this post shall not apply to persons appointed from the category of Town Planning Officers of Municipal Councils or other Local Bodies in the State.						
NA - Not Applicable, since persons with benchmark disability are not eligible to apply for this post.						

4.1.2. BC (OBCM)s, BCMs, MBCs/DCs, SCs, SC(A)s and STs:

S. No.	Name of the Post	Post Code	Maximum Age (Should not have completed)	Age Concession		
				Persons with Benchmark Disability	Ex-Servicemen	Destitute Widow
1.	Scientist 'C' Grade	3340	45	NA	55	45
2.	Sociologist	3025	No Maximum Age Limit	NA	No Maximum Age Limit	
3.	Factory Manager (SKD)	3595				
4.	Factory Manager (RKD)	3596				
5.	Chief Sthapathi	3525				
6.	Regional Sthapathi	3526				
7.	Assistant Director of Statistics	2097				
8.	Assistant Manager (Projects)	3346				
9.	Assistant General Manager (Projects) Infrastructure	3345				
10.	Assistant General Manager (Projects) Project Management	3344				
11.	Deputy Manager (Environment)	3398				
12.	Assistant Director (Statistical Analyst)	3543				
13.	Assistant Secretary	3360				
14.	Assistant Superintendent (Chemical Wing)	1894				

15.	Psychologist	1942	No Maximum Age Limit	NA	No Maximum Age Limit	
16.	Deputy Director (Legal)	3540				
17.	Senior Entomologist	2032				
18.	Assistant Director (Technical)	3534				
19.	Assistant Director Industries and Commerce (Survey and Statistics)	1876				
20.	Manager (Mines)	3393	No Maximum Age Limit			
21.	Assistant Manager (Mines)	3404				
22.	Assistant Manager (P&A)	3486				
23.	English Reporter	2090				
24.	Tamil Reporter	3336				
25.	Assistant Director of Town and Country Planning	1778				
26.	Senior Accounts Officer	3535				
27.	Research Assistant	1694				
28.	Assistant Director Training / Principal, ITI	1729				
29.	Veterinary Assistant Surgeon	1695				
30.	Assistant Planner	3542	BC(OBCM)s, BCMs MBCs/DCs-34, SCs, SC(A)s, STs-37	BC(OBCM)s, BCMs MBCs/DCs-44, SCs, SC(A)s, STs-47	55	No Maximum Age Limit
31.	Assistant Manager	3616		NA	BC(OBCM)s, BCMs MBCs/DCs-34, SCs, SC(A)s, STs-37	
32.	Assistant Manager	3665				

Abbreviations:

BC(OBCM)	-	Backward Classes (Other than Backward Class Muslims)
BCM	-	Backward Class Muslims
MBC / DC	-	Most Backward Classes / Denotified Communities
SC	-	Scheduled Castes
SC(A)	-	Scheduled Castes (Arunthathiyars)
ST	-	Scheduled Tribes
NA	-	Not Applicable, since persons with benchmark disability are not eligible to apply for this post

4.1.3. The above mentioned age concession will not apply to the Ex-Servicemen candidates who have already been recruited to any class or service or category, as per section 3 (j) (vii) of Tamil Nadu Government Servants (Conditions of Service) Act, 2016.

4.1.4. No maximum age limit shall mean that the candidates should not have completed 60 years of age as on 1.7.2025 or at the time of selection / appointment to the post.

4.1.5. Supporting Documents:

4.1.5.1. The date of birth will be verified against the tenth standard (SSLC) or twelfth standard (HSC) mark sheet, issued by the Tamil Nadu Board of Secondary Education and Tamil Nadu Board of Higher Secondary Education respectively. Those candidates whose date of birth is not mentioned in their tenth standard / twelfth standard mark sheet must upload their Birth Certificate / Transfer Certificate / Degree MarkSheets, instead of the tenth standard or twelfth standard mark sheet. Any other form of evidence will not be accepted. Failure to upload such a document shall result in the rejection of candidature after due process.

4.1.5.2. Candidates claiming age concession should upload the supporting documents for such a claim. Failure to upload such a document shall result in the rejection of candidature after due process.

4.2. Educational Qualification, Technical Qualification and Experience:

S. No	Name of the Post	Post Code	Qualification and Experience
1.	Deputy Director (Legal)	3540	(i) Bachelor Degree in Law from a recognized Indian University / Indian Law School (ii) Experience: 15 years of legal experience in a Government (or) in large private sector organization, quasi government undertaking or Public Sector undertaking
2.	Assistant Director (Statistical Analyst)	3543	(i) Must be a Post Graduate in Statistics (ii) Experience: 10 years experience in Government organization, Research organization, involving analysis of information sampling and reporting etc.,
3.	Manager (Mines)	3393	(i) B.E. Mining Engineering from a recognised University / Institute (ii) First Class Mines Manager Certificate of Competency in open cast mining (iii) Experience: 15 years in the field of mining
4.	Deputy Manager (Environment)	3398	(i) B.E./B.Tech in Environmental Science from a recognized University / Institute (ii) Experience: 10 years experience in the field of environment
5.	Assistant Manager (Mines)	3404	(i) B.E. Mining Engineering from a recognised University/Institute (ii) Second Class Mines Manager Certificate of competency in open cast mining (iii) Experience: 5 years in the field of mining
6.	Assistant Manager (P&A)	3486	(i) Master of Social Work or MBA (HR) or Master of Personnel Management and Industrial Relations from a recognized University/ Institution (ii) Experience: 5 years in the field of personnel administration out of which 3 years in the level of Executive(P&A) /Officer Cadre
7.	Factory Manager (SKD)	3595	(i) BE in Mechanical (or) Chemical Engineering (ii) Experience: 10 years in senior level
8.	Factory Manager (RKD)	3596	
9.	Assistant General Manager (Projects) Infrastructure	3345	(i) Full-time AICTE approved under graduate degree in Civil Engineering / Architecture/Planning with Full-time MBA or equivalent in Finance / International Business / Business Analytics / Investment / Project Management streams (ii) Atleast seven years of experience in Infrastructure sector. (iii) Experience in project management, procurements, Bid process management preferable
10.	Assistant General Manager (Projects) Project Management	3344	(i) Full-time AICTE approved under graduate degree in Engineering with Full-time MBA or equivalent in Finance / International Business / Business Analytics / Investment / Project Management streams (ii) Atleast seven years of experience in Project and Contract Management. (iii) Experience in Procurements, Bid Process Management preferable
11.	Assistant Secretary	3360	(i) Full time UG Degree with Associate Company Secretary (Final) (ii) 2 years of post qualification experience in a Company or Secretarial Consultancy

12.	Scientist 'C' Grade	3340	(i) Must possess a Ph.D in Biotechnology awarded by any University recognized by the University Grants Commission and (ii) Must have practical experience for not less than two years in the field of plan or supervising or managerial level in research field of wildlife management after acquiring the Ph.D.,
13.	Chief Sthapathi	3525	(i) Must possess Bachelor of Technology in Traditional Architecture or Bachelor of Fine Arts in Traditional Sculpture; and (ii) Must have practical experience for a period of not less than fifteen years in the field of temple renovation (iii) Other things being equal, preference shall be given to those who have obtained a degree in Bachelor of Technology in Traditional Architecture or Bachelor of Fine Arts in Traditional Sculpture awarded by the Government College of Architecture and Sculpture, Mamallapuram
14.	Regional Sthapathi	3526	(i) Must possess Bachelor of Technology in Traditional Architecture or Bachelor of Fine Arts in Traditional Sculpture; and (ii) Must have practical experience for a period of not less than ten years in the field of temple renovation (iii) Other things being equal, preference shall be given to those who have obtained a degree in Bachelor of Technology in Traditional Architecture or Bachelor of Fine Arts in Traditional Sculpture awarded by the Government College of Architecture and Sculpture, Mamallapuram
15.	Assistant Manager (Projects)	3346	(i) A Degree in Civil Engineering of any University or Institution recognized by the University Grants Commission for the purpose of its grant; and (ii) A Master Degree in Business Administration of any University or Institution recognized by the University Grants Commission for the purpose of its grant. Specialization in Project Management is desirable; and (iii) Not less than three years of experience in appraisal / execution of Urban Infrastructure projects in Public / Private Limited Companies.
16.	Assistant Director of Statistics	2097	(i) Must hold a First Class Degree in Statistics or Mathematics or Economics or Applied Economics or Business Economics with not less than 60% marks or equivalent Cumulative Grade Point Average (CGPA); or Master's Degree in Statistics or Mathematics or Economics or Applied Economics or Applied Statistics or Applied Mathematics or Business Economics or Operation Research or Mathematical Economics or Econometrics
17.	English Reporter	2090	(i) Must hold a bachelor's degree (ii) A pass in the Government Technical Examination in Shorthand in English by 180 words per minute High Speed Test (iii) A pass in the Government Technical Examination in Typewriting in English by the senior grade (iv) Others things being equal, preference shall be given to persons who are qualified to report in Tamil also
18.	Tamil Reporter	3336	(i) Must hold a bachelor's degree (ii) A pass in the Government Technical Examination in Shorthand in Tamil by 120 words per minute High Speed Test (iii) A pass in the Government Technical Examination in Typewriting in Tamil by the senior grade (iv) Others things being equal, preference shall be given to persons who are qualified to report in English also

19.	Assistant Director of Town and Country Planning	1778	<p>Post Graduate Degree in Town or City or Urban or Housing or Country or Rural or Infrastructure or Regional or Transport or Environmental Planning from a recognized University or Institute;</p> <p>(or)</p> <p>Must be an Associate of the Institute of Architects or possess B.Arch Degree or possess Degree or Diploma recognized and equivalent to the National Diploma in Architecture with experience in town planning works for a period of not less than three years in a Town Planning Department of Government or in the Statutory Boards or Urban Authorities or Universities or Recognized Research Institutions or Public Sector Undertakings or Semi Government or Statutory or Autonomous Organisations or Local Bodies;</p> <p>(or)</p> <p>Must possess B.E Degree (Civil or Highway) with experience in town planning works for a period of not less than two years in Town Planning Department of Government or in the Statutory Boards or Urban Authorities or Universities or Recognized Research Institutions or Public Sector Undertakings or Semi Government or Statutory or Autonomous Organisations or Local Bodies;</p> <p>(or)</p> <p>Must have passed Sections A & B of the Associate Member of the Institution of Engineers (India) Examination in the Civil Engineering Group with experience in town planning work for a period of not less than two years in Town Planning Department of the Government or in the Statutory Boards or Urban Authorities or Universities or Recognized Research Institutions or Public Sector Undertakings or Semi-Government or Statutory or Autonomous Organisations or Local Bodies;</p> <p>(or)</p> <p>Must possess Bachelor of Planning or Bachelor of Technology in Planning from a recognized University or Institute with two years experience in the field of Urban or Regional Planning in the State Governments or in the Statutory Boards or Urban Authorities or Universities or Recognized Research Institutions or Public Sector Undertakings or Semi-Government or Statutory or Autonomous Organisations or Local Bodies</p>
20.	Assistant Superintendent (Chemical Wing)	1894	<p>(i) A Degree in Chemical Engineering and</p> <p>(ii) Practical Experience for a period of not less than three years in a Research Institute or Engineering Workshop or Chemical Laboratory</p>
21.	Assistant Director Industries and Commerce (Survey and Statistics)	1876	Master's degree in Statistics or Mathematics or Economics
22.	Assistant Planner	3542	<p>(i) Must possess Masters degree in the field of Town and Country Planning or Urban and Regional Planning or Metropolitan Planning awarded by a University recognized by the University Grants Commission, India or All India Council for Technical Education such as Master of Town and Country Planning (MTP), M.Plan, M.Plan with specialization in Urban Planning, Regional Planning, Housing, Environment Planning, Transport Planning, Infrastructure Planning, Master of City Planning (MCP), Master of Urban and Regional Planning (MURP), M.Tech (Town and Country Planning) or M.Tech (Urban Planning), Master of Town and Regional Planning (MTRP), Master of Urban Development Planning (MUDP), Master of Urban Planning</p> <p>(or)</p>

			Bachelors Degree in Planning with 2 years experience in Town Planning from Government / Public Sector Undertakings / Registered Consultancy Firm
23.	Psychologist	1942	(i) Master's Degree in Psychology (ii) Other things being equal, preference shall be given to candidates who have undergone training or who possess experience for a period of not less than one year in testing or clinical work in the field of Psychology
24.	Senior Accounts Officer	3535	Must be either Chartered Accountant or Cost Accountant with 2 years of experience
25.	Research Assistant	1694	(i) M.V.Sc., (Micro-biology / Pathology / Parasitology / Dairy Micro-biology / Animal Biotechnology); (ii) Must have passed SSLC Examination or its equivalent examination with Tamil as one of the languages
26.	Sociologist	3025	Post Graduate Degree in Sociology
27.	Senior Entomologist	2032	(i) Must possess a first or second class B.Sc.(Hons.) or M.A. Degree or the M.Sc. degree in Zoology or M.Sc., Degree in Medical Entomology of a University or Institution recognized by the University Grants Commission for the purpose of the grant (ii) Practical experience in laboratory work for atleast 3 years
28.	Assistant Director Training / Principal, ITI	1729	(i) A degree in any branch of Engineering or Technology of any recognised University or Institution under the purview of All India Council for Technical Education (AICTE); and (ii) Practical experience in a workshop or factory for a period of not less than three years (iii) Other things being equal, preference will be given to persons who have completed one year Apprenticeship under the Government of India Scheme or one year training under the State Government Apprenticeship scheme. Explanation: A factory or workshop shall mean a factory as defined in Section 2(m) of the Factories Act, 1948 (Central Act 63 of 1948)
29.	Assistant Director (Technical)	3534	(i) Must possess M.A degree in Archaeology/Ancient History and Archaeology; Ph.D. in Archaeology/Ancient History and Archaeology/History and Archaeology / Tamil and Archaeology / Epigraphy and Archaeology. (or) Must possess M.A degree in Tamil / History / Indian History / History and Archaeology / History, Archaeology and Manuscriptology; Ph.D. in Tamil / History / Indian History / History and Archaeology / History, Archaeology and Manuscriptology / Tamil and Archaeology / Epigraphy and Archaeology; Must possess one year Post Graduate Diploma in Epigraphy and Archaeology awarded by the Institute of Epigraphy, Department of Archaeology / two years Post Graduate Diploma in Archaeology or in Epigraphy awarded by Institute of Archaeology and Museology, Department of Archaeology / Post Graduate Diploma in Archaeology awarded by Archaeological Survey of India (ii) Must have passed Tamil as one of the subject in degree level
30.	Veterinary Assistant Surgeon	1695	(i) B.V.Sc., Degree / B.V.Sc., & A.H and (ii) Must have passed SSLC Examination or its equivalent examination with Tamil as one of the languages (iii) Registered as Veterinary Practitioner with the Tamil Nadu State Veterinary Council constituted under the Indian Veterinary Council Act, 1984 (Central Act 52 of 1984)

31.	Assistant Manager	3616	Degree in Engineering (Mechanical / Electrical and Electronics / Computer Science and Engineering / Information Technology / Electronics and Communication Engineering) – (Second Class or its equivalent)
32.	Assistant Manager	3665	Post Graduate in Statistics or Economics (Second class or its equivalent)

4.2.1. The candidates should possess the educational qualification, technical qualification and experience prescribed for the post, on the date of notification.

4.2.2. The Under Graduate / Post Graduate degree / Ph.D Degree certificate qualification prescribed for the above posts should have been obtained by passing the required qualification in the following order of studies viz., SSLC + HSC / Diploma or its equivalent + Under Graduate Degree + Post Graduate Degree+ Ph.D Degree.

4.2.3. The period of practical or other experience should have been acquired after obtaining the educational qualification prescribed for the post.

4.2.4. Supporting Documents:

4.2.4.1. SSLC / HSC / Diploma / Degree / PG Degree / Integrated PG Degree / Ph.D Degree / Provisional Degree or Provisional Diploma Certificate / Consolidated Mark Sheet along with Degree or Provisional Degree Certificate shall be accepted as proof of educational qualification.

4.2.4.2. In cases where the Diploma / Degree / PG Degree / Ph.D Degree certificates had been issued after the date of notification, candidates must upload proof of the publication of results of the respective qualification(s) on or before the date of notification in the form of Provisional Diploma / Degree Certificate / Consolidated Mark Sheet.

4.2.4.3. Candidates claiming possession of qualification higher than that prescribed for a post, must upload certificates, issued on / before the date of notification, in support of such claim.

4.2.4.4. Candidates claiming experience, should upload the experience certificate in the format available in Annexure V of this notification.

4.2.4.5. For the post of Veterinary Assistant Surgeon (Post Code - 1695), candidates should upload the Registration Certificate for having registered as a Veterinary Practitioner with the Tamil Nadu State Veterinary Council.

4.2.4.6. In cases where the duration of the prescribed educational / technical course / experience has been specified in the notification, any discrepancy between the claim in the application and the documents uploaded shall result in the rejection of candidature after due process.

4.2.4.7. In case the Degree Certificate is lost or is not immediately available for reasons to be specified, an extract from the Convocation Register will be accepted as evidence of qualification.

4.2.4.8. The candidates claiming equivalence of qualification should upload a copy of the Government order at the time of submission of online application failing which his / her candidature will be rejected after due process. The Government orders relating to equivalence of qualification are available on the website of the Tamil Nadu State Council for Higher Education (www.tnsche.tn.gov.in). The Government orders regarding equivalence of qualification issued after the date of physical certificate verification will not be considered for this recruitment.

4.3. Medical and Physical Standards:

4.3.1. Candidates selected for appointment to the posts will be required to submit a certificate of physical fitness to the Appointing Authority at the time of joining the post.

4.3.2. The prescribed standards of visual acuity of the candidates selected for the following posts are mentioned below;

S.No.	Name of the Post	Post Code	Standard of Vision
1.	Scientist 'C' Grade	3340	Standard I or better Colour Blindness will be a disqualification
2.	Senior Entomologist	2032	Standard III or better Colour Blindness will be a disqualification
3.	Assistant Director of Town and Country Planning	1778	Standard II or better
4.	Assistant Planner	3542	
5.	Sociologist	3025	Standard III or better
6.	Deputy Director (Legal)	3540	
7.	Manager (Mines)	3393	
8.	Factory Manager (SKD)	3595	
9.	Factory Manager (RKD)	3596	
10.	Assistant General Manager (Projects) Infrastructure	3345	
11.	Assistant General Manager (Projects) Project Management	3344	
12.	Deputy Manager (Environment)	3398	
13.	Assistant Director (Statistical Analyst)	3543	
14.	Chief Sthapathi	3525	
15.	Assistant Secretary	3360	
16.	Assistant Manager (Mines)	3404	
17.	Assistant Manager (P&A)	3486	
18.	Regional Sthapathi	3526	
19.	Assistant Director of Statistics	2097	
20.	English Reporter	2090	
21.	Tamil Reporter	3336	
22.	Assistant Manager (Projects)	3346	
23.	Assistant Superintendent (Chemical Wing)	1894	
24.	Assistant Director Industries and Commerce (Survey and Statistics)	1876	
25.	Psychologist	1942	
26.	Senior Accounts Officer	3535	
27.	Research Assistant	1694	
28.	Assistant Manager	3616	
29.	Assistant Manager	3665	
30.	Assistant Director (Technical)	3534	
31.	Assistant Director Training / Principal, ITI	1729	
32.	Veterinary Assistant Surgeon	1695	

4.3.3. Candidates with defective vision should produce an Eye Fitness certificate from a qualified Eye Specialist working in a Government Hospital at the time of joining the post, to the Appointing Authority.

4.4. Knowledge in Tamil:

4.4.1. Candidates should possess adequate knowledge in Tamil on the date of this Notification. The candidate shall be deemed to possess an adequate knowledge of Tamil if, he/she has passed the SSLC examination or its equivalent examination / HSC / Degree, etc., with Tamil as one of the languages or studied the High School Course in Tamil medium; or passed the SSLC examination or its equivalent examination in Tamil medium; or passed the Second Class Language Test (Full Test) in Tamil conducted by the Tamil Nadu Public Service Commission.

4.4.2. Candidates must upload either SSLC / HSC / Degree / PG Degree mark sheets or proof of having passed the Second Class Language Test (Full Test) in Tamil conducted by the Tamil Nadu Public Service Commission, at the time of submission of online application.

4.4.3. Failure to upload documents in support of the possession of adequate knowledge of Tamil, shall result in the candidate being required to pass the Second Class Language Test (Full Test) in Tamil conducted by the Commission, within a period of two years from the date of his / her appointment, failing which he / she shall be discharged from service. This instruction is not applicable to the post of Research Assistant (Post Code - 1694), Veterinary Assistant Surgeon (Post Code -1695) and Assistant Director (Technical) (Post Code - 3534)

4.5. Restrictions on applying for the Examination:

4.5.1. The candidates not belonging to SCs, SC(A)s, STs, MBCs/DCs, BC(OBCM)s, and BCMs, who have put in 5 years or more of service, since his / her first appointment to a service of Government of India or Government of a State / Union Territory, are not eligible to apply even if they are within the age limit, except for the posts requiring experience.

4.5.2. Persons professing Hindu religion alone are eligible for the posts of Chief Sthapathi and Regional Sthapathi in the Hindu Religious and Charitable Endowments Department. Candidates applying for the post should upload a Community Certificate / Certificate from the Revenue Authorities concerned, in support of the religion claimed in the online application, while applying online. Failure to upload such a certificate, shall result in the rejection of candidature after due process.

4.5.3. The persons with benchmark disabilities are not eligible for the following posts;

S. No.	Name of the Post	Post Code	Department/Organization
1.	Deputy Director (Legal)	3540	Tamil Nadu Electricity Regulatory Commission
2.	Assistant Director (Statistical Analyst)	3543	
3.	Assistant General Manager (Projects) Infrastructure	3345	Tamil Nadu Industrial Development Corporation Ltd.,
4.	Assistant General Manager (Projects) Project Management	3344	
5.	Assistant Secretary	3360	
6.	Deputy Manager (Environment)	3398	Tamil Nadu Cements Corporation Ltd.
7.	Scientist 'C' Grade	3340	Forest
8.	Chief Sthapathi	3525	Hindu Religious and Charitable Endowments
9.	Regional Sthapathi	3526	
10.	Assistant Director of Statistics	2097	Economics and Statistics
11.	Assistant Manager (Projects)	3346	Tamil Nadu Urban Finance and Infrastructure Development Corporation Ltd.,
12.	Assistant Superintendent (Chemical Wing)	1894	Micro, Small and Medium Enterprises
13.	Assistant Director Industries and Commerce (Survey and Statistics)	1876	

14.	Psychologist	1942	Prisons and Correctional Services
15.	Sociologist	3025	Police
16.	Factory Manager (SKD)	3595	Tamil Nadu Magnesite Ltd.
17.	Factory Manager (RKD)	3596	
18.	Senior Entomologist	2032	Public Health and Preventive Medicine
19.	Assistant Director (Technical)	3534	Archaeology
20.	Assistant Manager	3616	State Industries Promotion Corporation of Tamil Nadu Ltd.,
21.	Assistant Manager	3665	

4.6. Posts identified suitable for Persons with Benchmark Disability:

4.6.1. The following posts are identified as suitable for reservation to persons with benchmark disabilities as detailed below:

S. No.	Name of the Post	Post Code	Suitable Category of Benchmark Disabilities
1.	Manager (Mines)	3393	LV,HH,LD(OA,OL),CP,LC,DF,AC,MuD,ASD, SLD,MD
2.	Assistant Manager (Mines)	3404	LV,HH,LD(OA,OL),CP,LC,DF,AC,MuD,ASD, SLD,MD
3.	Assistant Manager (P&A)	3486	HH,LD(OA,OL),CP,LC,DF,AC,MuD, ASD, SLD
4.	English Reporter	2090	LD, LC, DF, AC
5.	Tamil Reporter	3336	LD, LC, DF, AC
6.	Assistant Director of Town and Country Planning	1778	LV, HH, LD(OA,OL),LD(Others),AC,LC,DF
7.	Assistant Planner	3542	LV, HH, LD(OA,OL,OAOL),LC,DF,AC
8.	Senior Accounts Officer	3535	LV,HH,LD(OA,OL,BL,OAOL,BLOA),AC,LC,DF
9.	Research Assistant	1694	LV,HI,HH,LD,CP,LC,DF,AC,MuD,SLD,MD
10.	Assistant Director Training / Principal, ITI	1729	LV,HH,LD(OA,OL,BL)
11.	Veterinary Assistant Surgeon	1695	HH,LD,AC

Abbreviations:

LV – Low Vision	CP – Cerebral Palsy
HH – Hard of Hearing (with assistive device)	LC – Leprosy Cured
HI – Hearing Impaired	AC – Acid Attack Victim
LD – Locomotor Disability	DF – Dwarfism
BLOA – Both Leg One Arm	MuD – Muscular Dystrophy
OA – One Arm	ASD – Autism Spectrum Disorder
OL – One Leg	SLD – Specific Learning Disability
OAOL – One Arm One Leg	MD – Multiple Disabilities
	BL – Both Leg
LD(others) – Scoliosis and / or Kyphoscoliosis, Kyphosis, Spinal Cord Injuries and Spine Kyphoscoliosis.	

4.6.2. Persons with Benchmark Disability with only those category (ies) of disability (ies) mentioned above shall be eligible to apply for this Examination under Persons with Benchmark Disability category. Therefore candidates concerned are advised to read it carefully before applying appropriately for admission to the Examination.

5. Plan of Examination:

5.1. The Combined Technical Services Examination (Interview Posts) comprises of two stages (i) Written Examination and (ii) Interview. The candidates shall be admitted to the written examination, based on the claims made in the online application.

5.2. Onscreen certificate verification will be conducted before admission to the physical certificate verification and interview. The Commission will draw a list of candidates to be qualified for the onscreen certificate verification based on the criterion of minimum qualifying marks as mentioned in para 6 of notification and rule of reservation of appointments. The candidates will be admitted to onscreen certificate verification in the ratio of 1:3 / 1:4 (posts not requiring experience) and 1:10 (posts requiring experience).

5.3. The experience certificate uploaded by the candidates will be verified by the Committee constituted by the Head of the Department / Organisation concerned, during onscreen certificate verification. The Committee can reject the experience certificate of the candidate after due process. The decision of the Committee is final.

5.4. After onscreen certificate verification, based on the marks obtained in the written examination and subject to the rule of reservation of appointments, candidates shall be admitted to physical certificate verification and interview.

5.5. If the number of vacancies notified/reserved to be filled up by any one or more of the reservation categories [viz., Scheduled Castes, Scheduled Caste (Arunthathiyars), Scheduled Tribes, Most Backward Classes / Denotified Communities, Backward Classes (other than Muslim) or Backward Classes (Muslim) or General Turn], is five and above, the number of candidates to be admitted to the physical certificate verification and interview from those particular reservation categories, shall be two times the number of vacancies. If the number of vacancies notified / reserved to be filled up by any one or more of the reservation categories is four and below, the number of candidates to be admitted to the physical certificate verification and interview from those particular reservation categories, shall be three times the number of vacancies.

5.6. In respect of posts whose total cadre strength is one only and for which the rule of reservation of appointments does not apply, the number of candidates to be admitted to the physical certificate verification and interview on the basis of the marks obtained in the written examination shall be three.

5.7. The objective of the Interview is to assess the suitability of the candidate for the post by judging the candidate's personality, bearing, aptitude, general knowledge, technical knowledge etc.,

5.8. Marks obtained by the candidates in the Written Examination (Part B and Part C of Paper I and Paper II) and Interview would determine final ranking. The final selection will be made based on the total marks obtained by the candidate in Written Examination (Part B and Part C of Paper I, Paper II) and Interview taken together subject to rule of reservation of appointments. Candidates will be allowed to participate in counselling (wherever applicable) based on his / her rank.

5.9. Ranking Procedure:

5.9.1. The merit list or the ranking list shall be prepared on the basis of total marks obtained, by combining the marks secured by the candidates in the written examination with the marks secured in the Interview.

5.9.2. In case of two or more candidates scoring equal marks, the candidate senior in age shall be placed above in the merit list.

5.9.3. When the age too is the same, then the candidate securing higher marks in the written examination shall be placed above in the merit list.

5.9.4. When the marks obtained in the written examination are also equal, then the candidate who had submitted his application earlier to the Commission, as determined from the application number, shall be placed above in the merit list.

5.10. Appearance in Paper I, Paper II and the Interview is compulsory. Candidates who have not appeared either for Paper I, Paper II and Interview, will not be considered for selection, even if they secure the minimum qualifying marks.

6. Scheme of Examination:

6.1. For posts other than Tamil Reporter and English Reporter

Subject	Standard	No. of Questions	Duration	Maximum Marks	Minimum Qualifying Marks		Type of Examination	Mode of Examination		
					SCs, SC(A)s, STs, MBCs/DCs, BC(OBCM)s and BCMs	Others*				
Paper I	SSLC	100	3 hours	150	60	60	Objective	CBT		
Part A Tamil Eligibility Test										
Part B General Studies	Degree	75		150	135	180				
Part C Aptitude and Mental Ability	SSLC	25								
Paper II Subject Paper	Degree / PG Degree	200	3 hours	300	450					
Total (Part B and Part C of Paper-I and Paper-II)										
Interview				60	-					
Grand Total (Part B and Part C of Paper I, Paper II and Interview)				510	-					
*Others - Candidates not belonging to SCs, SC(A)s, STs, MBCs/DCs, BC(OBCM)s and BCMs										
CBT- Computer Based Test										

6.2 Paper II - Subject Paper

Name of the Post	Post Code	Subject Paper	Subject Code	Standard	Language of Question Paper
Deputy Director (Legal)	3540	Law	414	Degree	Tamil and English
Assistant Director (Statistical Analyst)	3543	Statistics	410	PG Degree	English
Manager (Mines)	3393	Mining Engineering	347	Degree	English
Assistant Manager (Mines)	3404				
Deputy Manager (Environment)	3398	Environmental Science	298	Degree	English
Assistant Manager (P&A)	3486	Personnel Management, Industrial Relations, Business Administration and Social Work	561	PG Degree	English
Factory Manager (SKD)	3595	Chemical and Mechanical Engineering	528	Degree	English
Factory Manager (RKD)	3596				
Assistant General Manager (Projects) Infrastructure	3345	Engineering and Business Administration (Infrastructure)	474	Degree and PG Degree	English

Assistant General Manager (Projects) Project Management	3344	Engineering and Business Administration (Project Management)	475	Degree and PG Degree	English
Assistant Secretary	3360	Associate Company Secretaryship	473	Final	English
Scientist 'C' Grade	3340	Bio-Technology	471	PG Degree	English
Chief Sthapathi	3525	Traditional Architecture and Sculpture	511	Degree	Tamil
Regional Sthapathi	3526				
Assistant Manager (Projects)	3346	Business Administration	385	PG Degree	Tamil and English
Assistant Director of Statistics	2097	Statistics, Mathematics and Economics	504	Degree	Tamil and English
Assistant Director of Town and Country Planning	1778	Town and Country Planning	382	PG Degree and Degree	English
Assistant Superintendent (Chemical Wing)	1894	Chemical Engineering	405	Degree	English
Assistant Director Industries and Commerce (Survey and Statistics)	1876	Statistics, Mathematics and Economics	563	PG Degree	English
Assistant Planner	3542	Town Planning	519	PG Degree	English
Psychologist	1942	Psychology	372	PG Degree	Tamil and English
Senior Accounts Officer	3535	Financial and Cost Accountancy	434	Final	English
Research Assistant	1694	Animal Husbandry and Veterinary Science	397	PG Degree	English
Sociologist	3025	Sociology	344	PG Degree	Tamil and English
Senior Entomologist	2032	Zoology and Medical Entomology	567	PG Degree	English
Assistant Manager	3616	Computer Science, Information Technology, Electrical, Electronics, Communication and Mechanical Engineering	566	Degree	English
Assistant Manager	3665	Statistics and Economics	564	PG Degree	English
Assistant Director (Technical) Archaeology	3534	Archaeology, Epigraphy, History, Manuscriptology and Tamil	565	PG Degree	Tamil and English
Veterinary Assistant Surgeon	1695	Animal Husbandry and Veterinary Science	396	Degree	English
Assistant Director Training / Principal, ITI	1729	Basics of Engineering	422	Degree	Tamil and English

6.2. For the posts of Tamil Reporter and English Reporter

Subject	Standard	No. of Questions	Duration	Maximum Marks	Minimum Qualifying Marks		Type of Examination	Mode of Examination
					SCs, SC(A)s, STs, MBCs/DCs, BC(OBCM)s and BCMs	Others*		
Paper I	SSLC	100	3 hours	150	60	60	Objective	CBT
Part A Tamil Eligibility Test								
Part B General Studies	Degree	75		150	135	180		
Part C Aptitude and Mental Ability	SSLC	25						
Paper II Subject Paper	Diploma	100	1 ½ hours	300				
Total (Part B and Part C of Paper-I and Paper-II)				450	-			
Interview				60	-			
Grand Total (Part B and Part C of Paper I, Paper II and Interview)				510	-			
*Others - Candidates not belonging to SCs, SC(A)s, STs, MBCs/DCs, BC(OBCM)s and BCMs								
CBT- Computer Based Test								

6.2.1 Paper II - Subject Paper				
Name of the Post	Post code	Subject Paper	Subject Code	Standard
Tamil Reporter	3336	Stenography in Tamil	383	Diploma
English Reporter	2090	Stenography in English	378	

6.3. The Paper II, Part B and Part C of Paper I will be evaluated only if the candidate secures minimum qualifying marks of 40% (i.e., 60 Marks) in Part A of Paper I.

6.4. The questions in Part B and Part C of Paper I will be set both in English and Tamil.

6.5. The differently abled candidates can avail exemption from writing Part A in Paper I (Tamil Eligibility Test). Such candidates have to furnish the required details in the online application without fail. Subsequent claim will receive no attention. The candidates should upload the Certificate of Disability in the format prescribed in the Annexure II of this notification.

6.6. The syllabus for the written examination is available in Annexure III of this Notification. Unit-wise distribution of questions mentioned in the syllabus is only indicative. Commission reserves the right to marginally increase or decrease the number of question in each unit if necessity arises.

6.7. The instructions to be followed while appearing for the examination, are available in Annexure IV of this Notification.

6.8. The Notification is published in English and Tamil versions. In case of doubt, English version is final.

7. Reservation of Appointments:

The rule of reservation of appointments applies to this recruitment. Reservation of appointment to Destitute Widow and Ex-Servicemen will not apply to this recruitment. The details of the reservation to candidates belonging to various categories are given in Annexure II of this Notification. In respect of posts whose total cadre strength is one only, the rule of reservation of appointment does not apply.

8. Communication to Candidates:

8.1. The memorandum of admission (Hall Ticket) for candidates will be made available on the Commission's website www.tnpscexams.in for downloading by candidates. The memorandum of admission will not be sent by post. The candidates must comply with every instruction given in the memorandum of admission.

8.2. The Commission will publish the written examination results, date and time of physical certificate verification, interview and counselling on the Commission's website www.tnpsc.gov.in. No individual communication will be sent to the candidates by Post. Candidates will be informed of the above fact only through SMS and e-mail, through the registered Mobile Number and email ID. Candidates are directed to watch the Commission's website in this regard. The Commission shall not be responsible if the communication does not reach the candidate due to an incorrect / invalid e-mail ID / mobile number and failure / delay in delivery of SMS / email to the candidates due to any reason including technical issues. Any representation from the candidates for non-receipt of SMS or e-mail will not be responded.

9. Communication with the Commission:

9.1. Candidates requiring clarification, can contact the office of the Tamil Nadu Public Service Commission in person or over the Toll-Free No.1800 419 0958 on all working days between 10.00 A.M and 5.45 P.M.

9.2. Queries relating to One Time Registration / online application may be sent to helpdesk@tnpscexams.in. Any other communication with the Commission must be made through email to grievance.tnpsc@tn.gov.in. Communications sent by post must be addressed only to the Secretary, Tamil Nadu Public Service Commission, TNPSC Road, V.O.C. Nagar, Park Town, Chennai - 600003.

9.3. All communications to the Commission should invariably contain the following particulars. Communications not containing the following particulars will not be attended to.

- a. Name of the examination
- b. Notification No. and year
- c. Registration No.
- d. Name of the Candidate (in full and in block letters)
- e. Complete postal address as given in the application
- f. Valid and Active E-mail ID

9.4. Request for exemption from age limit or other qualifications will receive no attention. Requests for furnishing causes of failure in the written examination or for non-selection based on the results of the written examination or for revaluation of answer sheets will not be entertained.

9.5. Requests from candidates for furnishing of their marks before the completion of the entire selection process, will not be entertained by the Commission.

10. Litigations:

The selection for appointment to the posts included in this recruitment is purely provisional subject to the final orders in the court cases, if any, pending before the Hon'ble High Court of Madras and Madurai Bench of Madras High Court, relating to this recruitment.

Secretary

Annexure I

How to Apply Online

1. **Website:** Candidates should apply only through online mode in the Commission's website viz., www.tnpscexams.in.

2. One Time Registration:

2.1. It is essential for the candidate to register himself / herself first at the One Time Registration (OTR) platform, available on the Commission's website, and then proceed to fill up the online application for the examination. Candidates should register only once in the One Time Registration by paying Rs.150/- as registration fee. Successfully registered One Time Registration is valid for five years from the date of registration.

2.2. During One Time Registration, the candidates should keep ready the scanned image of their photograph, taken within the last 3 months of size 20 KB – 50 KB and saved as "Photograph.jpg" and signature of size 10 KB – 20 KB and saved as 'Signature.jpg'. Both photograph and signature, of 200 DPI resolution, should be saved in a CD / DVD / Pen drive, to upload the same.

2.3. One Time Registration is not an application for any post. It is just a collection of information from the candidates and provides a separate dashboard to each candidate to facilitate the maintenance of their own profile. A candidate should make an online application separately for every examination for which he / she intends to appear.

2.4. A valid e-mail ID and mobile number are mandatory for One Time Registration. E-mail ID and mobile number are to be kept in 'ACTIVE' mode. Every candidate should have his / her email ID and password. No candidate should share his/her e-mail ID, password, mobile number with any other person. In case a candidate does not have a valid personal email ID, he / she should create a new email ID before applying online and must maintain that email account live. Inquiries relating to One Time Registration / online applications will be answered only if the inquiries are received through a registered e-mail ID.

2.5. Linking the Aadhaar number with One Time Registration (OTR) is mandatory for candidates. The information associated with the Aadhaar number including biometrics will be used only for identification purposes and will not be stored or shared. Candidates are requested to give their consent in their respective OTR. The Aadhaar details will be submitted to the Central Identities Data Repository (CIDR) only for authentication. Linking of the Aadhaar number is mandatory for all prospective candidates to create new OTR, renew / access the existing OTR and apply for any recruitment to be notified henceforth.

2.6. Details to be furnished during One Time Registration:

2.6.1. Candidates shall furnish their correct SSLC Register Number and Certificate Number, Month and Year of Passing, Medium of Instruction, and Name of the Board that issued the certificate while registering online. If any detail furnished is found to be wrong, the online application will be rejected at any stage after due process.

2.6.2. Candidates who have more than one SSLC mark sheet, should enter the details available in the mark sheet issued on the final attempt in which he / she had passed the SSLC examination.

2.6.3. Besides details related to SSLC, all other details required in the One Time Registration, shall be furnished without any mistake, as these details shall form the basis of all other details given subsequently by the candidate while filling the online application for each recruitment.

2.7. One-Time Registration (OTR) Edit:

2.7.1. The candidates shall be permitted to edit the details in the OTR whenever required by uploading the supporting documents.

2.7.2. Any changes in the One Time Registration must be made before the submission of the online application since the details furnished in the One Time Registration will be filled in automatically in the online application. Hence, incorrect particulars furnished in the One Time Registration may result in the rejection of online application after due process. Candidates are therefore advised to fill in the One Time Registration particulars carefully and correctly.

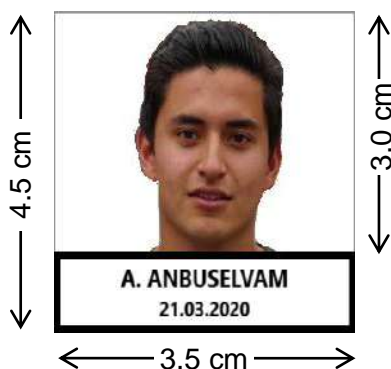
2.7.3. The Commission will not be responsible for any consequences arising out of failure on the part of the candidates to adhere to the instructions issued regarding One Time Registration or filling up of online application.

2.7.4. The instructions and illustration regarding One Time Registration are available on the website viz., www.tnpscexams.in.

3. Online Application:

3.1. A candidate who wishes to apply for any post shall click “APPLY” against the post notified on the Commission’s website and use the same User ID and Password given for One Time Registration. User ID and Password are to be created by the candidates themselves. In case the candidate forgets the User ID and Password, he/she can retrieve or reset them using the “FORGOT PASSWORD and FORGOT USER ID” options. The Commission will not furnish User ID and Password details to the candidates.

3.2. A candidate already having user ID and password, has to login. The available One Time Registration particulars will be displayed on the screen, including the photograph furnished at the time of One Time Registration, as well as the photographs uploaded with previous online applications. Candidates shall check and confirm the One Time Registration details before proceeding further. Thereafter, the candidates shall fill up additional details required in the specific recruitment application. If any of the One Time Registration details are found to be incorrect, the same should be corrected by clicking on OTR Edit. Changes made in the One Time Registration will be reflected only in online applications to be submitted subsequently.



3.3. Candidates shall upload their photograph taken on or after the date of notification at the time of submission of each and every online application. The photograph should be in colour, of passport size, against a white background and taken in a photo studio. The candidate should be photographed in frontal view showing both ears and part of the neck. The candidate should ensure that the name of the candidate and the date of photography (i.e., on or after the date of notification) are printed at the bottom of the photograph. The face of the candidate as well as his / her name and date of photography should be clearly visible in the photograph of height 4.5 cm (170 pixels) and width 3.5 cm (130 pixels). Of the total height of the photograph, the image of the candidate shall be 3.0 cm (115 pixels) and the candidate’s name and date of photography shall be 1.5 cm (55 pixels), as illustrated above. The photograph should be saved in a digital format (in CD / DVD / pen drive / hard drive), ready for uploading.

3.4. If the photograph is not available in a digital format, a passport-size photograph showing the image of the candidate along with the name of the candidate and the date of photography printed at the bottom, in the same dimensions as specified above, may be pasted on a plain white paper and scanned to obtain a resolution of 200 DPI. The image should then be cropped to show only the

photograph of size 20KB–50KB saved as “Photograph.jpg” and uploaded. The entire sheet of white paper on which the photograph is pasted should not be scanned / uploaded. Photographs taken using cellular phones, selfies, photocopies (Xerox) of photographs, photographs taken during family functions, at tourist places, or against a backdrop of plants or buildings should not be uploaded. Photographs of nature, wildlife, buildings, etc. shall not be uploaded. In case of uploading an inappropriate photograph, in violation of the aforementioned instruction, the application is liable to be rejected after due process.

3.5. Before uploading of signature, the candidate shall draw a box of dimension 6.0 x 2.0 cm (230 pixels x 75 pixels) on white paper and sign within the box, using a blue or black ink pen. The paper should then be scanned to obtain a resolution of 200 DPI. The image should then be cropped to show only the box with the signature, of size 10 KB –20KB, and saved as “Signature.jpg” and uploaded.

3.6. Clear images of the photograph and the signature should be uploaded in the correct dimensions, size, and format. Failure to upload/upload clear images of the photograph and signature will result in the rejection of the online application after due process.

3.7. Examination Centres:

3.7.1. While applying online, candidates shall be permitted to choose two district centres as their preference for the Written Examination. Candidates shall be allotted a venue in one of these two district centres. However, candidates with benchmark disability, shall be permitted to choose only one district centre and shall be allotted a venue in that district centre.

3.7.2. Candidates must appear for the examination at the venue they have been allotted, as mentioned in the memorandum of admission (hall ticket). Request for change of examination centre will not be permitted.

3.7.3. The Commission reserves the right to increase or decrease the number of examination centres and to re-allot the candidates accordingly. The Commission also reserves the right to allot a candidate to the nearby centre, if he / she could not be accommodated in the centres opted by the candidate.

3.7.4. The written examination will be held at the centres given below:

S.No.	Name of the Centre	Code	S.No.	Name of the Centre	Code
1.	Chennai	0101	11.	Salem	1701
2.	Coimbatore	0201	12.	Thoothukudi	2401
3.	Erode	0601	13.	Tiruchirappalli	2501
4.	Kancheepuram	0701	14.	Tirunelveli	2601
5.	Nagercoil	0801	15.	Tiruppur	3201
6.	Karur	0901	16.	Vellore	2701
7.	Madurai	1001	17.	Virudhunagar	2901
8.	Namakkal	1201			
9.	Pudukkottai	1501			
10.	Ramanathapuram	1601			

3.8. Application Preview:

3.8.1. Candidates should carefully fill in the details in the online application at the appropriate places and click on the ‘SAVE AND PROCEED’ button at the end of each page of the application. Before pressing the ‘SAVE AND PROCEED’ button, candidates are advised to verify each particular field in the application.

3.8.2. Candidates can edit/add/delete any information while filling the online application. Before finally submitting the application, candidates will be given the option of seeing a preview of their application. As soon as a candidate clicks the button meant for preview, an SMS will be sent to the registered mobile number, informing the availability of such a preview in the registered email ID provided by the candidate.

3.8.3. Once the candidate desires to make modifications based on the preview arrangement as indicated in the paragraph above, he/she may re-open the application and make necessary modifications using the Edit option and make the final submission of the corrected application, before the last date prescribed for submission of the online application. It is the responsibility of the candidate to carefully check the details available in the preview and make suitable corrections, if any, in the application / OTR before final submission. The candidate will be solely responsible for any non-rectification or non-submission of the application.

3.8.4. An individual is considered to have applied for a recruitment, if and only if, he / she finally submits the application, by clicking the 'SUBMIT' button. The mere availability of a preview shall not be tantamount to "having applied" for a particular recruitment.

3.9. Examination Fee:

3.9.1. The examination fee of Rs. 200 (Rupees Two hundred only) should be paid at the time of submitting the online application for this recruitment, unless exemption of fee is claimed.

3.9.2. For every additional subject paper opted by the candidate in the online application Rs.200 for each subject paper should be paid additionally. Further, if the candidate withdraws one or more subject paper(s) then the fee already paid by the candidate will not be refunded.

3.9.3. Candidates belonging to special categories can avail of exemption from paying examination fees as per eligibility criteria. For further details refer to Annexure II of this Notification.

3.9.4. The total number of free chances availed, will be calculated based on claims made in previous applications. The number of free chances availed by the candidate may be verified by the Commission at any stage of the selection process. In case a candidate makes a false claim for exemption from payment of the application fee by suppressing information regarding his/her previous application(s), his / her candidature shall be rejected after due process and he / she shall be debarred for a period of one year, from appearing for examinations conducted by the Commission.

3.9.5. Candidates are directed to carefully choose the option "Yes" or "No" regarding availing of the fee concession. The choice made, cannot be modified or edited after successful submission of the online application. Candidates are advised in their own interest, to keep an account of the number of times fee concession has been availed, irrespective of the information displayed in the <Application History> of the candidate dashboard.

3.9.6. An application (irrespective of the post applied for) claiming fee concession will operate to exclude one chance from the number of free chances allowed. Candidates who have availed the maximum number of free chances permitted / candidates who do not wish to avail of the fee concession / candidates who are not eligible for fee concession shall choose the option "No" against the query regarding fee concession. Such candidates shall thereafter pay the requisite fee through the prescribed mode of payment.

3.9.7. Failure to pay the prescribed fee in time, along with the online application, will result in the rejection of the application after due process.

3.10. Examination Fee Payment:

3.10.1. After submitting the details in the online application, the candidates can pay the examination fee by online mode through Net Banking / Credit card / Debit card / UPI on or before the last date of submission of the online application by choosing the option in the online application. Candidates have to pay the service charges also as applicable.

3.10.2. Offline mode of payment if any received 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 and the same will not be returned or refunded.

3.10.3. To facilitate payment of fees through the online mode, an additional page of the application format will be displayed wherein candidates may follow the instructions and fill in the requisite details to make payment. There is a possibility of online payment failure. Hence, if the online payment fails, candidates can check the status of the earlier transaction. If the earlier transactions have failed, the candidate shall retry paying the fee again by online mode. In case of online payment failure, the amount debited from the candidate's account will be reverted to his/her account. The candidates have been given a provision to check the status of the transaction made. If all the attempts/transactions have failed, candidates have to make the payment again. The Commission is not responsible for online payment failure. It is the responsibility of the candidates to ensure that the transaction made by them is successful.

3.10.4. After submitting the payment information in the online application format, wait for the intimation from the server. Meanwhile, DO NOT press 'Back' or 'Refresh' button to avoid payment failure or double payment.

3.10.5. If the online transaction has been successfully completed, an Application Number / Applicant ID will be generated. Candidates should note the Application Number / ID for future reference in respect of the recruitment applied for.

3.10.6. Tamil Nadu Public Service Commission reserves the right to change the mode of payment at any time.

3.11. Online Application Edit:

3.11.1. The candidates shall be permitted to edit all the details in the online application till the last date stipulated for submission of the online application.

3.11.2. If the candidate desires to change his / her photograph and/or signature in his / her online application, the candidate shall select the edit option in the online application to re-upload them which must be saved finally before submitting the online application.

3.11.3. Some of the information contained in the online application has been brought forward from the candidate's one-time registration. If such information has to be edited in the online application, the candidate shall select the edit profile option in One Time Registration (OTR) and shall make and save necessary corrections. After doing so, the candidate shall select the edit option in the online application and edit the details as desired. The candidate shall save the changes and submit it finally. The candidate shall take a printout of the same if required.

3.11.4. After editing the online application, if the edited details are not finally saved and submitted by the candidate, the details provided by the candidate in the application submitted before editing shall only be considered. If the candidate has to pay a fee based on the edited details, the candidate shall pay the prescribed examination fee in online. Candidates who have already paid the examination fee are not required to pay.

3.12. Application Correction Window:

3.12.1. After the last date for submission of the online application, the Online Application Correction Window shall open for 3 days as mentioned in Para 1 'Important Instructions' of this Notification. During this period, candidates will be able to edit the details in their online application. After the last date of the Correction Window period, no modification is allowed in the online application.

3.12.2. The applications shall be processed as per the details finally furnished by the candidates. It is the responsibility of the candidates and the Commission has no liability for subsequent rejection of the application consequent to the editing details already submitted in the online application. Request / representation received for modification of claims in the online application, in any mode shall not be entertained.

3.13. Candidates are advised in their own interest to apply online much before the closing date and not to wait till the last date to avoid the possibility of disconnection / inability / failure to log on to the Commission's website on account of heavy load on internet / website.

3.14. The Commission does not assume any responsibility for the candidates not being able to submit their online applications within the last date on account of the aforesaid reasons or for any other reason beyond the control of the Commission.

3.15. Candidates need not send the printout of the online application or any other supporting documents to the Commission by post unless asked for specifically.

3.16. The name of the candidate or the name of his / her father or mother, should be spelt correctly in the application as it appears in the certificates / mark sheets.

3.17. Any discrepancy between the details as given in the online application and the documents submitted shall result in the summary rejection of candidature after due process.

3.18. The Commission will not be responsible for any consequences arising out of furnishing of incorrect and / or incomplete details in the application or omission to provide the required details in the application.

3.19. Upload of Documents:

3.19.1. Candidates should upload the required documents of proof in respect of all the claims made in the application with reference to this notification while applying for this examination. If the required certificates are not uploaded by the candidate, within the stipulated time, his/her candidature will be rejected after due process.

3.19.2. The candidates shall have the option of verifying the uploaded certificates / documents through their OTR. If any of the certificates / documents have wrongly been uploaded or not uploaded or if any modifications are to be done in the uploading of documents, the candidates shall be permitted to upload / re-upload the documents till two days prior to the date of hosting of hall tickets for that particular examination. (i.e., twelve days prior to the date of examination).

3.19.3. The uploaded credentials shall be mapped with the One Time Registration of the respective candidate along with the Application number and Notification Number (i.e., with reference to the notification for each post), so that they can be used during future submission of application by the same candidates.

3.19.4. The documents uploaded by the candidates shall be linked with OTR and retained in the server for a maximum period of two years. If the candidate applies subsequently for other posts within two years, the documents that were already uploaded shall be displayed to the candidate during the online application process for confirmation and the same need not once again be uploaded by the candidates. If the candidate applies to other posts after the period of retention i.e. two years, the candidate shall be instructed to upload all the documents afresh.

4. Information regarding criminal cases / disciplinary cases:

4.1. Candidates who have declared pending criminal or disciplinary cases in their online application, must upload a copy of the First Information Report (FIR) or memorandum of charges / show cause notice, as the case may be. Failure to upload such papers at the time of submission of online application, shall result in rejection of candidature after due process.

4.2. Candidates who have declared conviction in criminal cases or punishment in disciplinary cases, in their online application, must upload the relevant court orders and / or release orders or memorandum of proceedings, as the case may be, at the time of submission of online application. Failure to upload such papers shall result in the rejection of candidature after due process.

4.3. In case any criminal case is filed / disciplinary action is taken against or conviction / punishment is imposed on a candidate after submission of the online application, at any stage of the recruitment process before the completion of the entire selection process, such candidates should report this fact to the Commission in the next immediate stage when Commission calls for uploading documents. Failure to comply with these instructions shall result in the rejection of candidature after due process and debarment for a period of one year.

4.4. The pendency of disciplinary cases / criminal cases shall in no way affect the selection prospects of candidates. However, failure to inform such pendency, shall result in the rejection of candidature after due process.

4.5. The selection of the candidates against whom the criminal case / disciplinary case is pending, will be withheld subject to the outcome of the pending criminal / disciplinary case.

5. Employment Details:

5.1. Candidates who are in the service of the Indian Union or a State in India or in the employment of Local Bodies or Universities or Quasi Government Organizations or Public Sector Units constituted under the authority of the Government of India or of a State in India, in regular service, must inform the Commission of such fact, at the time of applying. Suppression of the fact of employment by candidates shall result in rejection of candidature after due process.

5.2. Candidates need not send their applications through their Head of Department or employer. Instead, they may directly apply to the Commission after duly informing their employer in writing that they are applying for the particular recruitment, subject to the condition that they should produce 'No Objection Certificate' in the format prescribed as shown below.

No Objection Certificate

This is to certify that Thiru/Tmt./Selvi. (Name) employed as (designation) in this office from (specify the date from which appointed), who is regularly / temporarily appointed and who is as probationer / approved probationer / full member, had applied for the post of in service called for by the Tamil Nadu Public Service Commission through online application form to the Tamil Nadu Public Service Commission and informed the fact to this department / organisation. This department / organisation has 'no objection' for processing the said application of the individual by the Tamil Nadu Public Service Commission subject to the condition that the particulars furnished by the individual are found to be correct.

Appointing Authority
(Signature with Seal)

* In the case of a Government servant against whom departmental or criminal proceedings are contemplated or pending, the appointing authority shall inform the said fact to the Tamil Nadu Public Service Commission along with the "No Objection Certificate" and shall also inform the Tamil Nadu Public Service Commission about the initiation of departmental or criminal proceedings, if any, subsequently, till the date of his / her actual relief from the office to take up appointment in the post for which he / she has been selected.

5.3 Candidates who secure employment after submission of online application, must upload a 'No Objection Certificate' or at least an undertaking regarding the fact of employment and that 'No Objection Certificate' has been applied for. Failure to upload the 'No Objection Certificate' / an undertaking shall result in the rejection of candidature after due process.

5.4. Candidates who have been removed / dismissed / resigned from a post, shall intimate such fact to the Commission, through the One Time Registration Dashboard. Any failure in this regard shall result in the rejection of the candidature after due process.

5.5. Any change in the employment status of the candidate, whether appointment to or resignation / removal / dismissal, from a post, at any stage of the recruitment process, until completion of the entire selection process, must be informed to the Commission. Any failure in this regard shall result in the rejection of the candidature after due process.

5.6. Failure on the part of employed candidates to upload the 'No Objection Certificate' shall result in the rejection of candidature after due process.

Annexure II

1. Ex-Servicemen:

1.1. 'Ex-Serviceman' means,

1.1.1. any person who had served in any rank (whether as combatant or not) in the Armed Forces of the Union for a continuous period of not less than six months after attestation, if released between 1st July 1979 and 30th June 1987 (both days inclusive):

- a. for reasons other than at his own request or by way of dismissal or discharge on account of misconduct or inefficiency; or
- b. at his own request after serving for a period of not less than five years; or

1.1.2. any person who had served in any rank (whether as combatant or not) in the Armed Forces of the Union, and had retired or had been released on or after 1st July 1987 from such service:

- a. at his own request after earning his pension; or
- b. on medical grounds attributable to military service or circumstances beyond his control and awarded medical or other disability pension; or
- c. otherwise than at his own request after earning his pension, as a result of reduction in establishment; or
- d. after completing specific period of engagement, otherwise than at his own request or by way of dismissal or discharge on account of misconduct or inefficiency and has been given a gratuity.

1.1.3. any person of the Territorial Army of the following categories, namely, pension holder for continuous embodied service, person with disability attributable to military service and gallantry award winner retired on or after 15th November 1986; or

1.1.4. any person of the Army Postal Service, who retired on or after 19th July 1989 directly from the said service without reversion to Postal and Telegraph Department with pension or who has been released on or after 19th July 1989 from such service on medical grounds attributable to military service or circumstances beyond his control and awarded medical or other disability pension; or

1.1.5. any person who was on deputation in the Army Postal Service for more than 6 months prior to the 14th day of April 1987; or

1.1.6. any person who was boarded out or released on medical grounds and granted medical or disability pension; or

1.1.7. any person discharged on or after July 1987 under Army Rule 13(3) III (V) for the reason that his service is no longer required and in receipt of pension; or

1.1.8. such other person as may be notified by the Government from time to time.

1.2. Ex-Servicemen does not mean the wards / dependants of those mentioned above.

1.3. A person discharged before July 1987 under Army Rule 13(3) III (V) for the reason that his service is no longer required is not an Ex-Serviceman.

1.4. 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.

1.5. Persons serving in the Armed Forces shall be eligible to apply for posts under the Government, if they are due to complete the specified term of their engagement in the Armed Forces, within one year from the last date prescribed by the Commission, for receipt of the online application in respect of a particular recruitment.

1.6. Fee Concession: Two free chances.

1.7. Reservation of Appointments: The rule of reservation of appointment to Ex-Servicemen will not apply to this recruitment.

1.8. Supporting Documents:

1.8.1. A candidate who claims to have been demobilised from the Army or Navy or Air Force needs to upload either a properly authenticated extract from his Discharge Certificate (viz., a Bonafide Certificate) issued by the Ex-Servicemen's Welfare Board in the format as depicted below or the Pension Pay Order at the time of submission of online application.

Form of Bonafide Certificate to be produced by Ex-Servicemen

1. Name of the applicant
2. Rank held, Name of the Service (Army / Navy / Air force)
3. Date of enrolment
4. Date of discharge
5. Reasons for discharge
6. Whether an 'Ex-Serviceman' should be specifically stated
7. Whether in receipt of pension
8. P.P.O No.
9. Conduct and character while serving in the defence forces
10. Name of the post applying for
11. Unique Service No.
12. Whether the individual is employed in any post under the Government of Tamil Nadu? If so, Name of the post and date of appointment

1.8.2. Persons serving in the Armed Forces who are due to complete the specified term of their engagement in the Armed Forces, within one year from the last date prescribed by the Commission, for receipt of the online application in respect of this recruitment, shall upload at the time of submission of online application an undertaking and a certificate from their Commanding Officer in the format as depicted below.

Form of Undertaking to be given by the Serving Personnel

I hereby accept that if selected on the basis of the recruitment / examination to which this application relates, I will produce documentary evidence to the satisfaction of the appointing authority that I have been duly released / retired / discharged from the Armed Forces and I am entitled to the benefits admissible to Ex-Servicemen given under Section 63 of the Tamil Nadu Government Servants (Conditions of Service) Act, 2016.

Place:

Signature of the Applicant

Form of Certificate for Serving Personnel

I hereby certify that according to the information available with me (Number)(Rank) (Name) is due to complete the specified term of his engagement with the Armed Forces on the (date)

Place:

Signature of the Commanding Officer

Date:

1.8.3. Failure to upload the supporting documents, shall result in the rejection of claim after due process.

1.9. Persons with Benchmark Disability:

1.9.1. "Person with Benchmark Disability" means a person with not less than forty percent of a specified disability where specified disability has not been defined in measurable terms and includes a person with disability where specified disability has been defined in measurable terms, as certified by the certifying authority designated by the Government under sub-section (1) of section 57 of the Rights of Persons with Disabilities Act, 2016.

1.9.2. Fee Concession: Full exemption.

1.9.3. Reservation of Appointments: (For posts identified suitable for persons with benchmark disabilities) Out of the total number of appointments to be made in the communal reservation categories, viz., Scheduled Castes / Scheduled Caste - Arunthathiyars (on preferential basis) / Scheduled Tribes / Most Backward Classes / Denotified Communities / Backward Classes (other than Muslim) / Backward Classes (Muslim) and General Turn, in the case of appointment made by direct recruitment, 1% each shall be reserved for persons with benchmark disabilities under categories (a), (b) and (c) and 1% for persons with benchmark disabilities under categories (d) and (e) both taken together, namely:

- a. blindness and low vision;
- b. deaf and hard of hearing;
- c. locomotor disability including cerebral palsy, leprosy cured, dwarfism, acid attack victims and muscular dystrophy;
- d. autism, intellectual disability, specific learning disability and mental illness;
- e. multiple disabilities from amongst persons under categories (a) to (d) including deaf-blindness in the posts identified for each disability.

1.9.4. Supporting Documents:

1.9.4.1. The Persons with Benchmark Disability should produce Disability Certificate at the time of online application in the format shown below, prescribed in the Rights of Persons with Disabilities Rules, 2017 and issued by the competent authority as mentioned below;

Form V
Certificate of Disability
(In cases of amputation or complete permanent paralysis of limbs or dwarfism and in case of blindness)

(Name and Address of the Medical Authority issuing the Certificate)

Recent passport size
attested photograph
(Showing face only) of
the person with
disability.

Certificate No. _____

Date: _____

This is to certify that I have carefully examined Shri./ Smt./ Kum. _____
 Son / wife / daughter of Shri. _____ Date of Birth (DD/ MM/YY) _____ Age _____
 years, male / female Registration No. _____ permanent resident of House No. _____ Ward /
 Village / Street Post Office _____ District State _____, whose photograph is affixed above,
 and am satisfied that:

(A) he / she is a case of:

- locomotor disability
- dwarfism
- blindness

(Please tick as applicable)

(B) the diagnosis in his / her case is _____

(C) he / she has _____% (in figure) _____ percent (in words) permanent locomotor disability/
 dwarfism/ blindness in relation to his / her _____ (part of body) as per guidelines
 (..... number and date of issue of the guidelines to be specified).

2. The applicant has submitted the following document as proof of residence:-

Nature of Document	Date of Issue	Details of authority issuing certificate
--------------------	---------------	--

(Signature and Seal of Authorized Signature of notified Medical Authority)

Signature/ thumb
impression of the
person in whose favour
certificate of disability is
issued.

Form VI
Certificate of Disability
(In cases of multiple disabilities)
(Name and Address of the Medical Authority issuing the Certificate)

Recent passport size
attested photograph
(Showing face only) of
the person with
disability.

Certificate No. _____

Date. _____

This is to certify that we have carefully examined Shri./ Smt./ Kum. _____ son/ wife/ daughter of Shri _____ Date of Birth (DD/ MM/ YY) _____ Age _____ years, male/ female _____. Registration No. _____ permanent resident of House No. _____ Ward/ Village/ Street _____ Post Office _____ District _____ State _____, whose photograph is affixed above, and am satisfied that:

(A) he/ she is a case of Multiple Disability. His/ her extent of permanent physical impairment/ disability has been evaluated as per guidelines (..... number and date of issue of the guidelines to be specified) for the disabilities ticked below, and is shown against the relevant disability in the table below:

Sl. No.	Disability	Affected part of body	Diagnosis	Permanent physical impairment/ mental disability (in%)
1.	Locomotor disability	@		
2.	Muscular Dystrophy			
3.	Leprosy cured			
4.	Dwarfism			
5.	Cerebral Palsy			
6.	Acid attack Victim			
7.	Low vision	#		
8.	Blindness	#		
9.	Deaf	£		
10.	Hard of Hearing	£		
11.	Speech and Language disability			
12.	Intellectual Disability			
13.	Specific Learning Disability			
14.	Autism Spectrum Disorder			
15.	Mental illness			
16.	Chronic Neurological Conditions			
17.	Multiple sclerosis			
18.	Parkinson's disease			
19.	Haemophilia			
20.	Thalassemia			
21.	Sickle Cell disease			

(B) In the light of the above, his/ her over all permanent physical impairment as per guidelines

(..... number and date of issue of the guidelines to be specified), is as follows : -

In figures :- ----- percent

In words :- ----- percent

2. This condition is progressive/ non-progressive/ likely to improve/ not likely to improve.

3. Reassessment of disability is:

(i) not necessary, or

(ii) is recommended/ after years months, and therefore this certificate shall be valid till --- --- ---

(DD) (MM) (YY)

@ e.g. Left/ right/ both arms / legs

e.g. Single eye

£ e.g. Left/ Right/ both ears

4. The applicant has submitted the following document as proof of residence:-

Nature of document	Date of issue	Details of authority issuing certificate
--------------------	---------------	--

5. Signature and seal of the Medical Authority.

Name and Seal of Member	Name and Seal of Member	Name and Seal of the Chairperson
-------------------------	-------------------------	----------------------------------

Signature/ thumb impression of the person in whose favour certificate of disability is issued.
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Form VII
Certificate of Disability
(In cases other than those mentioned in Forms V and VI)
(Name and Address of the Medical Authority issuing the Certificate)

Recent passport size attested
photograph (Showing face
only) of the person with
disability.

Certificate No. _____

Date. _____

This is to certify that I have carefully examined Shri./ Smt./ Kum. _____ son / wife / daughter of Shri _____ Date of Birth (DD/ MM/ YY)____ __ Age _____ years, male/ female _____ Registration No. _____ permanent resident of House No. _____ Ward/ Village/ Street _____ Post Office _____ District _____ State _____, whose photograph is affixed above, and am satisfied that he/ she is a case of _____ disability. His/ her extent of percentage physical impairment/ disability has been evaluated as per guidelines (..... number and date of issue of the guidelines to be specified) and is shown against the relevant disability in the table below:-

Sl. No.	Disability	Affected part of body	Diagnosis	Permanent physical impairment/mental disability (in %)
1.	Locomotor disability	@		
2.	Muscular Dystrophy			
3.	Leprosy cured			
4.	Cerebral Palsy			
5.	Acid attack Victim			
6.	Low vision	#		
7.	Deaf	€		
8.	Hard of Hearing	€		
9.	Speech and Language disability			
10.	Intellectual Disability			
11.	Specific Learning Disability			
12.	Autism Spectrum Disorder			
13.	Mental illness			
14.	Chronic Neurological Conditions			
15.	Multiple sclerosis			
16.	Parkinson's disease			
17.	Haemophilia			
18.	Thalassemia			
19.	Sickle Cell disease			

(Please strike out the disabilities which are not applicable)

2. The above condition is progressive / non-progressive / likely to improve / not likely to improve.

3. Reassessment of disability is:

(i) not necessary, or

(ii) is recommended/ after ___ years ___ months, and therefore this certificate shall be valid till
(DD/ MM/ YY) _____

@ - eg. Left/ Right/ both arms/ legs

- eg. Single eye/ both eyes

€ - eg. Left/ Right/ both ears

4. The applicant has submitted the following document as proof of residence:-

Nature of Document	Date of Issue	Details of authority issuing certificate

(Authorized Signatory of notified Medical Authority)
(Name and Seal)

Countersigned
{Countersignature and seal of the
Chief Medical Officer/ Medical Superintendent/
Head of Government Hospital, in case the
Certificate is issued by a medical authority who is
not a Government servant (with seal)}

Signature/ thumb impression of the person in whose favour certificate of disability is issued.
--

List of Certifying Authority for the issue of disability certificate

TABLE – I

S. No.	Specified disability	Medical Authority for the purpose of the issue of disability certificate	Certifying authority to issue certificate of disability
1	In case of amputation or complete permanent paralysis of limbs or dwarfism	Hospitals/ Institutions/ Primary Health Centres run by Central and State Government/ Statutory Local bodies	Any doctor/ medical practitioner working in the Hospitals/ Institutions/ Primary Health Centres run by Government/ Statutory Local bodies.
2	Multiple Disability	District Hospital/ Other hospitals/ Institutions run by Central and State Government /Statutory Local Bodies having relevant medical specialist and testing/assessment facilities	Medical Board consisting of three members of whom two will be specialist dealing with relevant disabilities
3	Specified Disabilities not mentioned in Serial numbers 1 & 2 above	Hospitals / Primary Health Centers / Institutions run by Central and State Government/ Statutory Local bodies having relevant medical specialist and testing / assessment facilities	A specialist dealing with the relevant disability as specified in the Table - II given below

TABLE – II

Sl. No.	Category	Specialist
1	Locomotor disability other than amputation or complete permanent paralysis of limbs and dwarfism	Specialist in Physical Medicine and Rehabilitation or Orthopaedician.
2	Muscular Dystrophy	Specialist in Physical Medicine and Rehabilitation or Orthopaedician.
3	Leprosy cured person	Specialist in Physical Medicine and Rehabilitation or Orthopaedician.
4	Cerebral Palsy	Specialist in Physical Medicine and Rehabilitation or Orthopaedician.
5	Acid Attack Victim	Specialist in Physical Medicine and Rehabilitation or Orthopaedician.
6	Blindness	Specialist in the field of Ophthalmology.
7	Low Vision	Specialist in the field of Ophthalmology.
8	Deaf	Specialist in the field of Ear, Nose, Throat (E.N.T).
9	Hard of Hearing	Specialist in the field of Ear, Nose, Throat (E.N.T).
10	Speech and Language Disabilities	Specialist in the field of Ear, Nose, Throat (E.N.T) and Neurologist.
11	Intellectual Disability	Adults with intellectual disability above the age group of 18 years – Psychiatrist.

12	Specific Learning Disabilities	Medical board consisting of a) Paediatrician; and b) Psychiatrist and Trained Psychologist.
13	Autism spectrum disorder	Medical Board consisting of a) Psychiatrist and Trained psychologist; and b) Paediatrician or General Physician.
14	Mental Illness	Psychiatrist.
15	Chronic Neurological Conditions such as Multiple Sclerosis and Parkinson's Disease	Medical Board consisting of a) Psychiatrist and Trained Psychologist; and b) Neurologist; and c) Orthopaedician or Specialist in Physical Medicine and Rehabilitation.

2.4.2. In case the certificate is issued by a medical authority who is not a Government servant, it shall be valid only if countersigned by the Joint Director, Medical Services.

2.4.3. The disability claimed in the online application, shall be exactly the same as stated in the Disability Certificate. Any discrepancy in this regard shall result in rejection of claim after due process.

2.4.4. Claim as person with benchmark disability, unsupported by the prescribed documents shall result in rejection of claim after due process.

3. Destitute Widow:

3.1. "Destitute Widow" means a widow whose total monthly income from all sources shall not be more than Rs.4,000/-(Rupees Four Thousand only), including any family pension or other receipts including income from private practice in the case of professionals. Destitute Widow shall not include a divorcee or a woman deserted by her husband. The status of an individual as Destitute Widow is with reference to the date of notification.

3.2. Fee Concession: Full exemption.

3.3.Reservation of Appointments: The rule of reservation of appointment to Destitute Widow candidates will not apply to this recruitment.

3.4. Supporting Documents:

3.4.1. The Destitute Widows should upload a certificate from the Revenue Divisional Officer or the Assistant Collector or the Sub-Collector concerned, in the format prescribed below. Failure to upload such certificate or uploading of a widow or divorcee certificate, at the time of submission of online application, shall result in rejection of claim after due process.

Form of Destitute Widow Certificate

1. Name of the individual
2. Full Postal Address
3. Details of job held, if any:
4. Particulars of her children, if any
5. Name and last occupation of her late husband
6. Date of demise of her husband
7. Monetary benefits received after her husband's death by way of family pension, insurance, etc., if any
8. Details of Properties if any immovable and movable left behind by him

9. Present monthly income

- a. From salaries/wages
- b. From family pension
- c. From private properties
- d. Rents received
- e. From private practice
- f. Other sources, if any
- g. Total

10. Whether living alone or living with her husband's parents / in-laws / parents / brother(s)

11. Whether she satisfies the definition of the term "Destitute Widow" as defined in section 20(8) and 26 of Tamil Nadu Government Servants (Conditions of Service) Act, 2016.

Certified that I have verified the particulars furnished by the individual and satisfied myself as to the correctness of her claim with reference to the definition of the term – "Destitute Widow" in section 20(8) and 26 of Tamil Nadu Government Servants (Conditions of Service) Act, 2016.

Certificate Reference No.:

Signature:

Place:

Name:

Date:

Designation:

Revenue Divisional Officer / Assistant Collector / Sub-Collector

Explanation - The above certificate should be issued only by the Revenue Divisional Officer or the Assistant Collector or the Sub-Collector concerned.

3.4.2. A 'Widow Certificate' is different from a 'Destitute Widow Certificate'. Candidates who have uploaded Widow Certificates will not be considered as Destitute Widow.

3.4.3. Claim as Destitute Widow shall be admitted only if the date of demise of husband is on or before the date of notification.

3.4.4. Any correction in the Destitute Widow certificate must be attested by the issuing authority or a fresh certificate in lieu thereof must be uploaded.

4. Person Studied in Tamil Medium (PSTM):

4.1. "Person Studied in Tamil medium" means a person who has studied through Tamil medium of instruction up to the educational qualification prescribed for direct recruitment in the rules or regulations or orders applicable to any appointment in the services under the State.

4.1.1. In cases where a Degree is prescribed as the educational qualification, one shall have studied from first standard to Degree through Tamil medium of instruction.

4.1.2. The candidates who did not join school in the 1 st standard, but joined schools directly in 2nd standard to 8th standard, studied in Tamil as the medium of instruction and passed, and those who studied with Tamil as the medium of instruction in other states and then continued their education in Tamil Nadu from the standard they entered are also eligible.

4.1.3. Students who have studied in Tamil medium in regular stream in 10th, 11th and 12th standard and failed to pass one or more subjects in them, but have later passed in the subject as private students and have continued to study in schools and colleges in Tamil medium and have passed are eligible to be considered under PSTM category.

4.1.4. The candidates who have passed the examination through Tamil medium directly as private candidates without going to school are not eligible to be considered under PSTM category.

4.2. Supporting Documents:

4.2.1. Candidates claiming to be Persons Studied in Tamil Medium (PSTM) must upload evidence for the same, in the form of SSLC, HSC, Transfer Certificate, Provisional Certificate, Convocation Certificate, Degree Certificate, PG Degree Certificate, Mark Sheets, Certificate from the Board or University or from the Institution, as the case may be, with a recording that he had studied the entire duration of the respective course(s) through Tamil medium of instruction.

4.2.2. The candidates should obtain certificates of education in Tamil medium from all the relevant educational institutions where they studied up to the prescribed educational qualification. Candidates must upload documents as evidence of having studied in the Tamil medium, all educational qualifications from 1st standard up to the educational qualification prescribed.

4.2.3. If no such document as evidence for 'Person Studied in Tamil Medium' is available, a certificate from the Principal / Head Master / District Educational Officer / Chief Educational Officer / Director , Directorate of Government Examinations / Competent Authority, Principal / Registrar of Industrial Training Institute / College / University as the case may be, in the format as shown below, must be uploaded for each and every educational qualification, from 1st standard up to the educational qualification prescribed.

4.2.4. Failure to upload such documents as evidence for 'Persons Studied in Tamil Medium' for all educational qualification up to the educational qualification prescribed, shall result in the rejection of claim after due process.

4.2.5. Documents uploaded as proof of having studied in Tamil medium, for the partial duration of any course, shall not be accepted and shall result in the rejection of claim after due process.

Certificate for having studied in Tamil Medium*

This is to certify that Thiru./Tmt./Selvi.(Name) had studied Classes to with Tamil as the medium of instruction, in this school / through Private Studies during the year to and had satisfactorily completed the course of studies prescribed for Classes to

Thiru./Tmt./Selvi.(Name) was / was not awarded scholarship meant for students studying in the Tamil medium.

This certificate is issued with reference to Section 2(d) of the PSTM (Amendment) Act, 2020, based on the verifiable documentary evidence. The undersigned assumes full responsibility for the veracity of the contents herein.

Signature of Principal / Head Master /
District Educational Officer /
Chief Educational Officer /
Director, Directorate of Govt. Exams /
Competent Authority

Place:

Date:

Seal of the Institution

(Mobile No. _____)

* If the candidate has studied in different schools from 1st std. up to 10th std./ 12th std., then the above certificate shall be obtained from each of the schools the candidate has studied in.

Certificate for having studied in Tamil Medium*

This is to certify that Thiru / Tmt. / Selvi.(Name) had studied.....
(Diploma / Degree / PG Degree, etc.) during the year to with Tamil as the medium
of instruction and had satisfactorily completed the course of studies prescribed for.....(Diploma
/ Degree / PG Degree, etc.).

Thiru / Tmt. / Selvi.(Name) was / was not awarded scholarship meant for
students studying in the Tamil medium.

This certificate is issued with reference to Section 2(d) of the PSTM (Amendment) Act, 2020, based on
the verifiable documentary evidence. The undersigned assumes full responsibility for the veracity of the
contents herein.

Signature of Principal /
Registrar Industrial Training Institute /
College / University

Place:

Date:

Seal of the Institution

(Mobile No.)

* If the candidate has completed different courses in different Institutions, such a certificate shall be
obtained from each of these Institutions for the courses completed therein.

5. Scheduled Castes, Scheduled Caste (Arunthathiyars) and Scheduled Tribes:

5.1. "Scheduled Castes" means the communities given in the Annexure to the "Instructions to Applicants"
[extracted from Part-A of Schedule-II of the Tamil Nadu Government Servants (Conditions of Service)
Act, 2016].

5.2. 'Arunthathiyar' means the castes: Arunthathiyar, Chakkiliyan, Madari, Madiga, Pagadai, Thoti and
Adi Andhra.

5.3. "Scheduled Tribes" means the communities given in the Annexure to the "Instructions to Applicants"
[extracted from Part-B of Schedule-II of Tamil Nadu Government Servants (Conditions of Service) Act,
2016.

Note: Persons belonging to Tamil Nadu and to any one of the communities mentioned in the lists shown
in the Annexure to the "Instructions to Applicants" alone shall be treated as Scheduled Castes or
Scheduled Tribes as the case may be. Persons belonging to other States shall not be treated as
belonging to the Scheduled Castes or Scheduled Tribes even though they may belong to any one of the
communities specified in the list.

5.4. Fee Concession: Full exemption

5.5. **Reservation of Appointments:** The selection will be made following the rule of reservation of
appointments for Scheduled Castes / Scheduled Caste (Arunthathiyars) / Scheduled Tribes.

Scheduled Caste (SC)	15%
Scheduled Caste (Arunthathiyar) (SCA)	3%
Scheduled Tribe (ST)	1%

5.6. Supporting Documents:

5.6.1. The Scheduled Caste (Arunthathiyars) and Scheduled Castes candidates should produce the Community certificate, citing either father's / mother's name, issued by Taluk Tahsildar, in whose jurisdiction the candidate claims to have permanent residence.

5.6.2. The Scheduled Tribe candidates should produce the Community certificate, citing either father's / mother's name, issued by the Revenue Divisional Officer / Assistant Collector / Sub-Collector / Personal Assistant (General) to the Collector of Chennai / District Adi-Dravidar Welfare Officer, in whose jurisdiction the candidate claims to have permanent residence.

5.6.3. Candidates belonging to Scheduled Tribe communities must upload the report of the State Level Scrutiny Committee (SLSC), if available. Failure to do so would render their claim liable to verification by the State Level Scrutiny Committee.

5.6.4. Uploading of a community certificate citing name of the spouse, shall result in rejection of claim after due process.

5.6.5. The certificate obtained by the candidates in the form other than the one referred to in G.O. Ms. No.781, Revenue Department, dated 2nd May 1988 and solely based on the entries in SSLC or Transfer Certificate or other school / college records will not be accepted.

5.6.6. Candidates are warned that if the community recorded in the certificate produced by them from the competent authority is not included in the list of Scheduled Castes, Scheduled Caste (Arunthathiyars), Scheduled Tribes, given in the Annexure to the "Instructions to Applicants" [extracted from the Tamil Nadu Government Servants (Conditions of Service) Act, 2016], they will not be permitted to claim to belong to Scheduled Castes, Scheduled Caste (Arunthathiyars), Scheduled Tribes, as the case may be. They will, in that case, be permitted to claim to belong to 'Others' category only.

5.6.7. Candidates belonging to Scheduled Castes, on conversion to religions other than Christianity / Islam, shall be treated as 'Others'. However, Scheduled Caste converts to Sikhism and Buddhism shall be treated as Scheduled Castes.

5.6.8. Failure to upload the supporting documents, when called for shall result in the rejection of claim after due process.

6. Backward Classes:

6.1. "Backward Classes" means the communities specified as Backward Classes, Backward Class Muslims, Most Backward Classes / Denotified Communities given in the Annexure to the "Instructions to Applicants" [extracted from Parts A, B, C and D respectively, of Schedule-I of the Tamil Nadu Government Servants (Conditions of Service) Act, 2016].

6.2. Explanation - Persons who belong to the State of Tamil Nadu alone, who belong to one of the communities specified in Schedule-I, of the Tamil Nadu Government Servants (Conditions of Service) Act, 2016 shall be treated as persons who belong to one of such communities.

6.3. Fee Concession: Three Free Chances

6.4. Reservation of Appointments: The selection will be made following the rule of reservation of appointments for Backward Classes (Muslim), Backward Classes, Most Backward Classes and Denotified Communities.

Backward Class (BC)	26.5%
Backward Class (Muslim) [BC (M)]	3.5%
Most Backward Class / Denotified Communities (MBC / DC)	20.0%

6.5. Supporting Documents:

6.5.1. The candidates belonging to Backward Classes (Muslim), Backward Classes, Most Backward Classes and Denotified Communities should produce the Community certificate, citing either father's / mother's name, issued by Revenue Officer not lower in rank than a Tahsildar or Head Quarters Deputy Tahsildar or Special Deputy Tahsildar appointed to issue Community Certificate or Deputy Tahsildar (School Certificates) or Executive Deputy Tahsildar (in respect of Chennai district) or Additional Head Quarters Deputy Tahsildar or Zonal Deputy Tahsildar, in whose jurisdiction the candidate claims to have permanent residence.

6.5.2. The candidates belonging to Thottia Naicker (including Rajakambalam, Gollavar, Sillavar, Thockalavar, Thozhuva Naicker, and Erragollar) included in the list of MBC / DC should produce the Community certificate, citing either father's / mother's name, issued by Head Quarters Deputy Tahsildar/ Zonal Deputy Tahsildar, in whose jurisdiction the candidate claims to have permanent residence.

6.5.3. Uploading of a community certificate citing name of the spouse, shall result in rejection of claim after due process.

6.5.4. The certificate obtained by the candidates in the form other than the one referred to in G.O. Ms. No.781, Revenue Department, dated 2nd May 1988 and solely based on the entries in SSLC or Transfer Certificate or other school / college records will not be accepted.

6.5.5. Candidates are warned that if the community recorded in the certificate produced by them from the competent authority is not included in the list of Backward Classes (Muslim), Backward Classes, Most Backward Classes / Denotified Communities, given in the Annexure to "Instructions to Applicants" [extracted from the Tamil Nadu Government Servants (Conditions of Service) Act, 2016], they will not be permitted to claim to belong to Most Backward Classes / Denotified Communities, Backward Classes (other than Muslim) or Backward Classes (Muslim), as the case may be. They will, in that case, be permitted to claim to belong to 'Others' category only.

6.5.6. Candidates belonging to Backward Classes, Most Backward Classes / Denotified Communities on conversion to religions other than Christianity / Islam, shall be treated as 'Others'.

6.5.7. Failure to upload the supporting documents, when called for shall result in the rejection of claim after due process.

7. Women:

7.1. Reservation of Appointments: A minimum of 30% of all vacancies shall be set apart for women candidates, irrespective of the fact of whether the rule of reservation of appointments applies to the posts or not. In respect of the posts to which the rule of reservation of appointments applies, 30% of vacancies shall be set apart for women candidates, following the reservation for each communal category as well as open category. Women / Transgender (women) candidates shall be entitled to compete for the said 30% of vacancies. They shall also be entitled to compete for the remaining 70% of vacancies along with male / Transgender / Transgender (men) candidates.

7.2. Supporting Documents: Gender claimed shall be verified against the Transfer Certificate / Community Certificate. Failure to upload the supporting documents at the time of submission of online application shall result in the rejection of candidature after due process.

8. Transgender:

8.1. Supporting Documents:

8.1.1. Transgender / Transgender (Male) / Transgender (Female) candidates should produce the Transgender ID card issued only by the Tamil Nadu Transgender Welfare Board.

8.1.2. Uploading of Transgender ID card, issued by any authority other than the Tamil Nadu Transgender Welfare Board shall result in rejection of candidature after due process.

8.1.3. Transgender or Transgender (Male) or Transgender (Female) claim made in the online application must correspond to what is stated in the Transgender ID card. Any discrepancy in this regard shall result in rejection of candidature after due process.

8.1.4. Gender claim unsupported by the requisite documents shall result in rejection of claim after due process.

8.2. Community:

8.2.1. Transgender candidates, who do not possess any community certificate may choose to be considered under 'Others' or under Most Backward Classes.

8.2.2. Transgender candidates who belong to Scheduled Caste / Scheduled Caste (Arunthathiyar) / Scheduled Tribe communities and possess community certificate as such, shall be considered as per their respective community.

8.2.3. Transgender candidates who belong to communities other than Scheduled Caste / Scheduled Caste (Arunthathiyar) / Scheduled Tribe and possess community certificate as such, are permitted to choose to be considered as belonging to their own community or as Most Backward Class, whichever is advantageous to them, at the time of One Time Registration itself. Once the individual opts to be considered as a particular community, it shall be crystallized and this option shall not be changed in the future.

8.2.4. Transgender candidates who do not possess a community certificate and have chosen to be considered under 'Most Backward Classes' or 'Others' and those in possession of a community certificate as Backward Classes / Backward Classes (Muslim) / Denotified Communities but have chosen to be considered under 'Most Backward Classes', need not upload a community certificate in support of their claim.

8.2.5. Transgender candidates, in possession of a community certificate and who have chosen to be considered under the communal reservation category as stated in the community certificate, must upload the same. Failure to upload such a certificate shall result in rejection of candidature after due process.

8.2.6. All concessions permitted to Transgender candidates in the matter of choice of communal reservation category, shall be wholly dependent on the uploading of a Transgender ID card issued by the Tamil Nadu Transgender Welfare Board. Failure to upload the same or uploading of a Transgender ID card issued by other authorities, shall result in rejection of candidature after due process.

Annexure III
Syllabus
Paper I
Part A - Tamil Eligibility Test
(SSLC Standard – 100 Questions)

Code: 503

அலகு I: இலக்கணம் (25 கேள்விகள்)

எழுத்து: பிரித்து எழுதுதல் - சேர்த்து எழுதுதல் - சந்திப்பிழை - குறில், நெடில் வேறுபாடு - லகர, ளகர, முகர வேறுபாடு - ணகர, ணகர வேறுபாடு - ரகர, றகர வேறுபாடு - இனவெழுத்துகள் அறிதல் - சுட்டு எழுத்துகள் - வினா எழுத்துகள் - ஒருமைப் பன்மை அறிதல்.

சொல்: வேர்ச்சொல் அறிதல் - வேர்ச்சொல்லில் இருந்து வினைமுற்று, வினையெச்சம், வினையாலணையும் பெயர், பெயரெச்சம் வகை அறிதல் - அயற்சொல் தமிழ்ச்சொல், எதிர்ச்சொல் வினைச்சொல் - எழுத்துப் பிழை, ஒற்றுப்பிழை அறிதல் - இரண்டு வினைச் சொற்களின் வேறுபாடு அறிதல்.

அலகு II: சொல்லகராதி (15 கேள்விகள்)

(i) எதிர்ச்சொல்லை எடுத்தெழுதுதல், ஒரெழுத்து ஒரு மொழி, உரிய பொருளைக் கண்டறிதல் - ஒருபொருள் தரும் பல சொற்கள், பொருந்தா சொல்லைக் கண்டறிதல், அகர வரிசைப்படி சொற்களைச் சீர்செய்தல்; ஒருபொருள் பன்மொழி - இருபொருள் குறிக்கும் சொற்கள் - பேச்சு வழக்கு, எழுத்து வழக்கு - சொல்லும் பொருளும் அறிதல் - ஒரு சொல்லிற்கு இணையான வேறு சொல் அறிதல்.

(ii) கோடிட்ட இடத்தில் சரியான சொல்லைத் தேர்ந்தெடுத்து எழுதுதல் - (எ.கா.) பள்ளிக்குச் சென்று கல்வி பயிலுதல் சிறப்பு (பயிலுதல், எழுதுதல்) - வானில் முகில் தோன்றினால் மழை பொழியும் (முகில், நட்சத்திரம்); பொருத்தமான பொருளைத் தெரிவு செய்தல் - (எ.கா.) ஊடகம் - தகவல் தொடர்புச் சாதனம் (செய்தி, தகவல் தொடர்புச் சாதனம்) - சமூகம் - மக்கள் குழு (மக்கள் குழு கூட்டம்); ஊர்ப் பெயர்களின் மரபு உவை எழுதுக - (எ.கா) புதுச்சேரி - புதுவை, மன்னார்குடி - மண்ணை, மயிலாப்பூர் - மயிலை; பிழை திருத்துக (எ.கா) ஒரு - ஓர் பேச்சு வழக்குச் சொற்களுக்கு இணையான தூய தமிழ்ச் சொற்களை இணைத்தல் - (எ.கா) வெத்தில - வெற்றிலை, நாக்காலி நாற்காலி.

(iii) பேச்சு வழக்குத் தொடர்களிலுள்ள பிழை திருத்தம் - (எ.கா.) நேத்து மழ பேஞ்சது - நேற்று மழை பெய்தது; சொற்களை இணைத்துப் புதிய சொல் உருவாக்குதல்: மற்றும், அல்லது, ஆல், பிறகு வரை, இதுவுமல்ல, இருப்பினும், எனினும், இதனால்: அடைப்புக்குள் உள்ள சொல்லைத் தகுந்த இடத்தில் சேர்த்தல் - (எனவே, ஏனெனில், ஆகையால், அதுபோல, அதனால், வரை, பின்பு) - (எ.கா) நான் காட்டிற்குச் சென்றேன். அதனால் புலியைப் பார்த்தேன் - மாலைநேரம் முடியும் வரை விளையாடுவேன். தேர்வு முடிந்த பின்பு சுற்றுலா செல்லலாம்: பொருள் தரும் ஓர் எழுத்து - (எ.கா) ஆ-பசு, ஈ-கொடு, தை-மாதம், தீ-நெருப்பு; பல பொருள் தரும் ஒரு சொல்லைக் கூறுக - (எ.கா) கமலம், கஞ்சம், முளரி, பங்கயம் இச்சொற்கள் தாமரையைக் குறிக்கும்.

அலகு III: எழுதும் திறன் (15 கேள்விகள்)

(i) சொற்களை ஒழுங்குபடுத்திச் சொற்றொடர் அமைத்தல் - தொடர் வகைகள் - செய்வினை, செயப்பாட்டு வினை - தன்வினை, பிறவினை - ஒருமைப் பன்மை பிழையறிந்து சரியான தொடரறிதல்.

(ii) மரபுத் தமிழ்: திணை மரபு - உயர்திணை: அம்மா வந்தது - அம்மா வந்தாள்: அஃறிணை: மாடுகள் நனைந்தது - மாடுகள் நனைந்தன: பால் மரபு: ஆண்பால்: அவன் வந்தது - அவன் வந்தான்: பெண்பால்: அவள் வந்தது - அவள் வந்தாள்: பலர் பால்: அவர்கள் வந்தார்கள் - அவர்கள் வந்தனர்: ஒன்றன் பால்: அது வந்தன - அது வந்தது: பலவின் பால்: பறவைகள் பறந்தனர் - பறவைகள் பறந்தன: காலம்: நேற்று மழை பெய்யும் - நேற்று மழை பெய்தது: நேற்று வருவேன் - நேற்று வந்தேன்: இளமைப் பெயர்: பசு - கன்று: ஆடு - குட்டி: ஒலிமரபு: நாய் கத்தியது - நாய் குரைத்தது: வினைமரபு: கூடைமுடை, சோறு உண்: தொகை மரபு: மக்கள் கூட்டம் - ஆட்டு மந்தை, நிறுத்தல் குறியீடுகள்: கால்புள்ளி, அரைப் புள்ளி, முக்கால் புள்ளி, முற்றுப் புள்ளி, வியப்புக் குறி, வினாக்குறி அமையும் இடங்கள்.

அலகு IV: கலைச் சொற்கள் (10 கேள்விகள்)

பல்துறை சார்ந்த கலைச் சொற்களை அதாவது அறிவியல், கல்வி, மருத்துவம், மேலாண்மை, சட்டம், புவியியல், தொழில்நுட்பம், ஊடகம், தகவல் தொழில்நுட்பம் உள்ளிட்ட பல்துறை சார்ந்த கலைச் சொல்லுக்கு நேரான தமிழ்ச் சொற்களை அறிந்திருக்க வேண்டும். (உதாரணம்: search engine - தேடு பொறி, வலசை - Migration, ஒவ்வாமை - Allergy, மரபணு - Gene, கடல் மைல் - Nautical Mile).

அலகு V: வாசித்தல் - புரிந்து கொள்ளும் திறன் (15 கேள்விகள்)

கொடுக்கப்பட்ட பத்தியிலிருந்து கேட்கப்பட்ட வினாக்களுக்கு சரியான விடையைத் தேர்ந்தெடுத்தல் - செய்தித்தாள் - தலையங்கம் - முகப்புச் செய்திகள் - அரசு சார்ந்த செய்திகள் - கட்டுரைகள் - இவற்றை வாசித்தல் - புரிந்து கொள்ளும் திறன் - உவமைத் தொடரின் பொருளறிதல் - மரபுத் தொடரின் பொருளறிதல் - பழமொழிகள் பொருளறிதல் - ஆவண உள்ளடக்கங்களைப் புரிந்து கொள்ளும் திறன்.

அலகு VI: எளிய மொழி பெயர்ப்பு (5 கேள்விகள்)

ஆங்கிலம் மற்றும் பிறமொழிச் சொற்களுக்கு இணையான தமிழ்ச் சொற்கள் அறிதல் வேண்டும் - பயன்பாட்டில் உள்ள ஆங்கிலச் சொற்களை மொழிபெயர்த்தல் வேண்டும் (சான்று: pendrive, printer, computer, keyboard) - ஆவணங்களின் தலைப்பு - கோப்புகள் - கடிதங்கள் - மனுக்கள் - மொழிபெயர்ப்பு புரிந்து கொள்ளுதல்.

அலகு VII: இலக்கியம், தமிழ் அறிஞர்களும், தமிழ்த்தொண்டும் (15 கேள்விகள்)

திருக்குறள் தொடர்பான செய்திகள் (இருபது அதிகாரங்கள் மட்டும்) ஒழுக்கமுடைமை, பொறையுடைமை, ஊக்கமுடைமை, விருந்தோம்பல், அறன் வலியுறுத்தல், ஈகை, பெரியாரைத் துணைக்கோடல், வினை செயல்வகை, அவையஞ்சாமை, கண்ணோட்டம், அன்புடைமை, கல்வி, நடுநிலைமை, கூடா ஒழுக்கம், கல்லாமை, செங்கோன்மை, பண்புடைமை, நட்பாராய்தல், புறங்கூறாமை, அருளுடைமை - மேற்கோள்கள் - அறநூல் தொடர்பான செய்திகள் (நாலடியார், நான்மணிக்கடிகை, பழமொழி நானூறு, முதுமொழிக்காஞ்சி, திரிகடுகம், இன்னாநாற்பது, சிறுபஞ்சமூலம், ஏலாதி, அவ்வையார் பாடல்கள்) - தமிழின் தொன்மை, சிறப்பு, திராவிட மொழிகள் தொடர்பான செய்திகள் - உ.வே.சாமிநாத ஐயர், தெ.பொ.மீனாட்சி சுந்தரம், சி.இலக்குவனார் தமிழ்ப்பணி தொடர்பான செய்திகள் - தேவநேய பாவாணர், அகரமுதலி, பாவலரேறு பெருஞ்சித்திரனார், ஜி.யு. போப், வீரமாமுனிவர் தமிழ்த் தொண்டு தொடர்பான செய்திகள் - தமிழ்ச் சான்றோர் பற்றிய செய்திகள்: பாவேந்தர், டி.கே.சிதம்பரனாதர், தவத்திரு குன்றக்குடி அடிகளார், கண்ணதாசன், காயிதே மில்லத், தாரா பாரதி, வேலுநாச்சியார், பட்டுக்கோட்டைக் கல்யாணசுந்தரம், முடியரசன், தமிழ் ஒளி உருத்திரங்கண்ணனார், கி.வா.ஜகந்தாதர், நாமக்கல் கவிஞர்.

PART B: GENERAL STUDIES (DEGREE STANDARD)

UNIT I: GENERAL SCIENCE (5 Questions)

Scientific knowledge and scientific temper - Power of reasoning - Rote learning vs conceptual learning - Science as a tool to understand the past, present, and future; Nature of universe - General scientific laws – Mechanics - Properties of matter, force, motion, and energy - Everyday application of the basic principles of mechanics, electricity and magnetism, light, sound, heat, nuclear physics, laser, electronics, and communications; Elements and compounds, acids, bases, salts, petroleum products, fertilizers, pesticides; Main concepts of life science, classification of living organisms, evolution, genetics, physiology, nutrition, health and hygiene, human diseases; Environment and ecology; Latest inventions in science and technology; Current affairs.

UNIT II: GEOGRAPHY OF INDIA (5 Questions)

Location - Physical features - Monsoon, rainfall, weather and climate - Water resources - Rivers in India - Soil, Minerals and Natural Resources - Forest and Wildlife - Agricultural pattern; Transport – Communication; Social Geography – Population density and distribution - Racial, linguistic groups and major tribes; Natural calamity - Disaster management; Environmental pollution - Reasons and preventive measures - Climate change - Green energy; Geographical landmarks; Current affairs.

UNIT III: HISTORY, CULTURE OF INDIA, AND INDIAN NATIONAL MOVEMENT (10 Questions)

Indus Valley Civilization - Guptas, Delhi Sultans, Mughals, and Marathas - Age of Vijayanagaram and Bahmani Kingdoms - South Indian History; National Renaissance - Early uprising against British rule - Indian National Congress - Emergence of leaders – B.R.Ambedkar, Bhagat Singh, Bharathiar, V.O.Chidambaranar, Jawaharlal Nehru, Kamarajar, Mahatma Gandhi, Maulana Abul Kalam Azad, Thanthai Periyar, Rajaji, Subash Chandra Bose, Rabindranath Tagore, and others; Different modes of agitation: Growth of Satyagraha and Militant Movements; Communalism and Partition; Change and continuity in the socio-cultural history of India; Characteristics of Indian Culture, Unity in Diversity – Race, Language, Custom; India as a secular state, Social harmony; Prominent personalities in various spheres – Arts, Science, Literature and Philosophy.

UNIT IV: INDIAN POLITY (15 Questions)

Constitution of India - Preamble to the Constitution - Salient features of the Constitution - Union, State and Union Territory - Citizenship, Fundamental Rights, Fundamental Duties, Directive Principles of State Policy - Union Executive, Union Legislature - State Executive, State Legislature - Local Governments, Panchayat Raj - Spirit of federalism: Centre - State relationships - Election - Judiciary in India – Rule of Law - Corruption in public life – Anti-corruption measures - Lokpal and Lok Ayukta - Right to Information - Empowerment of Women - Consumer Protection Forums, Human Rights Charter; Political parties and political system in India; Current affairs.

UNIT V: INDIAN ECONOMY AND DEVELOPMENT ADMINISTRATION IN TAMIL NADU (20 Questions)

Nature of Indian Economy – Five-year plan models - an assessment - Planning Commission and Niti Aayog; Sources of revenue - Reserve Bank of India - Fiscal Policy and Monetary Policy - Finance Commission - Resource sharing between Union and State Governments - Goods and Services Tax; Structure of Indian Economy and Employment Generation, Land Reforms and Agriculture - Application of Science and Technology in Agriculture - Industrial growth - Rural welfare oriented programmes - Social problems - Population, Education, Health, Employment, Poverty; Human Development Indicators in Tamil Nadu and a comparative assessment across the Country – Impact of social reform movements in the socio-economic development of Tamil Nadu - Political parties, and welfare schemes for various sections of people - Rationale behind the reservation policy, and access to the social resources - Economic trends in Tamil Nadu - Role and impact of social welfare schemes in the socio-economic development of Tamil Nadu - Social Justice and social harmony as the cornerstones of socio-economic development; Education and health systems in Tamil Nadu; Geography of Tamil Nadu and its impact on economic growth; Achievements of Tamil Nadu in various fields; e-Governance in Tamil Nadu; Public awareness and General administration - Welfare oriented Government schemes and their utility, Problems in public delivery systems; Current socio-economic issues; Current affairs.

UNIT VI: HISTORY, CULTURE, HERITAGE, AND SOCIO-POLITICAL MOVEMENTS IN TAMIL NADU (20 Questions)

History of Tamil Society, related archaeological discoveries, Tamil literature from Sangam age till contemporary times - Thirukkural - Significance as a secular literature - Relevance to everyday life, Impact of Thirukkural on humanity, Thirukkural and universal values - Relevance to Socio-politicoeconomic affairs, Philosophical content in Thirukkural; Role of Tamil Nadu in freedom struggle - Early agitations against British Rule - Role of women in freedom struggle; Evolution of 19th and 20th century socio-political movements in Tamil Nadu - Justice Party, Growth of Rationalism - Self Respect Movement, Dravidian Movement, and principles underlying both these movements; Contributions of Thanthai Periyar and Perarignar Anna.

PART C: APTITUDE AND MENTAL ABILITY (SSLC STANDARD)

UNIT I: APTITUDE (15 Questions)

Simplification - Percentage - Highest Common Factor (HCF) - Lowest Common Multiple (LCM) - Ratio and Proportion - Simple interest - Compound interest - Area - Volume - Time and Work.

UNIT II: REASONING (10 Questions)

Logical reasoning - Puzzles - Dice - Visual reasoning - Alpha numeric reasoning - Number series.

Paper II - Subject Paper

1. Animal Husbandry and Veterinary Science (Degree Standard)

Code: 396

UNIT I: GENERAL (20 Questions)

Livestock Population Census in the nation and state, - Role of livestock and their products in the Indian economy and human health, current livestock programs and policies of State and Nation Policy note on Animal Husbandry, Government of Tamil Nadu – Economics of dairy, sheep, goat, poultry, pig and rabbit farming; Livestock project preparation, constraints to the livestock development programs, common offenses against animals – SPCA, Animal Welfare Board of India, NGOs. Livestock marketing and Livestock entrepreneurship.

UNIT II: LIVESTOCK PRODUCTION MANAGEMENT (20 Questions)

Common terms used in Animal Husbandry – Dentition and ageing of animals – Livestock and poultry breeds and breed characters, housing systems for different classes of livestock, and requirements of space, ventilation, water, sanitation, and waste disposal. Management of milk, meat, egg, and wool-producing livestock, management of calves and heifers, management of breeding bulls, draught animal power, rearing buffaloes for meat, organic livestock production, small ruminant production systems, economic traits of cattle, sheep and goat. Farm records and their maintenance, strategies for livestock improvement for enhancing productivity. Systems of swine production in India, Exotic and indigenous breeds of pigs, Housing condition requirements for different classes of swine, feeding management for different classes of swine, breeding sow and boar management, piglet management, fattener management. Indian breeds of horses, Equine housing, feeding and breeding management. Importance and significance of laboratory animal production and management, Wild animals in captivity and management.

UNIT III: ANIMAL NUTRITION (20 Questions)

Nutritional terms and definitions – Role of nutrition in health and production- Feeds and fodder classification, composition, anti-nutritional factors, and toxins- Requirements of nutrients for different categories of livestock/poultry and formulation of least cost rations- Feeding of pet animals- BIS specifications for livestock and poultry feeds -Nutritional deficiency and its influence on livestock performance -Feed supplements and additives- Conservation and preservation of feed and fodders - Economic utilization of agro-industrial by-products for feeding livestock – Utilization of unconventional feeds – Feeding of captive wild animals and birds - Quality control of feed - Feed milling technology- Feed block/baling- By-Pass Proteins and by-pass Fat - Feeding livestock during scarcity - Metabolic disorders in Livestock and Poultry- Processing of feeds and forage to improve nutritive value - Use of NPN compounds for ruminants.

UNIT IV: LIVESTOCK BREEDING AND GENETICS (20 Questions)

Important breeds of cattle, buffalo, sheep, goat, pig, and poultry with special reference to economic characters - Principles of Genetics, Cytogenetics, and Basis of Population Genetics, Genetic parameters - Nature of DNA and RNA, their models and functions - Selection of livestock for production, reproduction, and disease resistance traits – Response to selection - Mating systems including Nucleus Breeding Schemes - Current livestock and poultry breeding policies and programs in the state and country - Applications of Recombinant DNA technology, Cloning, Transgenesis, and Marker-Assisted Selection - Conservation of Animal Genetic Resources.

UNIT V: VETERINARY ANATOMY, PHYSIOLOGY AND BIOCHEMISTRY (15 Questions)

Gross study of bones of Ox and differences in Horse, Dog, Pig and Fowl, Joints and Muscles of Skeleton of Ox, Gross study of Heart and Conduction system, General plan of Pulmonary and systemic circulation, Gross anatomy of Brain and Spinal cord, the Gross study of organs of the digestive, respiratory, urinary and reproductive system of Ox, Horse, Dog, Pig and Fowl, Systemic histology.

Mechanism of respiration. General functions of blood (blood cells, plasma & serum) coagulation, cardiac cycle, Blood circulation, Blood pressure, renal function Hormonal control of Lactogenesis. Environmental

factors affecting animal production – Environmental stress on animal performance – Green Houses Gases – Role of ruminants. Endocrine System-Functional aspects of hormones in Systemic Physiology. Renal system-Counter Current Mechanism-AcidBase Balance.

Enzymes: Definition and classification. Clinical Enzymology - Diagnostic importance of non-functional plasma enzymes and Isoenzymes; Carbohydrate metabolism and its disorders: Glycolysis, Krebs cycle, Carbohydrate fermentation pathway. Disorders - Diabetes mellitus, Bovine Ketosis, Pregnancy toxemia, Lactic acidosis and Bloat in ruminants; Lipid metabolism and its disorders: Beta oxidation of fatty acids, ketone body formation, Disorders- Bovine Ketosis, Pregnancy toxemia; Lipid Profile in disease diagnosis; Protein metabolism and its disorders: Urea cycle and Urea poisoning in ruminants. Utilization of NPN compounds by ruminants; Organ Function tests: Liver function and Renal function tests - Biochemical tests for differential diagnosis.

UNIT VI: VETERINARY MICROBIOLOGY, PUBLIC HEALTH AND PREVENTIVE MEDICINE

(30 Questions)

General and Systematic Veterinary Bacteriology – Bacterial Diseases of Veterinary Importance in relation to Isolation, Culture, Morphology, Biochemical and Antigenic Characteristics, Pathogenesis, Diagnosis, and control. Veterinary Mycology – Important Pathogenic Fungi in relation to Isolation, Culture, Morphology, Biochemical and Antigenic Characteristics, Pathogenesis, Diagnosis, Prevention, and Control. General and Systematic Veterinary Virology – Structure, Viral Replication, Viral Pathogenesis, Viral Interaction, and Oncogenesis – Important Veterinary Viral Diseases – RNA and DNA Viruses, Cultivation, Pathogenesis, Clinical Sciences, and Diagnosis. Veterinary Immunology – Antigen – Types of Immunity, Antigen and Antibody, Concepts of Immunity and Microbes, Vaccine and other Biologicals – Antigen and Antibody-based Diagnostic Test and Microbial Biotechnology.

Epidemiology – definitions, terms, triad, concept, scope, objectives, and uses. Monitoring and surveillance, epidemiological disciplines, methods, mode and route of disease transmission, rates, ratios, the occurrence of disease, properties of diagnostic tests, the gradient of infection, and pattern of diseases. Epidemiology, treatment, prevention, and control of common bacterial, viral, fungal, rickettsial, protozoan, ectoparasitic and endoparasitic diseases() of livestock, poultry, companion animals, and wildlife species, regional - emerging and re- emerging important diseases. Allergic skin tests, modern diagnostic techniques, and vaccination protocol for infectious diseases.

Role of Veterinarians in public health, one health concept - Milk Hygiene, Meat Hygiene - Foodborne diseases and Food Safety, Zoonoses - Classification, Zoonotic diseases of bacterial, viral, fungal, parasitic and rickettsial origin - Prevention and control of Zoonotic Diseases - Emerging and Re-Emerging Zoonoses -Biodiversity -Environmental contaminants in the food chain - Air, water, Thermal, radiation and land pollution - water purification, Chlorination - Sanitation and disinfection of farm and hospital - Management of waste from animal industries - Role of Pollution Control Board in India - Disaster Management - Vector control and reservoir control.

UNIT VII: PATHOLOGY, PARASITOLOGY AND PHARMACOLOGY (20 Questions)

General concepts and etiology of diseases in animals; Common pathological conditions seen in domestic, wild, zoo, and laboratory animals and birds. Veterinary clinical pathology methods (with special reference to hematology, urinalysis, biopsy, and cytology) as rapid diagnostic methods. General oncology and pathology of various types of tumors in domestic animals. General principles and procedures of necropsy; Collection, preservation, and dispatch of morbid materials for laboratory diagnosis; Veterinary legal necropsy procedures.

Classification of Parasites – Parasite and parasitism in animals; important morphological features, life-cycles, mode of transmission, pathogenesis, diagnosis, chemotherapy, prophylaxis, and general control measures of parasites associated with disease in animals, birds, captive and free range wild animals.

Drug action – Pharmacokinetics (absorption, distribution, metabolism, and excretion), Pharmacodynamics – (types and structure of receptors. Dose-response curve)- Anaesthetics(local and general), analgesics, sedatives – drugs for euthanasia of animals - Chemotherapy(general principles including resistance, antibacterials, anthelmintics, antiprotozoals) –Toxicology (toxicity of pesticides, herbs, venoms, and toxins) –pharmacy (pharmaceutical calculations, prescription writing) – useful herbal preparations.

UNIT VIII: EXTENSION EDUCATION (10 Questions)

Farming and types of farming in India. Early extension efforts in India. Extension Education – Principles, philosophy, objectives, dimensions. Extension Educational Process. Teaching and learning process.

Rural development programs. Panchayati Raj. Sociology and Rural sociology in animal husbandry extension – culture, tribal, rural and urban communities, social control, social stratification, social institutions, social change, leadership. Adoption and diffusion of innovations – innovation-decision process, attributes of innovations, adopter categories, factors affecting adoption and diffusion process, and the role of change agents. Extension program planning and evaluation. Livestock and poultry development programs in India. TOT Projects of ICAR. Communication – Process, elements, theories, and methods. ICTs and their application in the livestock sector. Gender and animal husbandry. Sustainable livestock production.

UNIT IX: VETERINARY CLINICAL MEDICINE, VETERINARY GYNAECOLOGY AND OBSTETRICS AND VETERINARY SURGERY AND RADIOLOGY (30 Questions)

General and special clinical examination - General systemic state - etiology, clinical signs, pathogenesis, diagnosis and differential diagnosis, treatment and management of diseases of the digestive system, cardiovascular, respiratory, urinary, nervous, musculoskeletal, hemopoietic, Mammary gland, skin and sense organs - zoo and wild animal diseases - etiology, clinical signs, pathogenesis, diagnosis, prevention and control of metabolic, deficiency diseases - Ethics and jurisprudence and animal welfare in domestic and wild animals.

Female reproductive physiology, Puberty and sexual maturity, Aberrations of estrus and their clinical management, Problems in estrus detection and estrus detection aids, Follicular dynamics, Ovulation and its aberrations, Fertilization, Embryonic mortality, Anoestrus and repeat breeding syndrome, Diagnostic procedures in infertility investigation in female animals, Clinical uses of hormones and drugs in the management of infertility, Assisted reproductive techniques – Synchronization of estrus and ovulation, Multiple ovulation and embryo transfer technology in livestock and zoo animals, *In vitro* fertilization, Maternal recognition of pregnancy, Pregnancy diagnosis and factors affecting gestation length, Implantation, Placentation and its classification, Abortion, Accidents of gestation, Pre, peri and postpartum complications, Parturition and its stages, Dystocia and obstetrical interventions, Obstetrical anesthesia, Male sexual behavior and libido, semen collection techniques, semen evaluation, semen extenders and cryopreservation, Artificial insemination techniques in farm and pet animals, Forms of male infertility, Breeding soundness evaluation of bull, Medical and surgical procedures for population control of the reproduction.

Reproductive physiology; hormones and reproduction; Accidents of gestation, livestock fertility and infertility; artificial insemination; semen characteristics of different species of livestock and cryopreservation. Multiple ovulation and embryo transfer technology in livestock and zoo animals Reproductive disorders and their management.

General surgical principles – pre-and post-operative considerations, anesthesia, asepsis and anti-sepsis and sterilization; scope, history and development of veterinary radiology; Imaging pathology of different parts of body-surgical emergencies – Intensive care – Physiotherapy – Diathermy. Aural Hematoma in dogs-Small Animal GI tract surgical affections- Esophageal foreign Body- GDV-Intussusception-Foreign body syndrome- Megacolon-Ophthalmic affections in small animals-Amputation of tail-Large Animal GI tract affections-Choke-Rumenotomy-Abomasal Affections-Cecal Dilation and Torsion- Atresia Ani-Urogenital affections in small and large animals-Cystotomy-Urethrotomy-Pernieal Urethrostomy-Tube Cystotomy. Orthopaedic Examination of Small Animals-Principles of Internal Fixation- Osteoarthritis and Hip Dysplasia-Patellar luxation in small animals. Conformation of Horses-Lameness examination in large animals-Hoof affections on horses and cattle- musculoskeletal diseases.

UNIT X: LIVESTOCK PRODUCTS TECHNOLOGY (15 Questions)

Layout and management of rural, urban, and modern abattoirs. HACCP concepts in abattoir management. Animal welfare and pre-slaughter care of meat animals. Significance of Meat Inspection in Wholesome Meat Production Procedures of antemortem and post-mortem examination of meat animals. Slaughtering and dressing of meat animals and birds. Importance of evaluation of meat animals and grading their carcasses. Utilization of abattoir byproducts, rendering, and treatment of condemned meat and carcasses. Management of effluent emanating from abattoir. The prospect of the meat industry in India. Structure and composition of muscle. Conversion of muscle to meat. Nutritive value of meat. Fraudulent substitution of meat. Preservation of meat and poultry; drying, salting, curing, smoking, chilling, freezing, canning, irradiation, and chemicals. Aging of meat. Modern processing technologies of meat and meat products. Concept of value addition – Importance of value addition in the meat industry. Physico-chemical and microbiological quality of meat and its products. Nutritive value of egg. FSSAI,

Codex Alimentarius Commission rules, and regulations pertaining to meat.

Retrospect and prospects of milk industry in India - Layout of milk processing plant and its management - Composition and nutritive value of milk - factors affecting milk composition. Physico-chemical properties of milk. Collection, chilling, standardization, pasteurization, UHT treatment, homogenization, and bacto-fugation. Preparation of cream, butter, ghee, channa, paneer, khoa, ice cream, dahi, lassi, mozzarella cheese, and dairy by-products - Dried, dehydrated and fermented milk - Introduction to functional milk products - Organic milk products. Common defects of milk products and their remedial measures - Microbiological deterioration of milk and milk products - Packaging, transportation, storage and distribution of milk and milk products - Good manufacturing practices and implementation of HACCP in milk plant - Food safety standards for milk and milk products - Cleaning and sanitation in milk plant - Dairy effluent management - Sampling of milk - Platform tests - Estimation of fat, solid not fat (SNF) and total solids - Cream separation - Detection of adulteration of milk - Determination of efficiency of pasteurization.

2. Animal Husbandry and Veterinary Science (PG Degree Standard)

Code: 397

UNIT I: GENERAL: (10 Questions)

Role livestock management - food security - Livestock Population Census in the nation and state - Policy note on Animal Husbandry, Government of Tamil Nadu – Current Livestock Development programs and policies of State and Nation - Legislation for control of animal diseases - Legal duties of Veterinarian - Common offences against animals and laws governing import and export of animals - Certification of products - Drugs and Cosmetic Act 1940, Good Manufacturing practices of veterinary biologicals, Basic knowledge on Institutional Bio safety Committee (IBSC), Committee for the control and supervision of experimentation on animals (CCSEA) and Animal Welfare Board (AWB). Contribution of Livestock sector to National and State Economy. WTO, TRIPS, IPR and their impact on livestock sector. Export and import of livestock and livestock products.

UNIT II: ANIMAL BREEDING AND GENETICS, ANIMAL NUTRITION AND LIVESTOCK PRODUCTION MANAGEMENT (20 Questions)

Animal Breeding and Genetics (5 Questions)

Important breeds of cattle, buffalo, sheep, goat, pig and poultry with special reference to economic characters - Principles of Genetics and Cytogenetics - Basis of Population Genetics – Hardy-Weinberg Law, Effects of selection, migration, mutation, genetic drift and inbreeding on gene and genotype frequencies, Effective Population Size, Genetic parameters - Animal Breeding: Aids to selection, methods of selection and culling, Sire Evaluation & Breeding value estimation, Field Progeny Testing, Response to selection. Methods of breeding – Inbreeding and outbreeding – Nucleus Breeding Systems, Synthetic breed formation, selection for combining ability in poultry - Molecular techniques and their applications in Animal Breeding including DNA chips and selection of High Genetic Merit breeding stock - Current livestock and poultry breeding policies and programmes in the state and country - Wild animal breeding in captivity. Pet animals and birds – breeds and breeding - Laboratory Animal Breeding - Conservation of Animal Genetic Resources.

Animal Nutrition (10 Questions)

Nutritional terms and definitions - Proximate composition and fibre fractions of feeds - Digestion and metabolism of nutrients in ruminants and non-ruminants. Importance of minerals and Vitamins in ruminants & non ruminants - Classification of feeds and fodders, antinutritional factors - Storage and conservation of feeds and fodders – Formulation of rations and feeding of Livestock, Poultry, Laboratory and pet animals - Utilisation of unconventional feeds, Industrial and animal by-products - Wild life nutrition. Use of feed additives. Feed milling technology - Laws and regulations of feed manufacturing industry, Codex alimentarius, HACCP. Therapeutic diets for pet animals - Feeding of animals during disaster - Hydroponic fodder - nanonutrients in animal production.

Livestock Production Management (5 Questions)

Common terms used in Animal Husbandry - Identification, Dentition and Age of animals – Watering livestock - Removal and disposal of manure and other animal waste – Disposal of carcasses and bio medical waste - Effect of environment on the health and productivity of livestock and measures to

counteract it - Different systems of housing, enriched housing models, environmental controlled housing for livestock, Housing considerations for various classes of livestock with special reference to laboratory animals -Scientific techniques and regime of feeding and watering different categories of livestock - Traits of economic importance and their inter-relationships - labour management - clean milk production - management strategies different classes of livestock - Indices to assess the reproductive efficiency - Milk parlour systems - laws and practices governing dairy sector in India - Draught animal power - Climatology and livestock production - THSI index - effect of photo period on livestock productivity - Livestock and global warming - Behaviour and Animal Welfare - Significance of laboratory animal production and management - Management of companion animals and its management strategies - Economic importance of integrated farming system - Hatchery management - Different systems of poultry management - sexing and brooding of chicks - Common symptoms of diseases and control measures - Farm record maintenance.

UNIT III: LIVESTOCK PRODUCTS TECHNOLOGY (DAIRY SCIENCE AND MEAT SCIENCE) (10 Questions)

Livestock Products Technology (Dairy Science) (5 Questions)

Retrospect and prospects of milk industry in India - Layout of milk processing plant and its management - Composition and nutritive value of milk - factors affecting milk composition. Physico-chemical properties of milk. Collection, chilling, standardization, pasteurization, UHT treatment, homogenization, and bacto-fugation. Preparation of cream, butter, ghee, channa, paneer, khoa, ice cream, dahi, lassi, mozzarella cheese, and dairy by-products - Dried, dehydrated and fermented milk - Introduction to functional milk products -Organic milk products. Common defects of milk products and their remedial measures - Microbiological deterioration of milk and milk products - Packaging, transportation, storage and distribution of milk and milk products - Good manufacturing practices and implementation of HACCP in milk plant - Food safety standards for milk and milk products - Cleaning and sanitation in milk plant - Dairy effluent management - Sampling of milk - Platform tests - Estimation of fat, solid not fat (SNF) and total solids - Cream separation - Detection of adulteration of milk - Determination of efficiency of pasteurization. Role of milk and milk products in human nutrition, Detection of adulterants in milk. Food safety Norms FSSAI.

Livestock Products Technology (Meat Science) (5 Questions)

Layout and management of rural, urban and modern abattoirs. HACCP concepts in abattoir management. Animal welfare and pre-slaughter care of meat animals. Significance of Meat Inspection in Wholesome Meat Production Procedures of antemortem and post-mortem examination of meat animals. Slaughtering and dressing of meat animals and birds. Importance of evaluation of meat animals and grading their carcasses. Utilization of abattoir byproducts, rendering, and treatment of condemned meat and carcasses. Management of effluent emanating from abattoir. The prospect of the meat industry in India. Structure and composition of muscle. Conversion of muscle to meat. Nutritive value of meat. Fraudulent substitution of meat. Preservation of meat and poultry; drying, salting, curing, smoking, chilling, freezing, canning, irradiation and chemicals. Aging of meat. Modern processing technologies of meat and meat products. Concept of value addition – Importance of value addition in the meat industry. Physico-chemical and microbiological quality of meat and its products. Nutritive value of egg. FSSAI, Codex Alimentarius Commission rules, and regulations pertaining to meat.

UNIT IV: ANIMAL HUSBANDRY EXTENSION AND ECONOMICS (10 Questions)

Principles of extension education - Extension teaching methods, Audio visual aids - Characteristics of rural & urban societies. Diffusion of innovations, Innovation decision process, Adopter categories and factors influencing adoption of technologies, Panchayat Raj. Selection and training of leaders. Extension programme planning and evaluation. Principles and elements of animal husbandry extension management. Human resource management in the animal husbandry sector. ICT initiatives in Livestock Sector, State and Central Governmental Schemes - Role of animals in the economy of livestock owners. Statistics of animal and poultry – National and State wise. Milk and sheep co-operatives - Marketing of livestock and its products. Preparation of feasibility reports and projects (Economics of a dairy unit, poultry, piggery, sheep & goat units). Per capita availability and consumption of milk, meat and egg. Impact of AH programs in the state. Livestock entrepreneurship, avenues and job opportunities.

UNIT V: VETERINARY ANATOMY AND PHYSIOLOGY (20 Questions)

Veterinary Anatomy (10 Questions)

Gross study of bones of Ox and differences in Horse, Dog, Pig and Fowl, Palpable bony prominences of body of domestic animals, joints and muscles of skeleton of Ox. Gross study of heart and its conduction system, General plan of Pulmonary and systemic circulation, Palpable lymph nodes and arteries of the body of domestic animals. Surface veins for Venepuncture, Gross anatomy of Brain and Spinal cord, Gross study of organs of digestive, respiratory, urinary and reproductive system of Ox, Horse, Dog, Pig and Fowl, Systemic histology.

Veterinary Physiology (10 Questions)

Digestion, metabolism and absorption of carbohydrates, proteins and fats in simple stomach animals and ruminants - mechanism of respiration. General functions of blood (bloodcells, plasma & serum) coagulation, blood groups in animals, cardiac cycle, Blood circulation, Blood pressure, renal function. Hormonal control of Lactogenesis. Endocrine control of Physiological system and application of hormones on Production-Renal System - Significance of Avian Excretory System - Physiological Significance of Avian Respiration - Stress Physiology - Mode of Stress management by body - Immune responses and Immune Physiology.

UNIT VI: SURGERY & RADIOLOGY (5 Questions)

General surgical principles - Asepsis and Antisepsis - sutures and suturing methods -Pre medication and Anaesthesia (Local Regional and General) in small and large animals – Anesthetic Monitoring - Anesthetic Emergencies and management - Anesthesia of wild and captive animals. Aural Hematoma in dogs - Small Animal GI tract surgical affections - Esophageal foreign Body – GDV – Intussusception - Foreign body syndrome – Megacolon - Ophthalmic affections in small animals - Amputation of tail - Large Animal GI tract affections - Choke – Rumenotomy - Abomasal Affections - Cecal Dilation and Torsion- Atresia Ani- Urogenital affections in small and large animals –Cystotomy – Urethrotomy - PerniealUrethrostomy - Tube Cystotomy. Orthopaedic Examination of Small Animals - Principles of Internal Fixation - including pinning, plating and external skeletal fixators. Fracture and its complications - Osteoarthritis and Hip Dysplasia - Patellar luxation in small animals - Spinal cord affections and its surgical management. Conformation of Horses - Lameness examination in large animals - Hoof affections on horses and cattle - musculoskeletal diseases -Principles of fracture fixation in large animals. Common surgical affections and operative procedures (Wound, Fracture, and dislocation) – cosmetic surgical operations - Imaging techniques Principles of radiographic interpretation - Ultrasound diagnostic imaging – CT Scan and MRI techniques. Pre-operative and post-operative care of animals - Intensive care - Physiotherapy - Diathermy – Surgical Emergencies.

UNIT VII: GYNAECOLOGY AND OBSTETRICS (5 Questions)

Role of hormones in various phases of reproduction in female & male - Symptoms of estrus and estrous cycle - Embryo Transfer Technology - Fertility and infertility in female&male, diagnosis and treatment - Pregnancy diagnosis - Diseases and accidents during gestation, Abortion - Causes and treatment, Stages of parturition in domestic animals - Typesof dystocia, handling, diagnosis and treatment, post-partum diseases and complications - Collection and evaluation and preservation of semen - Handling of frozen semen - Techniques of AI - Breeding soundness examination of bulls - Castrationin different species. In-vitro fertilization - Transgenic animal production - Sexing of gametes and embryos - Herdhealth improvement program.

UNIT VIII: VETERINARY MICROBIOLOGY AND PREVENTIVE MEDICINE (60 Questions)

Veterinary Microbiology (30 Questions)

General Microbiology - Microscopy - Bacterial growth, Nutrition, metabolism - Bacterial Genetics - Determinants and pathogenicity markers - bacteriophages - antimicrobial agents - resistance and susceptibility. Morphological structure of virus - classification of virus Replication of DNA & RNA viruses - Viral Interactions, pathogenesis, persistence, oncogenicvirus - Immune response to viral infections. Systematic veterinary Bacteriology and Virology Bacterial and Viral diseases of veterinary importance - etiology, antigenic and structural components, pathogenesis, Diagnosis, and control – Prions, emerging & transboundary diseases. Veterinary immunology - Poultry & livestock immune system - types of immunity- Organs and cells of Immune system - Antigens and its characteristics - Immunoglobulins - MHC – Hypersensitivity – Antigen-antibody Interaction – Immunological diseases - Veterinary Vaccine,

Quality control recent advances in Vaccine delivery - Adjuvants – Vaccine failure. Veterinary Mycology, morphology, cultural characters - virulence factors - Antigenic components - pathogenesis - Diagnosis and control of fungal infection - Systematic study & animal mycoses.

Veterinary Preventive Medicine (30 Questions)

Epidemiology – definitions, terms, triad, concept, scope, objectives and uses. Monitoring and surveillance, epidemiological disciplines - investigations, methods, mode and route of disease transmission, observational studies, rates, ratios, occurrence of disease, properties of diagnostic tests, gradient of infection, pattern of diseases, survey, Data collection and ecosystem. Epidemiology, aetiology, pathogenesis, clinical manifestations, diagnosis, differential diagnosis, treatment, prevention and control of common bacterial, viral, fungal, rickettsial, protozoan and parasitic diseases (ecto and endo) of livestock, poultry, companion animals and wild life species, regional - emerging and re-emerging important diseases, notifiable diseases, Allergic skin tests – Intradermal tests and recent serology and molecular diagnostic techniques - disease outbreak investigations and vaccines - quality control - vaccination protocol for infectious diseases of livestock, poultry and pet animals – World Organisation for Animal Health

UNIT IX: VETERINARY PATHOLOGY AND PARASITOLOGY (35 Questions)

Veterinary Pathology (20 Questions)

General Pathology: Causes of diseases - Neoplasm - Disturbances of cell metabolism and growth. Systemic Pathology: Cardio vascular, respiratory, digestive, genital, nervous and skin. Pathology of important diseases caused by bacteria, virus, fungi, helminths and protozoa in livestock and poultry. Clinical Pathology: Examination of clinical materials, postmortem techniques, vetro – Legal implications - Collection and despatch of materials. Preservation of specimens.

Veterinary Parasitology (15 Questions)

Classification of parasites - General life cycle, mode of transmission, pathogenesis, diagnosis and control of Trematodes, Cestodes, Nematodes, arthropods and Protozoa in animals and birds. Use and abuse of antiparasitic drug, anti-parasitic drug resistance, Parasites of zoonotic importance - Anti-parasitic vaccines.

UNIT X: VETERINARY CLINICAL MEDICINE AND VETERINARY PHARMACOLOGY & TOXICOLOGY (25 Questions)

Veterinary Clinical Medicine (10 Questions)

General - Special and systemic clinical examinations - Clinical diagnostic techniques - Diseases of digestive system, cardiovascular, respiratory, urinary, nervous, musculoskeletal, hemopoietic, mammary gland, skin and sense organs - Etiology, clinical signs, pathogenesis, diagnosis, treatment, prevention and control of metabolic diseases and deficiency diseases (Minerals and vitamins) – Diseases of toxicants - Fluid therapy including blood transfusion - emergency and critical care medicine - Ethics and jurisprudence in domestic and wild animals - Interpretation of laboratory results.

Veterinary Pharmacology and Toxicology (15 Questions)

Drug action - Pharmacokinetics (absorption, distribution, biotransformation and excretion), Pharmacodynamics - Local and general anaesthetics - Antibiotics and chemotherapy – Toxicology, Ethno veterinary medicine. Pharmacy – Preparation of ointments liniments and injectable - Dispensing of pharmaceutical preparations. Pharmacokinetics (absorption, distribution, biotransformation, excretion) – Pharmacodynamics (structure and function of receptors, dose-response curve) – Anaesthetics (local and general), sedatives, analgesics - chemotherapy (general principles including resistance, antibacterials, anthelmintics, antiprotozoal) – Toxicology (General principles of treatment of poisoning, antidotes, toxicity of pesticides, herbs, venoms, and toxins) – herbal drugs in veterinary practice – Pharmacy (calculations, prescription writing, drug approval process)

3. Archaeology, Epigraphy, History, Manuscriptology and Tamil (PG Degree Standard)

Code: 565

UNIT I: HISTORY OF ARCHAEOLOGY (15 Questions)

Development of Archaeology in the World: Archaeological Theories – Development of Archaeology in India: Indological Studies, William Jones, James Prinsep, Alexander Cunningham, John Marshall and Mortimer Wheeler - Development in the Post-Independence Period: Archaeological Survey of India, Tamil Nadu State Department of Archaeology and University Departments.

UNIT II: FIELD ARCHAEOLOGY (25 Questions)

Exploration Methods and Techniques - Excavation Methods and Techniques – Archaeological Stratigraphy – Marine Archaeology- Geoarchaeological Applications -Dating Methods: Absolute and Relative –Analysis of excavated materials– Scientific analysis – Documentation – Interpretation and Excavation Report Writing

UNIT III: PRE AND PROTO HISTORY OF INDIA (25 Questions)

Indian Prehistory - Geoarchaeology - Lower Palaeolithic, Middle Palaeolithic and Upper Palaeolithic Cultures - Mesolithic Culture – Neolithic Culture – Rock Art in India – Chalcolithic Cultures – Harappan Culture – Iron Age / Megalithic Culture - Archaeological Sites: Teri Sites, Adichanallur, Sivakalai, Mayiladumparai, Paiyampalli, Pattaraiperumpudur and Attirampakkam

UNIT IV: ART AND ARCHITECTURE (15 Questions)

Art and Architecture: Harappan, Buddhist, Mauryan, Satavahana, Gupta, Chalukya, Rashtrakuta, Hoysala, Vijayanagara and Nayaka- Art and Architecture: Chandelas and Odisha Architecture - Art and Architecture of Tamil Nadu: Pallava, Pandya, Chola, Vijayanagar, Nayaka and Secular Architecture. Introduction to Iconography – Pallava and Chola Bronzes, Mural Painting: Pallava, Pandya, Chola, Vijayanagara and Nayaka.

UNIT V: CONSERVATION, HERITAGE MANAGEMENT AND HISTORICAL ARCHAEOLOGY (20 Questions)

Classification of Cultural Properties: Tangible and Intangible – Concept and Methods of Conservation - Conservation: Prehistoric and Excavated Remains, Rock Cut Caves and Built Heritage – Preservation of Mural Paintings – Marshall's Conservation Manual (1923) - Introduction to Heritage Management - Indian Antiquarian Laws: Heritage Education – World Heritage Monuments. Historical Archaeology – Excavated Sites in India: Sisupalgarh, Kausambi, Hastinapur, Ahichchatra, Nalanda, Taxila, Pataliputra, Vikramsila, Adam, Nagarjunakonda, Amaravati, Hampi, Pattanam(Musiri) - Sites of Tamil Nadu: Korkai, Mangudi, Alagankulam, Keeladi, Porunthal, Kaveripoompattinam, Vallam, Uraiyur, Karur, Kodumanal, Tirukkovilur, Kanchipuram, Vasavasamudram, Arikamedu and Gangaikondacholapuram

UNIT VI: PALAEOGRAPHY (20 Questions)

Epigraphy as a Source- History of Indian Epigraphy – Harappan Signs and Graffiti - Palaeography: Brahmi and Kharoshti Scripts – Asokan Inscriptions – History of Epigraphy in Tamil Nadu –Origin and Development of Tamizhi (Tamil - Brahmi), Vattezhuttu, Tamil and Grantha.

UNIT VII: EPIGRAPHY (25 Questions)

Structure of stone and copper plate Inscriptions – Prasasti/Meikirti - Select Inscriptions: Pulimankombai, Mangulam, Jambai, Pugalur, Arachalur, Pulankurichi, Porpanaikkottai, Manur, and Tirumukkudal – Select Copper Plates: Pallankoil, Kuram, Chinnamanur, Dalavaipuram, Esalam, Thiruvallangadu and Tiruvindalur.

UNIT VIII: NUMISMATICS (10 Questions)

Numismatics as a source – Introduction to Currency System - Punch Marked Coins – Coins: Sangam Age, Roman, Satavahana, Gupta, Pallava, Pandya, Chola, Vijayanagara and Nayaka – Mint and Techniques

UNIT IX: ANCIENT INDIAN POLITY AND PRE- MEDIEVAL TAMIL CULTURE (25 Questions)

Indus Valley Civilization – Rise of Jainism and Buddhism - Persian and Greek Invasions – Impact – Age of Ancient Indian Empires – Rise of Maghada and the Mauryan – Ashoka – Mauryan Administration, art and architecture – The Kushans – Kanishka and his achievements – The Guptas – Chandra Gupta I – Samudra Gupta – Chandra Gupta II – Fahien – Vardhana Kingdom – Harsha Vardhana – Sangam Polity and Society – The Kalabhras – The Pallavas – Polity – Society and Culture – The First Pandyan Kingdom – The Imperial Cholas and the Second Pandyan Kingdom – Vijayanagar Kingdom – Their contribution to religion, Art and Literature.

UNIT X: TAMIL LANGUAGE, GRAMMAR, LITERATURE AND MANUSCRIPTOLOGY (20 Questions)

Ancient Education – Ancient Writing systems – Letters and Symbols – Early Tamil Book printing pioneers – Preservation method of Manuscripts – Traditional methods of Repairing of Manuscripts – Types of Manuscripts – Ethics of Manuscripts and Records.

மொழியின் தோற்றமும் வளர்ச்சியும் – திராவிட மொழிகள், எழுத்து வகைகள் – முதலெழுத்து முதல் மெய்யெழுத்து வரை, மூவிடம் – பால்காட்டும் விருதிகள் சந்தி இலக்கணம், அகப்பொருள், புறப்பொருள் – களவு, கற்பு – முதற்பொருள், கருப்பொருள், உரிப்பொருள் – கொடை, விருந்தோம்பல், புரவலர் புலவர் உறவு – பாவடிவங்கள் – உவமை உருவகம், இலக்கண நூல்கள் – தொல்காப்பியம், நன்னூல் – சங்க இலக்கியம் – பத்துப்பாட்டு, எட்டுத்தொகை – அற இலக்கியம் – திருக்குறள், நாலடியார்.

4. Associate Company Secretaryship (Final)

Code: 473

UNIT I: COMPANIES ACT, 2013 – PART I (30 Questions)

Incorporation of different types of companies – Charter documents – shares and debentures including various modes of issue, buyback, sweat equity etc. – differential voting rights Charges – accounts and audit, including CAG audit – board's report – dividend – corporate social responsibility and its rules

UNIT II: COMPANIES ACT, 2013 – PART II (30 Questions)

Directors and KMP – Composition of Board and Committees – Board and Committee meetings – Secretarial standards on Board and General Meetings – Management and administration including general meetings and postal ballot – rights of shareholders including right to inspect documents

UNIT III: COMPANIES ACT, 2013 – PART III (20 Questions)

Loans, Investments, Guarantees / Security – related party transactions – Borrowings

UNIT IV: CORPORATE RESTRUCTURING AND DISSOLUTION (20 Questions)

Mergers and amalgamations – strike-off – vanishing companies – willful defaulter – winding up – valuation of shares and business – matters relating to joint venture agreements – shareholder agreements, including share subscription and share purchase agreements – due diligence exercises – arbitration clauses – non- disclosure agreements

UNIT V: CAPITAL MARKETS AND SECURITIES LAWS (20 Questions)

SEBI (Listing Obligations and Disclosure Requirements) Regulations, 2015, including compliance relating to related party transactions with knowledge on AS-18/Ind-AS 24 - SEBI (Substantial Acquisition of Shares and Takeover) Regulations, 2011 – SEBI (Prohibition of Insider Trading) Regulations, 2015 – SEBI (Issue of Capital and Disclosure Requirements) Regulations, 2018 – Basics of primary and secondary market, including compliance with stock exchanges

UNIT VI: OTHER LAWS – PART I (20 Questions)

Indian Contract Act, 1872 – Negotiable Instruments Act, 1881 – Specific Relief Act, 1963 – Arbitration and Conciliation Act, 1996 – Laws relating to intellectual property rights

UNIT VII: OTHER LAWS – PART II (30 Questions)

Transfer of Property Act, 1882 – Right to Information Act, 2005 – Tamil Nadu Transparency in Tenders Act, 1998 – Information Technology Act, 2000 – Prevention of Money Laundering Act, 2002 – Foreign Exchange Management Act, 1999 – Fugitive Economic Offender Act, 2018 – Environmental Laws – Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013 – Competition Act, 2002

UNIT VIII: ESG AND BRSR (10 Questions)

Sustainable development – ESG reporting – Business Responsibility and Sustainability Report – Social Stock Exchanges – Green Bonds – Carbon Rating / Green Rating.

UNIT IX: DRAFTING AND COMPLIANCE MANAGEMENT (10 Questions)

Drafting of resolutions, agreements etc. – compliance management – audit and due diligence – secretarial audit – forensic audit – fraud detection techniques.

UNIT X: STRATEGIC MANAGEMENT (10 Questions)

Strategic analysis – formulation of strategy – sources of corporate funding – project evaluation.

5. Basics of Engineering (Degree Standard)

Code: 422

UNIT I: MATHEMATICS (20 Questions)

Matrices: Eigen values – Eigen vectors of a real matrix - Cayley - Hamilton theorem - Similar and Orthogonal transformations - Reduction of a quadratic form to Canonical form by orthogonal transformation. Ordinary differential equations: Order and degree - Higher order linear ODE with constant coefficients - Method of undetermined coefficients - Method of variation of parameters - Cauchy's and Legendre's linear equations. Functions of several variables: Partial derivatives - Total derivatives - Euler's theorem - Implicit functions - Jacobians - Taylor's theorem - Maxima and Minima. Integration: Definite and indefinite Integrals - Techniques of integration using integration by parts and Trigonometric Integrals - Double Integrals - Change of order of integration - Volume Integrals. Vector Calculus: Vectors and scalars - Gradient and Directional derivatives - Divergence and Curl - Applications of Green's theorem, Gauss divergence theorem and Stoke's theorem. Complex variables: Analytic functions - Verification of Analyticity - Construction of Analytic functions - Conformal Mappings - Bilinear transformations. Complex Integration: Cauchy's integral theorem - Cauchy's fundamental theorem - Cauchy's residue theorem - Taylor's and Laurent's series - Contour integration (excluding poles on the real axis). Laplace transform: Existence of Laplace transform - Laplace transform of elementary functions- Properties - Laplace transform of Periodic functions - Inverse Laplace transform - Convolution theorem - Solution of linear second order ODE by Laplace transform technique.

UNIT II: ENGINEERING PHYSICS (25 Questions)

Mechanics: Newton's laws of motion – gravitation – work, energy and power - Properties of matter : Elasticity – moduli of elasticity - Sound : intensity level – reverberation – Ultrasonics : production, detection and applications - Thermal Physics : Thermal expansion - thermal stress - expansion joints - bimetallic strips - thermal conductivity- heat conductions in solids – flow of heat through compound media – Thermodynamics – Laws of thermodynamics – Carnot engine - Applied Optics : Interference – Young's double slit experiment - anti-reflection coatings - Diffraction - Lasers – principle and applications – CO₂ and Nd:YAG laser - semiconductor lasers – applications of Lasers – Optical fibres: classification (index & mode based) - principle and propagation of light in optical fibres - acceptance angle and numerical aperture - fibre optic communication system - Quantum Physics : Photoelectric effect– dual nature of matter and radiation – Heisenberg's uncertainty principle - Schrödinger's wave equation - Physics of Materials : Crystal structures – unit cell – packing factor – Superconductivity : Properties and applications - Magnetisation of matter: Magnetic dipole moment – atomic magnetic moments- magnetic permeability and susceptibility - Magnetic material classification : diamagnetism – paramagnetism – ferromagnetism – Semiconductors : Intrinsic Semiconductors – Energy band diagram – direct and indirect band gap - extrinsic semiconductors – Dielectric materials: Matter polarization and relative permittivity -

dipole moment and polarization vector -polarization mechanisms: electronic, ionic, orientational, interfacial and total polarization- frequency dependence - dielectric strength and break-down in gases, liquids and solids.

UNIT III: ENGINEERING CHEMISTRY (25 Questions)

Fuel -Classification of fuels - Calorific value - Solid fuel - Liquid fuel - Gaseous fuel - Octane number - Cetane Number -Lubricants - Classification - Greases - Solid Lubricants. Water - Sources - Classifications - Softening process - Desalination - RO Method - Internal treatment - Treatment of Water for Municipal purposes. Plastics - High polymer - classification - Polymerization techniques - Thermoplastics - Thermosetting resins - examples. Rubber -Types of Rubber - Vulcanisation - Properties- Unvulcanised and Vulcanised. Natural Rubber - Synthetic Rubber - examples. Refractories - Classification - Manufacture of Refractories - Magnesite - Silica - Zirconia -Chromite. Abrasives - Natural - Artificial-Abrasive paper & cloth. Corrosion: Dry and Wet corrosion - Factors affecting corrosion-Different types of corrosion. Productive coating - Hot dipping- metal cladding, electro deposition - Organic Coatings - Paints - Varnishes. Cement and lime- setting and hardening. Explosives- classifications - characteristics-requirements for good explosives- nitrocellulose- TNT- TNB-DNB-PETN-RDX. Alloys-purpose of making alloy- types of alloys- Ferrous alloys. Electrochemistry - conductors and non-conductors - Kohlrausch law - Electrochemical cell- reversible and irreversible cells - EMF - Concentration cell- polarization - over voltage, decomposition potential. Fuel Cells. Nano Chemistry-Basics- distinction between molecules, Nano materials and bulk materials. Size dependent properties and applications of Nano Materials.

UNIT IV: BASICS OF COMPUTER ENGINEERING (25 Questions)

Computer Organisation - CPU and Microprocessor [ALU, Control Unit and Bus Structure] - Data Storage [Primary, Secondary and Virtual] - Input and Output Devices.

System Software - Assembler - Compiler - Loader - Linker - Operating Systems.

Programming Languages - Classification of Programming Language, Algorithm, Flow chart, Pseudo code, High-Level Languages – Fundamental concepts of C Programming.

Basic Computer Networking - Network Components [Routers, Bridges, Gateways] - ISO-OSI Reference Model - LAN - WAN - Client-Server Architecture - Internet - World Wide Web.

Applications - Office Tools - Word processor - Spreadsheet - Power point - Introduction to Database concepts - E-mail - Browser.

IT Enabled Services - E-Governance - E-Commerce - Multimedia.

UNIT V: BASICS OF CIVIL AND MECHANICAL ENGINEERING (30 Questions)

Introduction to Engineering mechanics - Units and Dimensions - Laws of Mechanics - Coplanar Forces - Static Equilibrium of Rigid body - Moment of force - free body diagram - friction - laws of friction - sliding friction - wedge friction - Rolling resistance - Lader friction - Friction in screws - Screw jack -Belt friction - Properties of surfaces and solids - Centroids and centre of mass - line and areas - Rectangular, circular, triangular areas by integration - T-section, I- Section, Angle section, Hollow section - Area moment of inertia of plane areas - Parallel axis theorem – Perpendicular axis theorem, Polar moment of Inertia, Principle moment of Inertia Mass moment of inertia- Centroid of the simple solids - Dynamics of particle - Displacement, velocity and acceleration - Different types of motion - Rectilinear , Curvilinear and Projectile motions - Newton's II-law of motion - Work Energy equation - Impulse and momentum principles.

UNIT VI: BASICS OF ELECTRICAL AND ELECTRONICS ENGINEERING (30 Questions)

Ohm's law – Kirchoff's laws – Introduction to DC and AC circuits - single phase and three phase circuits – Power and Power factor, Unbalanced and Balanced loads, Operating principles of moving coil and moving iron instruments (voltmeters and ammeters) – wattmeters, multimeter, energy meters and megger, Construction and principle of operation: DC motors- DC generators-Transformers- Induction motors, Characteristics of PN junction diode - zener diode- half wave and full wave rectifiers - Bipolar junction transistor (CC,CE,CB configurations), SCR, Amplifiers- Operational amplifiers – Inverting and Non-inverting amplifiers, Binary number system- logic gates- Boolean algebra - Half and full adders- Flip-flops -registers and counters- A/D and D/A conversion, Types of analog and digital signals- Modulation and Demodulation(amplitude and frequency) Communication systems: Radio- TV- Fax- Microwave-Satellite and optical fibre.

UNIT VII: PRINCIPLES OF MANAGEMENT (15 Questions)

Management - Definition, Evolution of Management Philosophies, Types of Business, Environment Analysis - Planning- Types, Steps, Forecasting, MBO, MBE. Organizing – Departmentation, Line and Staff Authority, Delegation and Decentralization. Staffing - Manpower Planning, Recruitment and Selection, Training, Performance Appraisal. Directing – Theories of Motivation, Leadership Styles, Power and Politics, Change Management, Conflict Management, Communication in Business- Controlling Types, Control Techniques, Budgetary and Non-Budgetary Control.

UNIT VIII: TOTAL QUALITY MANAGEMENT (15 Questions)

Quality – Definitions, Vision, Mission and Policy statements-Dimensions of Product and Service Quality- Contributions of Quality Gurus-Deming, Juran, Crosby, Masaaki Imai, Feigenbaum, Ishikawa. Costs of Quality- Continuous Process Improvement- PDCA, Quality Circle, 5S, Kaizen-Statistical Process Control (SPC), 7QC Tools, New Management Tools of Quality, Bench Marking, 6 sigma, Quality Function Deployment (QFD), POKAYOKE, Total Productive Maintenance (TPM), Business Process Reengineering (BPR), Quality Certifications.

UNIT IX: ENVIRONMENTAL SCIENCE AND ENGINEERING (15 Questions)

Definition, scope and importance of environment – need for public awareness. Eco-system and Energy flow– ecological succession. Types of biodiversity: genetic, species and ecosystem diversity– values of biodiversity, India as a mega-diversity nation – hot-spots of biodiversity – threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts – endangered and endemic species of India – conservation of biodiversity: In-situ and ex-situ. Environmental pollution: Causes, Effects and Preventive measures of Water, Soil, Air and Noise Pollutions. Solid, Hazardous and E-Waste management. Energy management and conservation, New Energy Sources - Need of new sources. Different types of new energy sources. Applications of- Hydrogen energy, Ocean energy resources, Tidal energy conversion. Concept, origin and power plants of geothermal energy. Sustainability and management - Development , GDP, Sustainability- concept, needs and challenges-economic, social and aspects of sustainability-from unsustainability to sustainability-millennium development goals, and protocols-Sustainable Development Goals-targets, indicators and intervention areas. Climate change- Global, Regional and local environmental issues and possible solutions. Concept of Carbon Credit - Carbon Footprint. Environmental management in industry- Material Life cycle assessment, Environmental Impact Assessment. Sustainable habitat: Green buildings, Green materials, Energy efficiency, Sustainable transports. Sustainable energy: Non-conventional Sources, Energy Cycles carbon cycle, emission and sequestration, Green Engineering: Sustainable urbanization- Socio-economical and technological change.

6. Bio-Technology (PG Degree Standard)

Code: 471

UNIT I: BASIC ZOOLOGY AND WILD LIFE BIOLOGY (14 Questions)

Non-chordate, chordate, classification and relationship of various phyla up to subclasses, symmetry, parasitic adaptation, metamorphosis in insect and its hormonal regulation, mollusc, pisces, amphibian, reptilian, aves, mammalian, ecology, biosphere, concept of ecosystem, population characteristics, population dynamics, ethology, social organization in insects, evolution, theories of origin of life, physiology with special reference to mammals.

Scope and importance of wildlife of India, forestry, silviculture, forest entomology, behaviour of wildlife, wildlife management techniques, wildlife census techniques, human wildlife conflicts, health care of wildlife, conservation of wildlife, modern concepts in wildlife conservation, wildlife administration and legislation, ecology, environment and conservation biology.

UNIT II: MICROBIOLOGY (14 Questions)

History and microbial taxonomy, major discoveries related to the field of microbiology, microbial growth and metabolism, nutritional requirements for growth, identification of bacteria microbial growth control, epidemiology of microbes, microbial diseases, agricultural microbiology, environmental microbiology, biogeochemical cycles, and biotechnological application of extremophiles.

UNIT III: CELL & MOLECULAR BIOLOGY (30 Questions)

Introduction to cell biology, basic properties of cells, cellular dimension, cell origin and evolution, microscopy, flow cytometry, organelles of the eukaryotic cell and its functions, bio membranes, structural organization, transport across membrane, cell adhesion, cell junctions, structure of nucleic acids, genome organization in prokaryotes and eukaryotes, DNA replication, transcription, translation, site of synthesis of organelle, membrane proteins, nucleus.

Genes, chromosomes, co-linearity of genes, proteins, genetic code, identification of DNA as the genetic material, the complexity of eukaryotic genome, DNA markers, SNP and their detection techniques, gene expression and regulation in prokaryotes and eukaryotes, mutations, chromosomal abnormalities, genetic diseases, techniques in the study of chromosomes, recombination, DNA damage and repair, allele frequencies and genotype frequencies, Hardy-Weinberg principle, genetics and evolution, random genetic drift, karyotyping, chromosome mapping, biology of plasmids, Human Genome Project, Genomics and Modern methodologies in understanding genome.

Definition and scope of developmental biology, gametogenesis, fertilization, mechanism of fertilization in mammal & sea urchin, types of fertilization, fate maps, vertebrate development.

UNIT IV: ENZYMOLOGY & IMMUNOLOGY (14 Questions)

Introduction to enzymes, classification, nomenclature, general properties, extraction, kinetics of enzyme catalysis, kinetic constants, inhibition of enzyme activity, enzyme catalysis, enzyme specificity, catalysis, coenzyme action, enzyme regulation, enzyme engineering.

History and overview of the immune system, types of immunity, physiology of immune response, immune system, biology of antigens, immunoglobulin, monoclonal antibody transplantation, immunotechniques and its applications.

UNIT V: GENETIC ENGINEERING, PLANT & ANIMAL BIOTECHNOLOGY, MARINE & ENVIRONMENTAL BIOTECHNOLOGY (30 Questions)

Gene cloning, genetic engineering tools, rDNA technology, gene libraries, vectors, cloning, nucleic acid hybridization techniques, molecular probes, DNA fingerprinting; DNA sequencing, site directed mutagenesis; DNA microarray; chromosome walking and jumping, gene therapy, transgenic animals and plants, modern concepts in genetic analysis.

Introduction of plant tissue culture, composition of media, micropropagation, organogenesis, plant transformation, animal health disease diagnosis, hybridoma technique, prophylaxis, cryopreservation, animal cell culture, cell line, cloning micromanipulation, transgenic animals.

Aquaculture, culture of sea weeds, marine micro algae, marine hydrocolloids, marine enzymes, marine lipids, marine flavourants, aquaculture biotechnology, production of transgenic fishes, pharmaceuticals from marine realms, biofouling, marine bioremediation, marine flora, marine fauna, marine resources assessment, population study, marine environment protection, oceanography, marine microbes, biology of microorganisms used in genetic engineering, microbial assessment, role of microbes in marine environment, microbial, microbial interaction, culture systems, hatchery techniques, aquafarms, marine pharmacology, microbial techniques, disease diagnosis, environment interaction, marine pollution, wastewater bio-treatment, bioaugmentation.

Concept of environment, environmental pollution, biofilm kinetics, waste water management, toxicity, biosensors, biomonitoring, biomagnification, biomining, biofuels, bioremediation; xenobiotics, solid waste, bioethics, need for bioethics, biosafety, IPR, patenting, copyright, industrial designs, trademarks, geographical indications, layout, registration, bioprospecting, biopiracy.

UNIT VI: BIOINFORMATICS, PROTEOMICS & GENOMICS (30 Questions)

Database concepts, internet and its application, introduction to bioinformatics, protein and nucleotide databases, information retrieval from biological databases, sequence alignment, artificial intelligence, database searching, bioinformatics for genome sequencing, genome maps, markers, genome variation, protein structure, molecular visualization tools, medical application of Bioinformatics.

Whole genome analysis, foundations of genomics, mapping of genome, genome library construction, genome sequencing, annotation of genome, genomics versus proteomics.

UNIT VII: TISSUE ENGINEERING & STEM CELL BIOLOGY (14 Questions)

Basic biology of tissue engineering, tissue development, 3D cell culture, biomaterials in tissue engineering, structural tissue engineering, periodontal applications.

Stem cells, pluripotency, self-renewal and differentiation, types of stem cells, stem cell isolation and culture techniques, stem cell cycle, ethics in human stem cell research.

UNIT VIII: NANOBIO TECHNOLOGY (14 Questions)

Introduction to nanotechnology, preparation of nanomaterials, DNA based nanostructures, protein-based nanostructures, magnetic nanoparticles for imaging, hyperthermia, nanotoxicology, risk assessment and safety regulation of nanoparticles.

UNIT IX: BIOINSTRUMENTATION (20 Questions)

Microscopic techniques, its principles and applications, centrifugation, chromatography techniques, electrophoretic techniques, ELISA, RIA, blotting, electro blotting, PCR, RT-PCR, microarray (DNA, Proteins), spectroscopic techniques, radio- isotopic techniques.

UNIT X: RESEARCH METHODOLOGY & BIOSTATISTICS (20 Questions)

Research methodology, review of literature, writing the research report, standard deviation, spreadsheet tool, web search.

Statistics, sampling method, sample estimates, measures of central tendency, measures of dispersion, correlation, regression, probability, probability distribution, normal distribution, Inference, sampling distribution, correlation coefficient, tests of significance, spreadsheets, statistical packages.

7. Business Administration (PG Degree Standard)

Code: 385

UNIT I: MANAGEMENT CONCEPTS (15 Questions)

The development of Management thought-Pre scientific management era – Human relation era – Social sciences era – Management sciences era. Definitions of Administration and Management – Basic Principles and Process of Management. Functions of Management : Planning, Organising, Staffing, Directing, Coordination and Controlling. Management by objectives – Process of MBO – Management by Exception.

UNIT II: MANAGERIAL ECONOMICS (10 Questions)

Introduction to Economics; Nature and Scope of Managerial Economics – Significance in Decision - Making and Fundamental Concepts-Objectives of a Firm - Role of Economic Analysis in managerial decisions. The Concept of Profit. Nature and Measurement of Profits - Profit Maximization - Profit Planning and control – Profit Policies – Cost Volume Profit Analysis. National Income – Definition, Concepts and Various Methods of its Measurement– Inflation, Types and Causes - National Income and Economic Welfare-Business Cycles and Business Forecasting – Measuring Business Cycles Using Trend Analysis

UNIT III: ORGANISATIONAL BEHAVIOUR (20 Questions)

Organisational Behaviour :Importance – Historical Development of Organisation Behaviour- Understanding Individual :Personality- Perception-Learning-Values-Attitude- Job Involvement – Organisational Commitment – Job Satisfaction – Emotions – Emotional Intelligence – Spiritual Quotient. Understanding groups: Meaning of group and group dynamics – Theories of Group Dynamics – Group Cohesiveness – Team Building- Management of change-Organisational Culture-Management of Conflict-Organizational Citizenship Behaviour.

UNIT IV: HUMAN RESOURCE MANAGEMENT (20 Questions)

Functions of HRM – Managerial Functions and Operative functions – Organisation of HRM Department – Qualities and Qualification of HR Managers – HR Policies - Environmental influences of HRM – HRM Challenges – HRM Strategies. Recruitment and Selection- Job Analysis- Job Evaluation-Performance Appraisal-Training and Development-Quality of Working Life-e HRM

UNIT V: RESEARCH METHODOLOGY AND STATISTICS (10 Questions)

Research – Meaning – Types – Nature and scope of research – Review of Literature - Problem formulation – Statement of research Objective – Value and cost of information – Research Questions – Research Gap - Decision theory – Research process – Research designs – Experimental Research. Methods of data collection – Sampling – Measure of Central Tendency -Measure of Dispersion - Testing of Hypothesis – Correlations - Regression- Multivariate Analysis - Research Report

UNIT VI: OPERATIONS MANAGEMENT (20 Questions)

Operations Management concept, objectives and types – Characteristics of Modern Operation Management – Differences between Services and Goods – Operation Strategy – Supply Chain Management – Warehousing and Supply Chain Strategies – Supply Chain Dynamics. Operations Planning- Work study: Objectives, Procedures – Method Study and Motion Study - Work Measurement and Productivity. Total Productive Maintenance- Materials management and Purchase Management - Project management - Quality Control – Quality Movement – Continuous Improvement – Tools – Total Quality Management (TQM) concepts – ISO Quality Certification – Quality Assurance.

UNIT VII: MARKETING MANAGEMENT (50 Questions)

Marketing – Definition – Importance – Concepts in Marketing, Marketing Concepts – Traditional and Modern Concepts – Marketing Environment, Marketing Strategies – Kinds of Marketing Strategies – Marketing Mix Concept – Marketing Research and Information – Objectives and Process. Consumerism – Problems of consumer protection – Developments in Consumer Protection in India - Government and Marketing – Neo Marketing Trends – e-Marketing – Tele-marketing – Green Marketing – Event Marketing – Viral Marketing – Direct Marketing- Ethics in Marketing & Advertisement.

UNIT VIII: MANAGEMENT INFORMATION SYSTEM & E-COMMERCE (20 Questions)

Data, Information, Intelligence, Information Technology, Information System, Functional Information Systems, DSS, EIS, KMS, GIS, International Information System-Data Base Management System- Role of information management in ERP, e-governance, Data Mining, Business Intelligence, Pervasive Computing, Cloud computing, CMM. Electronic Commerce: Technical Components of E-Commerce Functions of E-Commerce - Advantages and disadvantages of E- Commerce -Electronic Commerce and Electronic Business - Electronic Commerce Technology - Building the E-Business application - Avoiding legal issues- Web strategy: Attracting and retaining visitors - Search Engines and Portals- Cyber service - Online Banking.

UNIT IX: ACCOUNTS AND AUDITING (10 Questions)

Basic Accounting concepts - Kinds of Accounts. Double Entry Book Keeping - Journal and Ledger Accounts- Subsidiary books- Trial balance - Errors – Types of errors - Rectification of errors – Bank reconciliation statement – Manufacturing - Trading - Profit & Loss Account - Balance sheet. – Accounting for non-trading Institutions-Income & Expenditure Account-Receipts and Payment Accounts and Balance sheet – Accounting for depreciation – methods of depreciation –Preparation of accounts from incomplete records. Auditing – Origin – Objectives – Types - qualities of an Auditor - Audit programmes - verification and valuation of Assets and Liabilities. Investigation-objectives of investigation - Audit of computerized-Accounts - electronic auditing

UNIT X: FINANCIAL MANAGEMENT (25 Questions)

Finance Functions – Nature And Scope – Evolution Of Finance Function – Its New Role in The Contemporary Scenario – Goals Of Finance Function – Maximising Profit Vs Wealth – Cost – Risk – Return- Trade Off – Concept Of Time Value Of Money – Future Value and Present Value and The Basic Valuation Model - Sources Of Short Term Financing – The Management Of Working Capital -Cash Management Strategies - Receivables Management- Sources of Long Term Finance - Cost Of Capital and Capital Structure - Economic Value Added (EVA)-Risk and Uncertainty - Risk Management- Return on Investment.

8. Chemical Engineering (Degree Standard)

Code: 405

UNIT I: CHEMICAL PROCESS CALCULATIONS AND CHEMICAL ENGINEERING THERMODYNAMICS (25 Questions)

Properties of gases, liquids and solids, Humidity and saturation, Gas laws, steady and unsteady state material and Energy balances including multiphase- involving recycle, by-pass and purge systems, Material and Energy balance with reactions, use of tie components, Gibbs Phase rule and degree of freedom analysis. Laws of Thermodynamics and its applications- Thermodynamics functions - Chemical and Phase Equilibrium - Ideal and non-ideal gases and solutions – Equation of state and residual properties, compression of fluids, Second law and entropy, Chemical potentials, properties of mixtures- fugacity, partial molar properties, excess properties and activity coefficient. Predicting VLE of systems, Free Energy Change and Chemical Reaction Equilibrium.

UNIT II: MECHANICAL OPERATIONS AND ENGINEERING MATERIALS (20 Questions)

Characteristics of solids, laws of size Reduction, free and hindered settling, centrifuge and cyclone, thickeners and classifiers, Mixing and agitation, Filtration, Sedimentation. Conveying of solids. Materials of construction for chemical Industries, Metallic, Non-metallic, Polymeric and composite materials, Refractory, corrosion -prevention and control. Smart materials for Chemical Engineering applications- Nano and biomaterials.

UNIT III: CHEMICAL TECHNOLOGY AND RENEWABLE ENERGY SOURCES (20 Questions)

Acids, Fertilizers, marine Chemicals, Cement, Glass, Ceramic and Refractories, Petroleum Refining Products, Fermentation Products, Oils, Soaps and Detergents, Pulp and paper, Dyes, sugar, leather and rubber, polymer, pharmaceutical and food industries. Sustainable energy resources- solar, thermal, photoelectric, tidal, geothermal, nuclear, wind, bio-energy, sources, energy storage and conversion- battery and fuel Cells, Energy efficiency estimation.

UNIT IV: FLUID MECHANICS AND HEAT TRANSFER OPERATIONS (25 Questions)

Fluid Statics, Newtonian and Non-Newtonian fluids, Types of Manometers, Equation of continuity, Equation of motion, Bernoulli equation, Friction Factor, Dimensional analysis and similitude, Flow through pipes, velocity profiles, flow through fixed and fluidized beds, flow meters, Fans, blowers, pumps and compressors, Energy Equations, Modes of Heat transfers, Heat transfer with phase change, thermal insulation, thermal boundary layer and heat transfer coefficient. Design of heat exchangers- Double pipe, Shell and tube, single and multiple effect evaporators

UNIT V: MASS TRANSFER AND SEPARATION OPERATIONS (25 Questions)

Fick's Laws, Diffusion, Mass Transfer Coefficient and theories of Mass Transfer, Momentum, heat and mass transfer analogies, Inter phase Mass transfer operations, HTU, NTU and HETP concepts, Design of equipment -Distillation column, Extraction, Adsorption, Absorption, Drying, humidification and de-humidification. Crystallization, Membrane separation processes - frame, tubular, spiral wound and hollow fibre membrane reactors, dialysis, reverse osmosis, nano/ultra filtration, microfiltration. Ion Exchange chromatography and electrodialysis, Separations involving pervaporation and permeation techniques for solids, liquids and gases, supercritical fluid extraction.

UNIT VI: CHEMICAL REACTION ENGINEERING (20 Questions)

Reaction rates - laws - theories and analysis, homogeneous and heterogeneous reactions, single and multiple reactions in ideal reactors. Kinetics of enzyme reactions. Non ideal reactors - Residence time distribution, Single parameter model. Design of reactors- Isothermal and adiabatic fixed bed reactors, non-isothermal and non-adiabatic fixed bed reactors, fluidized bed reactors. Kinetics of heterogeneous catalytic reactions. Diffusion effects in catalysis- rate and performance equations for Catalyst deactivation.

UNIT VII: PROCESS DESIGN, INSTRUMENTATION AND CONTROL (20 Questions)

Problem formulation, degree of freedom analysis, objective functions, Simplex method, Barrier method, sensitivity analysis, Convex and concave functions, unconstrained NLP, Newton's method, Quasi-

Newton's method, Direct substitution, Quadratic programming, Cost estimation, Plant utilities, Heat exchanger networks, Pinch technology. Principles of measurements and classification of process instruments, measurement of process variables - Laplace transformation, application to solve ODEs. Open-loop systems, first order systems, first order systems in series, linearization and its application in process control, second order systems and their dynamics; transportation lag. Closed loop control systems, feed-back control systems, BODE diagram, stability criterion, frequency response, tuning of controller settings, cascade control, feed forward control, control of distillation towers and heat exchangers.

UNIT VIII: NUMERICAL AND COMPUTATIONAL METHODS (15 Questions)

Curve fitting, Equations with real and rational Coefficients, Imaginary roots and irrational roots, Transformation of equations. Numerical solutions of linear and non linear algebraic equations- solution of initial value and boundary value, ordinary and non-linear differential equations, Integration of trapezoidal and Simpson rule. Solution of partial differential equations. Partial Differential equation – finite element, finite difference method - Matrix, determinants and properties – Elementary Row transformations algebraic equations; ordinary differential equations and non homogeneous first order ordinary differential equations, rank of Matrix, Eigen value problems, Orthogonal and ortho normal vectors; Gram-Schmidt orthogonalization; Theorem for Eigen values and Eigen functions.

UNIT IX: ENVIRONMENTAL ENGINEERING, OCCUPATIONAL SAFETY AND HEALTH IN CHEMICAL INDUSTRIES (15 Questions)

Air, Water and soil pollution, causes, effects and remedies, Nuclear waste disposal, Noise control. Wastewater treatment by various methods: Chemical, biochemical and advanced oxidation process. Industrial hygiene, occupational safety & health in chemical industries, Industrial safety principles, site selection and plant layout, chemical hazards identification & classification, Safety in operations and processes, fire safety, hazard identification techniques, disposal of hazardous and toxic wastes, onsite and offsite emergency preparedness plan, safety audit, work permit system, roles and responsibilities of safety officers and welfare officers, occupational diseases.

UNIT X: PROFESSIONAL ETHICS, LAWS & LEGISLATIONS: (15 Questions)

Morals, values and Ethics – Integrity – Work ethic - Valuing time – Cooperation – Commitment – Empathy – Senses of Engineering Ethics – Variety of moral issues – Types of inquiry – Moral dilemmas – Moral Autonomy – Kohlberg's theory – Gilligan's theory – Consensus and Controversy – Models of professional roles – Theories about right action - Engineering as Experimentation – Engineers as responsible Experimenters – Codes of Ethics – A Balanced Outlook on Law. Safety and Risk – Assessment of Safety and Risk – Risk Benefit Analysis and Reducing Risk – Respect for Authority – Collective Bargaining – Confidentiality – Conflicts of Interest – Occupational Crime – Professional Rights – Employee Rights. Intellectual Property Rights (IPR), Employee Discrimination. Multinational Corporations, Environmental Ethics & legislation – Engineers as Managers, Expert Witnesses and Advisors. Moral Leadership, Code of Conduct, Corporate Social Responsibility. Labour laws and legislations – Criminal procedure code – Indian Penal Code.

9. Chemical and Mechanical Engineering (Degree Standard)

Code: 528

UNIT I: CHEMICAL TECHNOLOGY, CHEMICAL PROCESS CALCULATIONS, MECHANICAL OPERATIONS (20 Questions)

Fertilizers, Cement, Glass, Ceramic and Refractories, Fermentation Products, Oils, Soaps and Detergents, Pulp and paper, Dyes, sugar, leather and rubber, polymer, pharmaceutical and food industries, Marine chemicals. Properties of gases, liquids and solids, Humidity and saturation, Gas laws, steady and unsteady state material balance - involving recycle, by-pass and purge systems, Material with reactions, use of tie components, Gibbs Phase rule and degree of freedom analysis. Laws of size Reduction, Mixing and agitation, Filtration, Sedimentation and Conveying of solids. Materials of construction for chemical Industries - Metallic, Non-metallic, Polymeric and composite materials, Nano and biomaterials. Corrosion - prevention and control.

UNIT II: THERMODYNAMICS, FLUID MECHANICS AND HEAT TRANSFER (20 Questions)

Thermodynamics functions - Chemical and Phase Equilibrium - Ideal and non-ideal gases and solutions – Equation of state and residual properties, compression of fluids, Second law of Thermodynamics and entropy, Chemical potential, properties of mixtures- fugacity, partial molar properties, excess properties and activity coefficient. Predicting Vapour Liquid Equilibrium (VLE) of systems, Free Energy Change and Chemical Reaction Equilibrium. Fluid Statics, Newtonian and Non-Newtonian fluids, Types of Manometers, Equation of continuity, Equation of motion, Bernoulli equation, Friction Factor, Dimensional analysis and similitude, Flow through pipes, velocity profiles, flow through fixed and fluidized beds, flow meters. Thermal boundary layer and heat transfer coefficient. Design of heat exchangers- Double pipe, Shell and tube, single and multiple effect evaporators.

UNIT III: MASS TRANSFER, SEPARATION PROCESSES AND PROCESS CONTROL (20 Questions)

Fick's Laws, Diffusion, Mass Transfer Coefficient and theories of Mass Transfer, Momentum, Heat and Mass transfer analogies, Inter phase Mass transfer operations, Transfer Unit concepts, Design of equipment - Distillation, Extraction, Absorption, Drying. Crystallization and Membrane separation processes, Ion Exchange chromatography and electrodialysis, Separations involving pervaporation and permeation techniques for solids, liquids and gases, supercritical fluid extraction. Sensitivity analysis, Constrained and unconstrained NLP, Newton's method, Quasi-Newton's method, Cost estimation, Plant utilities, pinch technology, Laplace transformation, application to solve Ordinary Differential Equation (ODEs). Open-loop systems, first order systems, first order systems in series, second order systems and their dynamics; transportation lag. Closed loop control systems, feed-back control systems, BODE diagram, stability criterion, frequency response.

UNIT IV: CHEMICAL REACTION ENGINEERING AND COMPUTATIONAL METHODS (20 Questions)

Reaction rates - homogeneous and heterogeneous reactions, single and multiple reactions in ideal reactors. Residence time distribution. Design of reactors - Isothermal and non-isothermal fixed bed reactors and fluidized bed reactors. Kinetics of heterogeneous catalytic reactions. Diffusion effects in catalysis- rate and performance equations, Catalyst deactivation. Numerical solutions of linear and non-linear algebraic equations, solution of initial and boundary values, Integration of Simpson rule. Solution of partial differential equations. Eigen value problems - Theorem for Eigen values and Eigen functions.

UNIT V: ENVIRONMENTAL ENGINEERING, OCCUPATIONAL SAFETY AND HEALTH IN CHEMICAL INDUSTRY (20 Questions)

Air, Water, Soil pollution and Noise control. Wastewater treatment by various methods: Chemical, biochemical and advanced oxidation process. Industrial hygiene, occupational safety & health in chemical industries, Industrial safety principles, plant layout, chemical hazards identification and classification, Safety in operations and processes, fire safety, hazard identification techniques, disposal of hazardous and toxic wastes, onsite and offsite emergency preparedness plan, safety audit, work permit system, roles and responsibilities of safety officers and welfare officers, occupational diseases. Kohlberg's theory – Gilligan's theory - Safety and Risk – Assessment, Risk Benefit Analysis and Reducing Risk, Respect for Authority, Collective Bargaining, Confidentiality, Conflicts of Interest, Occupational Crime, Professional Rights, Employee Rights. Intellectual Property Rights (IPR), Employee Discrimination. Multinational Corporations, Environmental Ethics & legislation – Engineers as Managers, Expert Witnesses and Advisors. Moral Leadership, Code of Conduct, Corporate Social Responsibility

UNIT VI: ENGINEERING MECHANICS (20 Questions)

Statics of Particles, Equilibrium of Rigid bodies, Mechanism of Deformable Bodies, Properties of Surfaces and Solids, Centroid, Centre of Gravity, Dynamics of Particles, Elements of Rigid Body Dynamics, Basics of Mechanisms, Kinematics of mechanisms, Friction in Machine Elements, Force Analysis, Balancing, Single Degree Free Vibration, Forced Vibration, mechanisms for Vibration Control, Effect of Damping, Vibration Isolation. Stress, Strain and Deformation of Solids, Combined Stresses, Theories of Failures, Transverse Loading on Beams, Stresses in Beams, Torsion, Deflection of Beams, Fundamentals of Design for Strength and Stiffness of Machine Members, Design of Shafts and Couplings, Design for Static and Dynamic Loading, Design of Fasteners and Welded Joints, Reverted Joints.

UNIT VII: FLUID MECHANICS AND MACHINERY (20 Questions)

Fluid properties, manometry, buoyancy of mass, momentum and energy, fluid acceleration, differential equations of continuity and momentum, viscous flow of incompressible fluids, boundary layer, elementary

turbulent flow, head losses in pipes, bends. Turbo machinery: Pelton wheel, Francis and Kaplan turbines - impulse and reaction principles – pumps and its applications-Valves and Types - Online Continuous Flow Monitoring System.

UNIT VIII: THERMAL ENGINEERING (20 Questions)

Basic concepts, Zeroth, Thermodynamic system and processes, Carnot cycle. Behaviour of ideal and real gases, thermodynamic relations, properties of pure substances, calculation of work and heat in ideal processes, analysis of thermodynamic cycles related to energy conversion, Fuel and combustion, Fuels Characteristics, Emissions and Controls, Renewable sources of Energy. Modes of heat transfer - one dimensional heat conduction, resistance concept, electrical analogy, unsteady heat conduction, fins dimensionless parameters - Free and forced convective heat transfer, effect of turbulence, radiative heat transfer, black and grey surfaces, heat exchanger performance, LMTD and NTU methods. Basic Concepts of Mass transfer, Diffusion Mass Transfer, Steady state Molecular diffusion, Convective Mass Transfer, Radiative Heat Transfer.

UNIT IX: MATERIALS AND MANUFACTURING TECHNOLOGY (20 Questions)

Constitution of alloys and phase diagrams, Iron – Iron Carbide Phase Diagram - steels, cast iron, phase transformations- diffusion-TTT diagram, ferrous and nonferrous alloys, heat treatment of ferrous and non-ferrous metal, surface modification techniques, powder metallurgy, non-metallic materials, mechanical properties and testing, nano-materials. Foundry Technology- types of pattern, cores, moulding and casting methods, Solidification, design of castings, defects, Melting Furnaces, Metal Forming Processes - Metal joining processes, Thermo Setting and Thermo Plastic Products, Metal cutting, Cutting Tool Nomenclature, Machine Tool Types and its machining operations - Unconventional machining processes, CNC machine tools. Limits, Fits and Tolerance, Linear and angular measurements, Interferometry, laser interferometers - Computer Aided Inspection, CMM – Types of CMM, Machine vision, Form measurement – Straightness - Flatness, Roundness, Surface finish measurement, Measurement of power, flow and temperature. Statistical quality control, control charts, acceptance sampling, reliability, TQM, 5S, ISO standards.

UNIT X: CAE AND INDUSTRIAL ENGINEERING (20 Questions)

Fundamentals of CIM, Production Planning and Control, Computer Aided Process Planning, Cellular Manufacturing, Flexible Manufacturing System and Automated Guided Vehicle System, Group Technology, Production Flow Analysis, Industrial Robotics, Additive Manufacturing, Just in Time (JIT), lean manufacturing, One Dimensional Problems in FEA, Two Dimensional Scalar Variable Problems, Two dimensional vector variable problems, Isometric Parametric Formulation. Work study - Techniques, Method study and work measurements - machine loading and scheduling, inventory control - E O Q - ABC Analysis material handling systems, operations research, Linear Programming, simplex method, Transportation model, Assignment model CPM and PERT,. Management theory and practice, planning - Decision making, Organising, staffing, Motivation, Leadership, controlling, control techniques, Industrial Safety - Standards – OSHA.

10. Computer Science, Information Technology, Electrical, Electronics, Communication and Mechanical Engineering (Degree Standard)

Code: 566

UNIT I: PROGRAMMING IN C, PYTHON AND OBJECT ORIENTED PROGRAMMING (20 Questions)

C Programming:

Data Types – Expressions – Input / Output Operations – Decision Making and Branching Statements – Looping Statements – Arrays – Initialization – Declaration – One dimensional and Two dimensional arrays. String – string operations – String Arrays. Simple programs – sorting – searching – matrix operations – Function – Definition of function – Declaration of function – Pass by value – Pass by reference – Recursion – Pointers – Definition – Initialization – Pointers arithmetic - Pointers and arrays – structure date type – structure definition – Structure declaration – Structure within a structure – Union

– Programs using structures and Unions – Storage classes, Pre-processor directives - File Handling.

Python Programming:

Python Interpreter and Interactive Mode-Data types-Statements- Expressions-Boolean Values and Operators-Strings-Arrays of Numbers- Lists-Tuples-Dictionaries-Functions-File Reading and Writing

Object Oriented Programming:

C++ Programming features – Data Abstraction – Encapsulation – Class – Object – constructors – static members – constant members – member functions – pointers – references – Role of this pointer – Storage classes – function as arguments – String Handling – Copy Constructor – Polymorphism – compile time and run time polymorphisms – Function overloading – operators overloading – dynamic memory allocation – Nested classes – Inheritance – virtual functions. Abstract class – Exception handling – File handling concepts.

UNIT II: DATA STRUCTURES AND ALGORITHMS (20 Questions)

List ADT – array based implementation – linked list implementation – singly linked lists – circularly linked lists – doubly-linked lists – applications of lists – Polynomial Manipulation – All operation (Insertion, Deletion, Merge, Traversal) – Stack ADT – Evaluating arithmetic expressions – other applications – Queue ADT – circular queue implementation – Double ended Queues – Priority Queues - application of queues – Trees: Binary Tree - Binary Search Tree-Tree Traversals – Sorting algorithms: Insertion sort – Selection sort – Shell sort – Bubble sort – Quick sort – Merge sort – Radix sort – Heap Sort - Searching: Linear search – Binary Search - Hashing: Hash Functions – Separate Chaining – Open Addressing – Rehashing – Extendible Hashing – Graph Algorithms: Minimum Spanning Tree – Shortest Path Algorithms - Graph Traversals -Directed Acyclic Graph- Topological Ordering-All Pair Shortest Path Algorithms- Floyd Warshall algorithm- Bellman Ford Algorithm-Network Flow Algorithms- Ford Fulkerson Algorithm- Algorithm Analysis: Asymptotic Analysis-Solving Recurrence Equations-Algorithm Design Techniques-Greedy Algorithms-Dynamic Programming-Divide and Conquer.

UNIT III: DATABASE MANAGEMENT SYSTEMS (10 Questions)

INTRODUCTION TO DBMS – File Systems Organization – Purpose of Database System – Database System Terminologies – Database Characteristics – Data models – Types of data models – Components of DBMS. LOGICAL DATABASE DESIGN: Relational DBMS – Codd's Rule – Entity – Relationship model – Extended ER Normalization – Functional Dependencies, Anomaly – 1 NF to 5 NF - SQL– SQL Standards – Data types – Database Objects – DDL – DML – File Organization – Organization of Records in Files – Indexing and Hashing – Ordered Indices.

UNIT IV: OPERATING SYSTEMS AND COMPUTER NETWORKS (30 Questions)

OPERATING SYSTEMS OVERVIEW – Computer System Overview – Basic Elements, Instruction Execution, Interrupts, Memory Hierarchy, Cache Memory, Direct Memory Access, Multiprocessor and Multicore Organization. Operating system overview – objectives and functions, Evolution of Operating System – Computer System Organization – Operating System Structure and Operations –System Calls, System Programs, OS Generation and System Boot – PROCESS MANAGEMENT – Processes – Process Concepts, Process Scheduling, Operations on Processes, Interprocess Communication; Threads – Overview, Multicore Programming, Multithreading Models; CPU Scheduling and Deadlocks – STORAGE MANAGEMENT – Main Memory – Contiguous Memory – Allocation, Segmentation, Paging, 32 and 64 bit architecture Examples; Virtual Memory – Demand Paging, Page Replacement, Allocation, Thrashing; I/O SYSTEMS – Mass Storage Structure – Overview, Disk Scheduling and Management; File System Storage – File Concepts, Directory and Disk Structure, Sharing and Protection; File System Implementation – File System Structure, Directory Structure, Allocation Methods, Free space Management; I/O Systems.

NETWORKING FUNDAMENTALS –Building a network- requirements – Layering and protocols – Internet Architecture - Performance; Link layer Services – Framing – Error Detection – Flow control – Media access control- Ethernet (802.3) – wireless LANs -802.11 – Bluetooth – switching and bridging – Basic Internetworking (IP, CIDR, ARP, DHCP, ICMP)- ROUTING – Routing (RIP, OSPF, metrics) – Switch basics – Global Internet (Areas, BGP, IPv6), TRANSPORT LAYER – Overview of Transport layer – UDP- Reliable byte stream (TCP) – Connection management – Flow control – Retransmission – TCP Congestion control, APPLICATION LAYER - Electronic Mail (SMTP, POP3, IMAP,MIME) – HTTP – Web Services - DNS –SNMP.

UNIT V: SIGNAL PROCESSING AND COMMUNICATION SYSTEMS (20 Marks)

Characteristics and classifications of Continuous and Discrete Time signals – CT signal analysis – Fourier Series, Fourier Transform and Laplace Transform. Sampling theorem, Discrete Time signal analysis – DTFT and Z-Transform. CT and DT systems – Impulse response and convolution, Frequency response, Transform domain analysis using FT, LT, DTFT, DFT, FFT and ZT – IIR filters: Butterworth and Chebyshev filters, Impulse invariant and Bilinear transformation methods, FIR filter: Linear phase design, Windowing techniques: Rectangular, Bartlett, Hanning and Hamming, Digital Filter realization structures, Finite word length effects in IIR and FIR filters, Scaling, Decimation and interpolation.

Random Processes: Auto correlation, Power spectral density, White noise, Filtering of random signals through LTI systems. Analog Communication: Amplitude and angle modulation / demodulation, Spectral characteristics. Noise: Thermal noise, Noise figure and Noise temperature. Digital Communication: PCM, DPCM, ADPCM, DM, ADM, LPC. Line coding schemes, Bandpass signaling: Binary and M-ary versions of ASK, PSK, FSK, BER and spectral characteristics. Principles of QAM, OQPSK, MSK, GMSK. Link budget calculations, Eye diagram, ISI, Symbol and carrier synchronization, Frame synchronization.

Information Theory and coding: Entropy, Mutual information, Channel capacity (AWGN), Source coding and Channel coding techniques.

UNIT VI: ANALOG AND DIGITAL ELECTRONICS (20 Questions)

Operation and Characteristics of electronic devices: PN Junction Diodes, Zener Diode, BJT, JFET, IGBT and MOSFET, Biasing circuits - BJT and MOSFET amplifiers - Small signal analysis and frequency response, Differential, Darlington, Cascade, Cascode amplifiers, Feedback amplifiers, Tuned amplifiers, RC and LC oscillators, Power amplifiers. Rectifiers and wave-shaping circuits, Operational amplifier characteristics and applications, CMRR, slew rate, waveform generators, active filters, timers, PLL, VCO, ADC, DAC, Regulators and Converters.

Number representations: Binary, Integer and Floating point numbers, Boolean Algebra and Logic Gates – Combinational logic circuits, Boolean algebra, Minimization of functions using Boolean identities and Karnaugh map, Logic gates and their static CMOS implementations, Arithmetic circuits, Code converters, Multiplexers, Decoders, Functional Units of a Digital Computer - Arithmetic operations : Addition and Subtraction – Binary Multiplication – Binary Division. Sequential logic circuits: Latches and flip-flops, Counters, Shift registers, Finite state machines, Propagation delay, Setup and hold time, Critical path delay. Data converters: Sample and hold circuit, ADC and DAC. Semiconductor memories: ROM, SRAM, DRAM.

UNIT VII: ELECTRICAL CIRCUITS, MACHINES AND MEASUREMENTS (20 Questions)

Ohm's Law - Kirchhoff's Laws – Solution of DC circuits with Independent sources only (Steady state), AC Fundamentals: Waveforms, Average value, RMS Value, Impedance, Instantaneous Power, Real Power, Reactive Power and Apparent Power, Power Factor – Steady State Analysis of RL, RC and RLC Circuits- three phase circuits.

Magnetic Circuits– DC Machines: Construction, Working Principle, Types and Applications of DC Generator and Motor, EMF and Torque equation. AC Machines: Construction, Working and Applications of Transformer, Three phase Alternator, Synchronous motor, Single and Three Phase Induction Motor, stepper motor, servo motor and BLDC motor.

Solenoids, electro-pneumatic systems, proximity sensors, limit switches, piezoelectric, Hall Effect, photo sensors, Strain gauge, LVDT, piezo electric crystals, differential pressure transducer, optical and digital transducers, Smart sensors, Thermal Imagers.

Moving Coil and Moving Iron Instruments, Power Measurement, Energy Meter, Instrument Transformers - CT and PT, Multimeter- DSO- Data Acquisition Systems – A/D and D/A Converters –Data Transmission Systems – smart meters.

Single and Three Phase AC to DC Converters – uncontrolled and controlled rectifiers– Switched Mode Power Supplies – buck, boost and buck-boost converter topologies –switching losses – Inverters – Single and Three Phase Inverters – Voltage control –Pulse Width Modulation techniques – harmonic elimination techniques – Uninterrupted Power Supplies- Batteries – types and characteristics.

UNIT VIII: MICROPROCESSOR AND EMBEDDED SYSTEMS (20 Questions)

8085 Architecture, Instruction set, addressing modes, Assembly language programming, Interrupts, timing diagrams, memory and I/O interfacing; 8086 Architecture, Instruction set, addressing modes, minimum and maximum mode configuration, assembler directives, assembly language programming, interrupts; 8051 Architecture, Special Function Registers (SFRs) instruction set, addressing modes, assembly language programming, I/O ports, Timers/counters, interrupts and serial communication. Embedded System design process, Embedded processors – ARM Processor – Architecture, ARM Instruction sets – Addressing Modes – Pipelining – Embedded C Programming – Looping Structures – Register Allocation – Function calls – Pointer aliasing – Structure arrangement – bit fields – unaligned data and endianness – inline functions and inline assembly – portability issues. Profiling and cycle counting – instruction scheduling – optimized primitives. Multiple tasks and processes – Context switching – Scheduling policies – Interprocess communication mechanisms – Exception and interrupt handling – Performance issues. Meeting real time constraints – Multi-state systems and function sequences – Embedded software development tools – Emulators and debuggers.

UNIT IX: MECHANIC OF MATERIALS AND MATERIAL SCIENCE (20 Questions)

Basics of Mechanisms, Kinematics of Mechanisms, Gyroscope, Gears and Gear Trains, Fly Wheels, Friction in Machine Elements, Stress, Strain and Deformation of Solids, Design of Shafts and Couplings, Design of Bearings, Constitution of alloys and phase diagrams, Iron Carbide Phase Diagram, steels, cast iron, phase transformations- diffusion-TTT diagram, ferrous and nonferrous alloys, heat treatment of ferrous and non-ferrous metal, surface modification techniques, powder metallurgy, non-metallic materials, mechanical properties and testing, semi conducting materials, magnetic and dielectric materials, Engineering ceramics, Engineering and commodity polymers, composites, nano-materials.

UNIT X: MANUFACTURING PROCESS AND INDUSTRIAL ENGINEERING (20 Questions)

Foundry Technology, Metal Forming Processes –Manufacturing of Thermo Setting and Thermo Plastic Products, Machinability machine tools - center lathe, drilling, milling, grinding, gear cutting and broaching, Machining Time Calculation, unconventional machining processes, CNC machine tools, Manual Part Programming - Machining and Turning Centre, Non Destructive Testing (NDT), Production Planning and Control, Cellular Manufacturing, Flexible Manufacturing System and Automated Guided Vehicle System, Additive Manufacturing, inventory control, ABC Analysis material handling systems, operations research, Linear Programming, simplex method, Transportation model, Assignment model Critical Path Method (CPM) and Program Evaluation Review Technique (PERT), Queuing Models.

11.Engineering (UG Degree Standard) and Business Administration (PG Degree Standard)- (Infrastructure)

Code: 474

UNIT I: ENGINEERING PHYSICS AND CHEMISTRY (20 Questions)

Mechanics: Newton's laws of motion – gravitation – work, energy and power – Properties of matter: Elasticity – moduli of elasticity – Sound: intensity level – reverberation – Ultrasonics : production, detection and applications – Quantum Physics : Photoelectric effect – dual nature of matter and radiation – Heisenberg's uncertainty principle – Schrödinger's wave equation.

Water – Sources – Classifications – Softening process – Desalination – RO Method – Internal treatment – Treatment of Water for Municipal purposes. Plastics – High polymer – classification – Polymerization techniques – Thermoplastics – Thermosetting resins – examples. Rubber –Types of Rubber – Vulcanisation – Properties – Unvulcanised and Vulcanised. Natural Rubber – Synthetic Rubber – examples. Refractories – Classification – Manufacture of Refractories – Magnesite – Silica – Zirconia – Chromite. Abrasives – Natural – Artificial–Abrasive paper & cloth. Corrosion: Dry and Wet corrosion – Factors affecting corrosion – Different types of corrosion. Productive coating – Hot dipping– metal cladding, electro deposition – Organic Coatings – Paints – Varnishes. Cement and lime – setting and hardening.

UNIT II: ENVIRONMENTAL SCIENCE AND ENGINEERING (20 Questions)

Environmental Pollution: Causes, Effects and Preventive measures of Water, Soil, Air and Noise Pollutions. Solid, Hazardous and E-Waste management. Sustainability and management – Development, GDP. Sustainability – concept, needs and challenges – economic, social and aspects of sustainability–from unsustainability to sustainability – millennium development goals, and protocols– Sustainable Development Goals – targets, indicators and intervention areas. Climate change –Global, Regional and local environmental issues and possible solutions. Concept of Carbon Credit – Carbon Footprint. Environmental management in industry – Material Life cycle assessment, Environmental Impact Assessment. Sustainable habitat: Energy efficiency, Sustainable transports. Sustainable energy: Non-conventional Sources, Energy Cycles, carbon cycle, emission and sequestration: Sustainable urbanization – Socio-economical and technological change.

UNIT III: CIVIL ENGINEERING (20 Questions)

Properties and Classification of cement, lime, bricks, stone and timber – Uses and Tests – materials for acoustics and insulation – Simple stress and strain – elastic constants – relationship – stress and strain in two dimensions, compound stresses– principal stresses – Bending moments and shear forces in statically determinate beams– simple bending theory – Green Building Concept – Types of concrete – testing of fresh and hardened concrete – mix design – quality control – special concreting techniques – concreting equipment – centering and shuttering – slip and moving forms – construction joints – Design of tension and compression members, beams and beam-columns, column bases – Design of bolted and welded connections – Construction management – Construction planning and scheduling – preparation of different types of schedules – methods of scheduling – resource planning– Construction Contracts – Types of estimates – Detailed estimates for different types of buildings –methods of valuation – depreciation – fixation of rent– rate analysis– Quantity estimation.

UNIT IV: TOWN / URBAN PLANNING (20 Questions)

Planning System in India, Regional Plan, Master Plan, Structure Plan, Detailed Development Plans, City Corporate Plan and Smart City Plan – Principles of Planning – Type of planning surveys, data identification for various plan preparation – Urban infrastructure – Water Supply, Sewage / Drainage services, Solid Waste Management, Roads and Street Lighting – Basics of Remote Sensing and GIS– Classification of spatial and non-spatial data, application of spatial data in urban and regional planning – Concepts of sustainable urban development, sustainable transportation – Land Pooling concept, Transfer of Development Right, Formulation of Re-development and Urban Expansion Plans – Local Area Plans, Town Planning Schemes – Special Economic Zone, Industrial Corridor, Coastal Zone Management Plan.

UNIT V: ARCHITECTURE, BUILDING SYSTEMS AND SERVICES (20 Questions)

Elements of Architecture – Form, Space, light, colour etc., Principles of Architecture – Proportion, Scale, balance, rhythm, symmetry, hierarchy, pattern and axis. Understanding of organization of form and space, volumetric study, architectural characteristics & style of buildings with examples. Understanding user circulation and spatial requirement for all types of buildings. Universal design principles and Barrier free environment. Computer application in Architecture – Architectural graphics – Drawing & visualization tools – image editing, 2D & 3D modelling, 3D visualization. Water harvesting system, storm water drainage system, solid waste management, building management system, lighting, Air-conditioning, Vertical transportation system, fire safety and firefighting systems.

UNIT VI: PROJECT MANAGEMENT (20 Questions)

Types of Project – Project Life Cycle – Project Planning– Feasibility Analysis– Project Proposal – Project Designing and Design Review – Project Scheduling Techniques – PERT–CPM – Resource Allocation and Management – Cost and Quality Control – Project implementation – Contracts –Types of Contracts – Partnering Private Public Partnership (PPP) and Innovative Concepts and Practices in Project Management – Project Reporting and Evaluations – Legal Implications of Contracting and Partnering – Project uncertainty and Risk Management – GANTT Chart – Expediting a project.

UNIT VII: MANAGERIAL ECONOMICS (20 Questions)

Nature and Scope of Managerial Economics – Role of Economic Analysis in Managerial Decision – Demand Analysis of Estimation – Determination of Demand – Demand Forecasting – Forecasting

Techniques – Supply and Demand analysis – Long and Short Run Production Functions – Long and Short Cost Functions – Pricing Strategies – Price Discriminations – Concept of Profit – Profit Planning and Control Cost Volume Analysis – Macro Economic Indicators – Macro Economic Aggregate – National Income and Economic Welfare – Multiplier Effect – Fiscal Policy – Economic Indicator and Business Decision Making – Business Strategy Development – Market Structure.

UNIT VIII: OPERATIONS AND FACILITY MANAGEMENT (20 Questions)

Operations Management – Objectives and Types – Characteristics of Modern Operation Management – Operation Strategy – Supply Chain Management – Warehousing and Supply Chain Strategies – Supply Chain Dynamics – Operation Planning – Work Measurements and Productivity – Total Productive Maintenance – Materials Management and Purchase Management – Total Quality Management(TQM) – Concept – Quality Standards and Certification – Quality Assurance.

Facility Management as Business Function – Facility Planning and Budgeting – Space Forecasting and Planning – Space Management Lease Administrations and Property Management – Facility Security Planning and Implementation.

UNIT IX: PROJECT INFORMATION SYSTEM (20 Questions)

Role of MIS in Decision Making – Enterprise Resource Planning (ERP)– e-Tender (e-Procurement) – Tamil Nadu Transparency in Tender Rules Act 1998 – e-Commerce Concept and Models – B2B, B2C – Cyber Security and Data Privacy– Patents – e-Auditing of Project.

UNIT X: PROJECT FINANCIAL MANAGEMENT (20 Questions)

Financial Statements – Elements of Costs – Methods and types of Costing – ABC Costing – Marginal Costing and CVP Analysis – Standard Costing – Modern techniques of Performance Measurement – Financial Statement Analysis – Ratio Analysis – Cash Flow and Fund Flow Analysis – Working Capital Management – Capital Budgeting – Risk and Uncertainty in decision making – Inflation adjusted Capital Budgeting.

12.Engineering (UG Degree Standard) and Business Administration (PG Degree Standard) - (Project Management)

Code: 475

UNIT I: ENGINEERING PHYSICS AND CHEMISTRY (20 Questions)

Mechanics: Newton's laws of motion – gravitation – work, energy and power – Properties of matter: Elasticity – moduli of elasticity – Sound: intensity level – reverberation – Ultrasonics: production, detection and applications – Quantum Physics : Photoelectric effect– dual nature of matter and radiation – Heisenberg's uncertainty principle – Schrödinger's wave equation.

Water – Sources – Classifications – Softening process – Desalination – RO Method – Internal treatment – Treatment of Water for Municipal purposes. Plastics – High polymer – classification – Polymerization techniques – Thermoplastics – Thermosetting resins – examples. Rubber –Types of Rubber – Vulcanisation – Properties – Unvulcanised and Vulcanised. Natural Rubber – Synthetic Rubber – examples. Refractories – Classification – Manufacture of Refractories – Magnesite – Silica – Zirconia – Chromite. Abrasives – Natural – Artificial–Abrasive paper & cloth. Corrosion: Dry and Wet corrosion – Factors affecting corrosion– Different types of corrosion. Productive coating – Hot dipping– metal cladding, electro deposition – Organic Coatings – Paints – Varnishes. Cement and lime – setting and hardening.

UNIT II: BASICS OF COMPUTER ENGINEERING (20 Questions)

Computer Organization – CPU and Microprocessor [ALU, Control Unit and Bus Structure]–Data Storage [Primary, Secondary and Virtual] – Input and Output Devices. System Software – Assembler – Compiler – Loader – Linker – Operating Systems. Programming Languages – Classification of Programming Language, Algorithm, Flow chart, Pseudo code, High-Level Languages – Fundamental concepts of C Programming. Basic Computer Networking – Network Components [Routers, Bridges, Gateways] – ISO–OSI Reference Model – LAN – WAN – Client–Server Architecture – Internet –

World Wide Web. Applications – Office Tools – Word processor – Spreadsheet – Power point – Introduction to Database concepts – E-mail – Browser. IT Enabled Services –E-Governance – Multimedia.

UNIT III: BASICS OF CIVIL AND MECHANICAL ENGINEERING (20 Questions)

Introduction to Engineering mechanics – Units and Dimensions – Laws of Mechanics – Coplanar Forces – Static Equilibrium of Rigid body – Moment of force – free body diagram – friction–laws of friction – sliding friction – wedge friction – Rolling resistance – Lader friction– Friction in screws – Screw jack – Belt friction – Properties of surfaces and solids – Centroids and centre of mass – line and areas – Rectangular, circular, triangular areas by integration – T-section, I-Section, Angle section, Hollow section – Area moment of inertia of plane areas – Parallel axis theorem – Perpendicular axis theorem, Polar moment of Inertia, Principle moment of Inertia, Mass moment of inertia – Centroid of simple solids – Dynamics of particle – Displacement, velocity and acceleration – Different types of motion – Rectilinear, Curvilinear and Projectile motions.

UNIT IV: BASICS OF ELECTRICAL AND ELECTRONICS ENGINEERING (20 Questions)

Ohm's law – Kirchoff's laws – Introduction to DC and AC circuits – single phase and three phase circuits – Power and Power factor, Unbalanced and Balanced loads, Operating principles of moving coil and moving iron instruments (voltmeters and ammeters) – wattmeters, multimeter, energy meters and megger, Construction and principle of operation: DC motors – DC generators –Transformers – Induction motors, Characteristics of PN junction diode – zener diode – half wave and full wave rectifiers – Bipolar junction transistor (CC,CE,CB configurations), SCR, Amplifiers–Operational amplifiers – Inverting and Non-inverting amplifiers, Binary number system – logic gates –Boolean algebra – Half and full adders – Flip-flops–registers and counters –A/D and D/A conversion, Types of analog and digital signals – Modulation and Demodulation (amplitude and frequency). Communication systems: Radio – TV – Fax – Microwave – Satellite and optical fibre.

UNIT V: ENVIRONMENTAL SCIENCE AND ENGINEERING (20 Questions)

Environmental pollution: Causes, Effects and Preventive measures of Water, Soil, Air and Noise Pollutions. Solid, Hazardous and E-Waste management. Sustainability and management – Development, GDP. Sustainability – concept, needs and challenges – economic, social and aspects of sustainability–from unsustainability to sustainability – millennium development goals, and protocols – Sustainable Development Goals – targets, indicators and intervention areas. Climate change– Global, Regional and local environmental issues and possible solutions. Concept of Carbon Credit, Carbon Footprint. Environmental management in industry – Material Life cycle assessment, Environmental Impact Assessment. Sustainable habitat: Green materials, Energy efficiency, Sustainable transports. Sustainable energy: Non-conventional Sources, energy cycles, carbon cycle, emission and sequestration. Green Engineering: Sustainable urbanization– Socio-economical and technological change.

UNIT VI: PROJECT MANAGEMENT (20 Questions)

Types of Project – Project Life Cycle – Project Planning – Feasibility Analysis – Project Proposal – Project Designing and Design Review – Project Scheduling Techniques – PERT – CPM – Resource Allocation and Management – Cost and Quality Control – Project implementation –Contracts –Types of Contracts – Partnering Private Public Partnership (PPP) and Innovative Concepts and Practices in Project Management – Project Reporting and Evaluations – Legal Implications of Contracting and Partnering – Project uncertainty and Risk Management – GANTT Chart – Expediting a project

UNIT VII: MANAGERIAL ECONOMICS (20 Questions)

Nature and Scope of Managerial Economics – Role of Economic Analysis in Managerial Decision – Demand Analysis of Estimation – Determination of Demand – Demand Forecasting – Forecasting Techniques – Supply and Demand analysis – Long and Short Run Production Functions – Long and Short Cost Functions – Pricing Strategies – Price Discriminations – Concept of Profit – Profit Planning and Control Cost Volume Analysis – Macro Economic Indicators – Macro Economic Aggregate – National Income and Economic Welfare – Multiplier Effect – Fiscal Policy – Economic Indicator and Business Decision Making – Business Strategy Development – Market Structure.

UNIT VIII: OPERATIONS AND FACILITY MANAGEMENT (20 Questions)

Operations Management – Objectives and Types – Characteristics of Modern Operation Management – Operation Strategy – Supply Chain Management – Warehousing and Supply Chain Strategies – Supply Chain Dynamics – Operation Planning – Work Measurements and Productivity – Total Productive Maintenance – Materials Management and Purchase Management – Total Quality Management (TQM) – Concept – Quality Standards and Certification – Quality Assurance.

Facility Management as Business Function – Facility Planning and Budgeting – Space Forecasting and Planning – Space Management Lease Administrations and Property Management – Facility Security Planning and Implementation.

UNIT IX: PROJECT INFORMATION SYSTEM (20 Questions)

Role of MIS in Decision Making – Enterprise Resource Planning (ERP) – e-Tender (e-Procurement) – Tamil Nadu Transparency in Tender Rules Act 1998 – e-Commerce Concept and Models – B2B, B2C – Cyber Security and Data Privacy – Patents – e-Auditing of Project.

UNIT X: PROJECT FINANCIAL MANAGEMENT (20 Questions)

Financial Statements – Elements of Costs – Methods and types of Costing – ABC Costing – Marginal Costing and CVP Analysis – Standard Costing – Modern techniques of Performance Measurement – Financial Statement Analysis – Ratio Analysis – Cash Flow and Fund Flow Analysis – Working Capital Management – Capital Budgeting – Risk and Uncertainty in decision making – Inflation adjusted Capital Budgeting.

13. Environmental Science (Degree Standard)

Code: 298

UNIT I: SCOPE AND IMPORTANCE OF ENVIRONMENTAL SCIENCE (25 Questions)

Definition; multidisciplinary nature of environmental science, scope and importance; global environmental problems; components of environment: biotic, abiotic. Atmosphere. Lithosphere: case study on major geological formations in Tamil Nadu; Hydrosphere case study on major river systems in Tamil Nadu.

UNIT II: ECOLOGICAL CONCEPTS (15 Questions)

Ecosystem definition; structure and function; energy flow, food chain and food web; ecological pyramids, biogeochemical cycles (Carbon, Nitrogen and Phosphorus); Hydrological cycle; ecosystem types: ponds, ocean, river, cropland, wetland, desert, forests and grassland; ecological succession; primary, secondary and tertiary producers. Examples of plant and animal adaptations for arid (desert and semi-desert) and humid (rain forest) biomes.

UNIT III: ENVIRONMENTAL RESOURCES (25 Questions)

Non-renewable resources - Mineral use and exploitation; fossil fuels. Renewable resources: water – surface and ground water, supply, demand, dams-benefits and problems; soil and land resources – Structure, formation, erosion, conservation of soil, agricultural practices, land use, land degradation, desertification; Fisheries – inland and marine fisheries, aquaculture, overharvesting. Forest resources – Timber, medicinal plants, fuel-wood, deforestation, forest management. Management of renewable and non-renewable resources; sustainable use.

UNIT IV: BIODIVERSITY AND CONSERVATION (15 Questions)

Biodiversity - Definition; Introduction to genetic, species and ecosystem diversity; bio geographical classification of India : Forest types of Tamil Nadu : tropical dry evergreen, thorny scrub, wet evergreen forests, grasslands, sholas, dry and mixed deciduous forests, mangroves. Coral reefs. Agro-biodiversity, land races and genetic resources. Valuation of bio diversity; Consumptive, productive, cultural value. Threats to biodiversity: habitat loss, poaching, over-utilisation, invasive species. Endemic and threatened species of Tamil Nadu. In situ conservation: Mudumalai, Anamalai and Kalakad-Mundanthurai Tiger Reserves, Gulf of Mannar Marine Reserve, Pulicat and Pt. Calimere Wildlife Sanctuaries; sacred groves. Ex-situ conservation: Vandalur Zoological Park and Madras Crocodile Bank. Red data book, National Biodiversity Act, Wildlife Protection Act (1972), Tamil Nadu Forest Conservation Act.

UNIT V: HUMAN POPULATION AND ENVIRONMENT (15 Questions)

Population growth and regulation: Age pyramids, Malthusian theory, global trends of population growth, variation among nations and zero population growth. Environmental health, Nutrition and health. Communicable diseases such as typhoid, cholera, tuberculosis, hepatitis, influenza, HIV- social issues. Non- communicable diseases such as heart disease, diabetes, asthma. Epidemics. Environmental risk factors. Human displacement and rehabilitation, tribal population and welfare schemes, women and child welfare; Human rights, Intellectual Property Rights.

UNIT VI: NATURAL CATASTROPHIES AND DISASTER MANAGEMENT (15 Questions)

Causes and effects of natural catastrophies – Earthquakes, floods, cyclones, hurricanes, storms, landslides, drought, famine, tsunami; pre-disaster and post - disaster management, risk assessment, early warning systems and forecasting. Role of administrators, scientists, planners, volunteers.

UNIT VII: ENVIRONMENTAL POLLUTION (25 Questions)

Definition of pollution and pollutants; types of pollution -Air, water, soil, noise, thermal, nuclear; causes of pollution, effects of pollution and control measures; liquid and solid waste management, nuclear holocausts. Case studies: leather industry, fly ash, thermal stations, nuclear power plants.

UNIT VIII: ENVIRONMENTAL MANAGEMENT AND LEGISLATION (25 Questions)

Environmental Impact Assessment (EIA) : Objectives, Principles of Process, screening of projects, methodologies, checklist and documentation, prediction methodologies, public participation, limitation of EIA ; Environmental Protection Acts in India : air, water. Lake and River action programmes; coastal zone management; pollution control boards, Management plans using Geographic Information System (GIS) and Remote Sensing (RS) tools.

UNIT IX: ENVIRONMENTAL ORGANISATIONS AND AGENCIES (15 Questions)

International Organisations: United Nations Environment Programme (UNEP), International Union for Conservation of Nature and Natural Resources (IUCN), International Panel on Climate Change (IPCC), International Panel on Oceans (IPO), Earth Summit, Convention on Biological Diversity (CBD), World Wide Fund for Nature (WWF), Man and Biosphere Programme (MAB), India: Ministry of Environment, Forests and Climate Change (MoEFCC), Ministry of Earth Sciences (MoES), NGO's.

UNIT X: GLOBAL CLIMATE CHANGE (25 Questions)

Introduction to climate change, past climatic fluctuations. Current climate and weather – Wind, monsoon, cyclones. Global ocean circulation. Global warming and greenhouses gases – Carbon dioxide, methane, nitrous oxide, ozone. Sources of green house gases – Fossil fuel use, vehicle emissions, industry; agricultural practices, deforestation. Role of UNFCCC (United Nation Framework Convention on Climate Change) in monitoring green house gas emissions. International treaties: Kyoto protocol, Paris agreement. Acid rain, source, impacts and management. Ozone layer depletion: causes, impacts and remediation.

14. Financial and Cost Accountancy (Final)

CODE: 434

UNIT I: ACCOUNTING (30 Questions)

- (i) Accounting Standards – GAAP - AS - applicability, interpretation, scope and compliance-IFRS- Ind AS 2, 10, 115, 16, 21, 20, 23, 37 & 38.
- (ii) Company Accounts - Presentation of Financial Statements as per Schedule III of Companies Act 2013 - Statement of Profit or Loss, Balance Sheet, Change in Equity, Cash flow statement
- (iii) Accounting of Banking, Electricity and Insurance Companies
- (iv) Accounting for Cooperative Societies
- (v) Branch and Departmental Accounts (including foreign branches)
- (vi) Accounting for non-profit organisations and incomplete records
- (vii) Computerised Accounting System (ERP features and advantages)

UNIT II: AUDITING (30 Questions)

- (i) Nature and scope and significance of auditing
- (ii) Audit Engagement, Audit Programme, Audit working papers , Audit note book audit evidence and audit report
- (iii) Internal check, internal control and internal audit- industry specific
- (iv) Reporting requirements under companies act - report vs certificate, contents of the report and qualifications in the report.
- (v) Cost audit and Secretarial audit
- (vi) Auditing of different types of undertaking - education, hospitals, cooperative societies, trusts.

UNIT III: FINANCIAL MANAGEMENT (25 Questions)

- (i) Meaning-objectives -scope of financial management
- (ii) Sources of Funds- Introduction of Financial Markets- Capital & Money Markets
- (iii) Tools for Financial Analysis - Ratio, Funds flow analysis, Cash flow analysis
- (iv) Cost of Capital, Capital Structure and Leverages
- (v) Working Capital Management- Financing - Cash, Inventory, Receivables and Payables
- (vi) Capital Budgeting.
- (vii) Risk Management - risk measurement- risk analysis- Value at Risk(VAR)- Capital Adequacy Norms & Income Recognition Norms (NPA) in NBFCs.

UNIT IV: TAXATION (30 Questions)

- (i) Direct Taxation- Residential Status- Heads of Income and Computation of Total Income under various heads- assessment of income of different persons - TDS/TCS/Advance Tax- Income Computation and Disclosure standards (Basic Concepts only) - Taxation as applicable to Government undertaking and Cooperative Societies. Due dates and compliances. Effects of non compliance and penalty. Tax audit provisions under I.T. Act
- (ii) Indirect Taxation- Canons of Taxation- Customs Law - Goods and Services Tax (GST) - CGST- SGST-IGST- Cess - Registration - Supply- Time of Supply- Value of Supply- Place of Supply- E-Invoicing, E-Way Bill, Input tax credit- Reverse Charge Mechanism (RCM) - Payment of Taxes, Penalties.

UNIT V: COMMERCIAL LAW, INDUSTRIAL LAW AND COMPANY LAW (20 Questions)

- (i) MSMED Act 2006.
- (ii) Laws and Regulations relating to Cyber Security and Data Protection.
- (iii) Factories Act
- (iv) Payment of Gratuity Act
- (v) Employees Provident Fund Act 1952
- (vi) Employees State Insurance Act 1948
- (vii) Payment of Bonus Act 1965
- (viii) Minimum Wages Act 1948
- (ix) Companies Act 2013-Promotion - Formation and related procedures – Types – Appointment and duties of Directors, Loans and Deposits, CSR, Salient features of Insolvency and Bankruptcy Code.

UNIT VI: MANAGEMENT ACCOUNTING (15 Questions)

- (i) Introduction to Management Accounting - Relationship between Management accounting and cost accounting- Decision Making tools
- (ii) Analysis and Interpretation of Financial Statements
- (iii) Learning Curve - concepts and its application

UNIT VII: COST MANAGEMENT (10 Questions)

- (i) Life Cycle costing
- (ii) Target Costing
- (iii) Kaizen Costing
- (iv) Value analysis and Engineering
- (v) Throughput Costing
- (vi) Business Process Re-engineering
- (vii) Back flush costing
- (viii) Activity Based Costing (ABC).

UNIT VIII: DECISION MAKING TECHNIQUES (15 Questions)

- (i) Marginal Costing - CVP analysis - Profit Volume Graph- Decision involving alternative choices - Make or Buy; Evaluation of Orders; Multiple scarce: Product sales
- (ii) Pricing Decisions - New Product pricing- use of costs in pricing - sensitivity analysis - monopoly pricing - competitive pricing- Transfer pricing - Costing of Service Sectors
- (iii) Variance Analysis and Reporting- Material, Labour, Overheads, Turnover and Profit.

UNIT IX: PERFORMANCE EVALUATION AND IMPROVEMENT TOOLS (15 Questions)

- (i) Balanced Score Card
- (ii) Supply Chain Management
- (iii) Key Performance Indicators (KPI) like ROI, Economic Value Added (EVA).
- (iv) Bench Marking
- (v) Six sigma, Statistical Quality Control
- (vi) Plan-Do-Check Action
- (vii) Management Information Systems (MIS)
- (viii) Total Productivity Management (TPM) and Total Quality Management (TQM)
- (ix) SWOT analysis
- (x) Profitability Analysis.

UNIT X: BUSINESS VALUATION (10 Questions)

- (i) Meaning of Value, Valuation and Business Valuation
- (ii) Valuation Methods - Non Discounted cash flow method- Discounted Cash Flow Method - Free Cashflow Method, Net Present Value Method (NPV)- Profitability Index Method(PI) - Internal Rate of Return Method (IRR)
- (iii) Valuation of Inventory
- (iv) Valuation of Investments
- (v) Valuation of Intangibles
- (vi) Valuation of Human Resources
- (vii) Valuation of Equity

15. Law (Degree Standard)

Code: 414

UNIT I: CONSTITUTIONAL LAW AND HUMAN RIGHTS (20 Questions)

Defining Constitution, Constitutional Law, Constitutionalism, Transformative Constitutionalism – Constitutional Conventions - Salient features of the Indian Constitution, Concept of State – Writs - Judicial Review – Fundamental Rights – Directive Principles of State Policy–Fundamental Duties – Contractual and Tortious liability of the State – Compensatory Jurisprudence – Services – Administrative Tribunals – Right to Information– Role of Judiciary and Human Rights – National and State Human Rights Commissions.

UNIT II: JURISPRUDENCE (15 Questions)

Evolution of Law – Ancient India, Greek and Roman Civilization – Law, Morals, Ethics and Justice–Nature of law – Functions of Law – Rule of Law - Authority - Autonomy - Anarchy - Obligation - Opinion - Dictum– Law as a Social Fact-Nature and Scope of Jurisprudence – From Police State to Welfare State.

Schools of Jurisprudence – Analytical – Historical – Philosophical – Sociological - Western Thoughts and Indian Jurisprudence – Social Transformation and Social Justice - Local Law & Global Law - Civil Law & Common Law - Cultural & Technical aspects - Micro & Macro aspects.

Definition of Law – Kinds of Law – Nature and Functions of State – State and Sovereignty – Relationship with Law and State - Sources of Law – Classical and Modern Sources – Convention, Custom, Legislation, Precedent and its kinds – Stare Decisis, Ratio Decidendi and Obiter Dicta - Administration of Justice – Complete Justice – Theories of Justice.

Meaning, Definition and kinds of Rights and Duties – Jural Correlatives and Jural Opposites - Person and its kinds – Status and Theories of Corporate personality - Title and its kinds – Ownership– meaning and its kinds – Possession – meaning and its kinds - Liability – meaning and its kinds – Negligence –

meaning and its kinds – Obligation—meaning and its kinds – Law of Procedure – Elements of Judicial Procedure – Evidence - Property – Meaning and its kinds.

Application of Law and Interpretation of Law - Codification of Customary Law and Enforcement mechanism – Writ Remedies – Public Interest Litigation – Justice Delivery System – Judicial Activism and Judicial process.

UNIT III: LAW RELATING TO INDUSTRIAL RELATIONS (15 Questions)

Industrial Disputes Act, 1947 – Definitions – Industry, Industrial Dispute, Workman – Appropriate Government - Authorities – Investigation and Dispute Settlement machineries – Conciliation - Arbitration – Adjudication – Reference of disputes – Conciliation Board – Conciliation Officer – Labour Court– Tribunal, National Tribunal–Court of Inquiry–Award–Settlement– powers of the adjudicatory authorities - Strike, Lock-out - Lay-off, Retrenchment, Closure and Transfer of undertaking - Unfair Labour Practices - Recovery of money due from an Employer – Penalties.

Trade Unions Act, 1926 – Definitions – Registration of Trade Unions – Members – Office Bearers – Rights and Liabilities – Privileges and Immunities – Recognition of Trade Union.

Industrial Employment (Standing Orders) Act, 1946– Appointment, Jurisdiction, Powers and Duties of Certifying officers – Procedure for certification of Standing Orders – Operation and Binding Effect of Certified Standing Orders–Modification–Appeal–Registration Of Standing Orders– Temporary Application of Model Standing Orders – Interpretation of Standing Orders - Subsistence Allowance.

Misconduct – Domestic Enquiry and Disciplinary Proceedings – Appropriate Relief in case of Termination, Discharge, Dismissal.

UNIT IV: LAW RELATING TO WAGES (15 Questions)

Payment of Wages Act, 1936 – Definitions - Obligations of the Employer– Deductions – Authorities– Settlement of Claims – Inspectors – Powers – Offences and Penalties.

Minimum Wages Act, 1948– Definitions– Fixation and Revision of minimum rates of wages – Methods – Committees and Advisory Boards – Settlement of Claims - Inspectors – Offences and Penalties.

Payment of Bonus Act, 1965– Definitions – Coverage – Kinds of Bonus – Eligibility and extent of bonus – Calculation of Bonus – Available and Allocable surplus – Set on and Set off – Forfeiture of Bonus – Recovery of Bonus – Powers and Functions of Inspectors.

Equal Remuneration Act, 1976– Definitions – Duty of employer – Work of same and similar nature – Advisory Committee - Hearing and deciding claims and complaints – Inspectors – Penalties.

UNIT V: LAW RELATING TO SOCIAL SECURITY (15 Questions)

Employees' Compensation Act, 1923 – Definitions – Liability of the employer to pay compensation – Personal injury– Accident - Arising out of and in the course of employment – Doctrine of Notional Extension – Occupational disease – Notice and Claims –Determination and Distribution of Compensation – Commissioner – Powers and Functions.

Employees' State Insurance Act, 1948 – Definitions – ESI Corporation – Standing Committee – Medical Benefit Council – ESI Fund – Contributions – Benefits – Adjudication of Dispute and Claims – Penalties.

Employees' Provident Funds and Miscellaneous Provisions Act, 1952 – Definitions – Central and State Board of Trustees - Provident Fund Scheme – Family Pension Scheme – Deposit Linked Insurance Scheme – Contributions – Determination of Money due from Employees - Authorities under the Act – Powers and Functions – Offences and Penalties.

Maternity Benefit Act, 1961 –Definitions– Eligibility– Maternity Benefit and certain other benefits under the Act – Notice of Claim – Prohibition against Dismissal and Wage Deduction – Inspectors – powers and duties.

Payment of Gratuity Act, 1972 – Definitions – Payment of Gratuity – Eligibility – Amount of Gratuity – Forfeiture of gratuity - Determination of gratuity amount – Recovery of gratuity – Compulsory Insurance - Controlling authority – Offences and Penalties.

Factories Act, 1948 – Definitions – Registration – Provisions relating to Health, Safety and Welfare - Special provisions relating to hazardous processes – Working hours of Adults – Regulation of employment of women and children – Annual leave with wages – Penalties and Procedure.

Motor Transport Workers Act, 1961 – Definitions, Registration of motor transport undertakings – Inspectors – Certifying surgeons – Welfare and Health – Hours and Limitation of employment – Employment of young persons - Wages and leave – Penalties and Procedure.

UNIT VI: ADMINISTRATIVE LAW (20 Questions)

Introduction to Administrative Law–Role of State from Laissez-Faire to Welfare State– Definition, Nature and Scope of Administrative Law- Relationship Between Administrative Law and Constitutional Law – Rule of Law - Doctrine of Separation of Powers - System of checks and balances – Classification of Administrative Actions.

Delegated Legislation – Need for Delegated Legislation – Delegated Legislation in India – Pre and Post Constitutional Period – Constitutionality of Delegated Legislation – Essential Legislative Function – Permissible and impermissible limits of Delegated Legislation - Control over Delegated Legislation – Judicial, Procedural and Legislative Control.

Need for Administrative Adjudication - Reason for growth of Administrative Tribunals - Procedure and powers of Administrative Tribunal – Tribunal under Constitution – High Court's Superintendence over Tribunals – Administrative Tribunals under Administrative Tribunals Act, 1985.

Principles of Natural Justice – Concept - Rule against Bias - Audi Alteram Partem – Exceptions to the Rule of Natural Justice

Judicial Review and Liability of the State - Judicial Review of Administrative Action through Writs - Kinds of Writs - Grounds for issue of Writs - Administrative Discretion - Nature and need of Administrative discretion - Grounds and Extent of Judicial Review of Administrative discretion – Doctrine of proportionality – Privileges and Immunities of Government in Legal Proceedings – Privilege to withhold documents – Miscellaneous Privileges of the Government - Notice, Limitation, Enforcement of Court Order - Binding nature of Statutes over the States action – Promissory Estoppel - Doctrine of Legitimate Expectation – Right to Information – Liability of State in Torts and Contracts.

Maladministration and Alternative Remedies - Ombudsman in England - Ombudsman in India – Lokpal – Lokayukta in States - Central Vigilance Commission.

Public Undertakings - Rights, Duties and Liabilities of Public Corporations - Controls over Public Corporations, Government Control, Parliamentary Control, Judicial Control, Public Control – Role of Ombudsman in Public Undertaking.

UNIT VII: LAW OF CONTRACTS AND TRANSFER OF PROPERTY ACT (30 Questions)

Essentials of Contracts – Valid, Void, Voidable - Discharge of Contracts – Quasi Contracts Damages – Compensation – Indemnity – Guarantee – Bailment – Lien – Partnership Act and Limited Liability Partnership- Specific Relief Act.

Mortgage – Definition and Kinds – Rights and Liabilities of Mortgagor and Mortgagee – Doctrine of Equity of Redemption – Collateral Advantages – Doctrine of Marshalling, Contribution and Subrogation – Charge & Lease – Differences.

UNIT VIII: COMPANY LAW & BANKING LAW (30 Questions)

Companies Act, 2013 - Definition - Characteristic of a Company - Types of Companies - Formation of a Company – Memorandum of Association, Articles of Association – Registration of charges – Formation of CSR Committee – Management of the company – AGM – Ordinary resolution & Special resolutions - Appointment & Qualification of Directors - Meeting of the Board and its powers – Quorum of the Board - Appointment of independent Directors – Duties of Director – Key Managerial personnel and promoter - Powers of Shareholders - Norms for accepting deposits from the Public – adjudicatory powers of Official Liquidator – procedure for merger and amalgamation– procedure for merging foreign company with an Indian company - process of rehabilitation and liquidation of the companies in case of financial crisis - Winding-up– Winding-up by Tribunals – Voluntary Winding-up.

National Company Law Tribunal and Appellate Tribunal.

Banking Law – Banker and Customer – Rights and Duties of Banker – Law relating to Loans, Advances and Investments by Banks.

Negotiable Instruments Act, 1881 - Definition and Characteristics – Parties to Negotiable instruments – Discharge and dishonor of instruments – Liability – Cheques – Civil and Criminal Liability for dishonor of cheque under Sec.138 to Sec.142 of the Amended Negotiable Instruments Act.

State Financial Corporation's Act, 1951 (SFCs Act) - Important Definitions viz., Board, Development Bank, Financial Corporation, Industrial concern - Powers and Duties of the Board – Rights available to Financial corporation to enforce securities in case of default - Power to call for repayment before agreed period - Special provisions for enforcement of claims by Financial Corporation - Procedure of District Judge in respect of applications – Recovery of amounts due to the Financial Corporation as an arrear of land revenue.

The Securitisation and Reconstruction of Financial Assets & Enforcement of Security Interest [SARFAESI] Act, 2002 - Important Definitions – Brief overview of the SARFAESI Act – Applicability of the SARFAESI Act -Features of SARFAESI Act – Procedure of the SARFAESI Act – Methods for recovery under SARFAESI Act– Enforcing security interests,i.e.,seizing the assets pledged as collateral security for the loan – Significance of the SARFAESI Act – Shortcomings and lacunae in the SARFAESI Act – Central Registry - Recent amendments in SARFAESI Act.

Recovery of Debts and Bankruptcy Act, 1993 - The Debts Recovery Tribunals [DRTs] and Debts Recovery Appellate Tribunals [DRATs] - Jurisdiction, Powers and Authority of Tribunals – Procedure of Tribunals – Recovery of Debts determined by Tribunal – Insolvency and Bankruptcy Code, 2016.

UNIT IX: PROCEDURAL LAW (25 Questions)

Plaint, Written Statement – Suits in General – Admission – Execution – Reference, Review, Revision – Brief History about the Criminal Procedure Code, 1973 - Bharatiya Nagarik Suraksha Sanhita, 2023 – definition – Classes of Criminal Courts – Processes to compel appearance – Summons, warrant of arrest – Jurisdiction of Criminal Courts in Inquiries and Trials – Trial Procedure – Appeals, Reference in Criminal Cases – General provisions regarding execution – Levy of Fine – The Contempt of Courts Act, 1971.

UNIT X: OTHER LAWS (15 Questions)

Indian Penal Code, 1860 - Bharatiya Nyaya Sanhita, 2023 - General explanations – General exceptions – offences against person and property.

Indian Evidence Act, 1872 - Bharatiya Sakshya Adhiniyam, 2023 – Scope, object and applicability of Indian Evidence Act and Bharatiya Sakshya Adhiniyam, 2023 and exclusion – Relevance of facts and admissibility of facts – Facts which need not be proved – Judicial notice – Burden of Proof – Types of evidence – presumptions.

Family Law in India – Law of Marriage and Divorce: Hindu, Muslim & Christian Law and Recent Developments – Law of Adoption – Hindu Adoption with Special Reference to the Juristic Concept and Development of Case Laws – Changes brought by Hindu Adoption and Maintenance Act, 1956 – Hindu Minority and Guardianship Act– Maintenance – Contemporary Changes – Muslim Law of Legitimacy – Acknowledgement of Paternity.

Motor Vehicles Act, 1988 – State Transport undertakings – Accident Claims Tribunals – No Fault Liability – Offences, Penalties and Procedure, Insurance of Motor Vehicles against third party risks – Recent amendments.

Consumer Law – Consumer Protection Act and its developments- Consumer, Complaint, Complainant – Consumer Rights – Filing of Complaints – Consumer Redressal Forums – Jurisdiction, Powers and Functions – Recent Amendments.

16. Mining Engineering (Degree Standard)

Code: 347

UNIT I: GEOLOGY, MINE DEVELOPMENT, DRILLING AND BLASTING (30 Questions)

Geology: Earth structure & Composition, weathering, ground water, Geological time scale, types of rocks and their modes of occurrence, mineral resources, their distribution in different types of rocks of different ages, classification and properties of minerals, Geological structures like folds, faults, etc., their classification and their significance in the mineral exploration & mapping, ore reserve estimation including their shape. Different Ore forming processes, origin & modes of occurrence, classification of mineral deposits, fossil fuels like coal, petroleum etc., Mineral distribution in India. Various exploration and prospecting methods including geophysical prospecting, their fields of application & limitations. Introduction to aerial and photography, remote sensing & GIS for mapping and exploration.

Role of Mining Industry in National Economy, Role of Mining Engineers in Mining Industry, Challenges faced by Mining Industry, Indian and World Mineral Resources, Types of Drilling; exploratory & production drilling; core recovery, core logging & interpretation of bore hole data, machines for opencast and underground mines, selection & limitations, parameters influencing drilling. Directional drilling, mechanics of different types of drilling,. Exploratory & production drilling, types of drilling and Explosives and accessories, properties, classification; Selection; Storage, transport and handling and use of explosives, different types of initiation systems, mechanics of blasting, drilling & blast design for opencast and underground mines (including solid blasting), secondary blasting, misfires, vertical crater retreat blasting, adverse impacts of blasting and their control, instrumentation, testing of explosives, fragmentation studies, controlled blasting, alternatives to blasting. Different modes of entry into underground mines, their location and design. Different methods of shaft sinking including special methods-various activities, modern & mechanized techniques of shaft sinking, shaft raising, shaft boring, widening and deepening of operating shafts. Drivage of drifts and tunnels covering all associated activities including continuous and tunnel boring techniques.

UNIT II: MINE ENVIRONMENT (20 Questions)

Mine gasses – occurrence, properties, detection, physiological effects and permissible limits, Mine climate and control, Heat and humidity, Natural Ventilation, Distribution of air current in mines, Resistance of mine roadways, Mine fans and their characteristics, testing, use of multiple fans. Ventilation and illumination survey, Ventilation planning in mines. Mine illumination, methane drainage Flame safety lamps, ventilation devices, Types of ventilation, auxiliary ventilation including overlap ventilation.

Ventilation network analysis and numerical problems, Pollution due to mining - Noise, air, water and land pollution, Ground vibrations, monitoring and control, Pollution standards and remedial measures, Spontaneous heating, Mine fires, Explosions – causes, prevention and control, Firefighting, reopening of sealed-off areas, Inundation – causes, prevention and control, Design of water Dams, Mine rescue and recovery, investigation after an explosion, rescue organization of a mining company, Air conditioning and air cooling, Rescue and First aid in mines.

Concept of environment and ecology, Landscape planning and analysis, Biosphere, Hydrosphere, Atmosphere, Nutrient cycling, Effect of industrialization in atmosphere, Air quality sampling and modeling, Impact of pollution on human health. Reclamation of mined out land, Tailings management and subsidence, Environmental impact assessment, Environmental management plans, Environmental audit, Environmental clearance for mining projects, Environmental legislations, Safety and environmental protection.

UNIT III: MINING MACHINERY (5 Questions)

Different types of motive power used in mines, Rope haulages, Wire ropes, safety devices, different types of locomotives, safety devices, free steered vehicles; Hydraulic, pneumatic and gravity transport, Mine pumps, different types, characteristics and fields of application, design of pumping systems, Rope haulage, locomotives and pumping calculations. Distribution of electrical power in mines, Electrical layouts, Mine cables, Flame-proof and intrinsically safe apparatus, Mine communication, man riding systems, different types of pumps, their characteristics and fields of applications.

Winding systems, Friction and drum winders, Multi-rope winding, safety devices, Winding accessories – winding engines, headgear, head sheave, skips, suspension gear, shaft fittings etc., duty cycles and winding calculations. Surface and pit-bottom arrangements, Coal face machinery including longwall

equipment, Different types of conveyors and their construction, design and calculations, High angle conveying, Hydraulic & Pneumatic transport, Aerial ropeways, Design and construction of silos and bunkers, Stacking and blending, Condition monitoring of mining machinery.

UNIT IV: SURFACE MINING (30 Questions)

Suitability of surface mining and limitations, Cut-off grades, Pit limits, Stripping ratios, Design of pit slope, haul roads, benches box cuts, Opencast mine development - different methods, Earth moving machinery - shovels, draglines, continuous surface miners, bucket wheel excavators, dumpers, rippers, scrapers, rock breakers etc., Productivity and maintenance of Heavy Earth Moving Machinery. Types of slope failures, Slope stability analysis and stabilization including dumps, In-pit-crushing and conveying, Continuous surface mining. Placer mining and solution mining, conversion of underground mines to opencast mines and vice-versa. Truck dispatcher systems, Machine availability, productive and maintenance scheduling, output, manpower and calendar planning.

UNIT V: UNDERGROUND MINING (COAL & METAL) (5 Questions)

Coal Mining: Importance of coal as a source of energy, current status of coal mining world over, grading of coal, Choice of mining methods and classification, Bord and pillar method - design of panels, pillar extraction by caving and stowing, partial extraction, supports, Longwall method - advance and retreat, mechanized longwall, latest trends, Design of longwall workings, salvaging and relocation of equipment, punched longwall. Thin and Thick seam mining, problems, multi-slices and special methods like gallery blasting, sub-level caving, horizon mining, contiguous, hydraulic mining, underground coal gasification, shield mining of steep seams, shaft pillar extraction, introduction to coal-bed methane.

Metal Mining: Classification of mining methods, Metal mining layouts, Methods of development -shafts, raises, winzes, drifts, bins, tunnels etc., Stope preparation, Stopping methods – supported and unsupported, their selection - longwall, room and pillar, shrinkage, sub-level, cut and fill, block caving and combined, backfilling, etc., Techno- economic analysis of mining systems, Extraction of remnant pillars, shaft pillars, Mining at great depths.

UNIT VI: ROCK MECHANICS & GROUND CONTROL (10 Questions)

Stress analysis, Numerical problems, Application of rock mechanics in mining, Physico- mechanical properties of rocks and rock indices, elastic constants - laboratory and in situ testing, Rock mass classification, Post-failure behaviour of rocks, Dynamic wave velocities and elastic constants, Time dependent properties of rocks, Non-Destructive testing, Rheological modeling, Theories of failure of rocks, Rock mechanics and ground control instrumentation, in situ stress measurement.

Roof examination, Different types of mine supports including FER supports, powered supports, etc. Design and selection of mine supports, Systematic supports, different methods of stowing, underground and face arrangements, Design of underground workings and stress distribution for Bord and pillar, Longwall workings, etc., Design of pillars; subsidence, measurement, prediction, control, remedial measures; Rock burst and bumps causes, prediction and control, etc.

UNIT VII: MINE SURVEYING & MINERAL PROCESSING (20 Questions)

Principles of mine surveying, Underground surveying methods, methods of leveling, contouring, curve setting, traversing, Triangulation and Correlation, Errors and adjustments, Preparation of mine plans and sections, Numerical problems, Modern surveying techniques, Photogrammetry and remote sensing applications, EDM, Total station, GPS, GPR, GIS Astronomical survey, stope surveying, subsidence survey.

Scope and objectives of mineral processing, Choice of methods, Sequence of operations, Comminution, crushing and grinding - Theories, types of crushers and their fields of application, power consumption for crushing and grinding, Laboratory and industrial sizing, wet and dry screening, laws of particle settlement. Different concentration techniques, jigging, tabling, flotation, wet and dry screenings, magnetic separation, electro-static separation, optical sorter, Sampling and control, Coal beneficiation - Generalized plant design and flow charts for beneficiation of coal and other important ores.

UNIT VIII: MINE MANAGEMENT & COMPUTER APPLICATIONS IN MINING (30 Questions)

History and development of mine management, Principles of scientific management, Functions of management, Organization structure of a mine and a mining company, Time and work study, Industrial relations, Trade union and workers participation in management, Industrial psychology, Operations

research - linear programming, transportation and assignment problems, CPM and PERT. SWOT analysis, supply chain management.

Microprocessors - Operating systems, Structured and object oriented programming, Networking Database management systems, Programming for mine design problems, CAD in mining for opencast and underground mines, Management information systems, ore-body modeling, Digitization and scanning, Artificial intelligence, Expert systems, Neural networks and virtual reality applications in mining, mining software. Computer applications in mine planning, ventilation network analysis, pillar design, blast design (opencast and underground), pumping systems, mine planning, etc.

UNIT IX: MINE LEGISLATION, SAFETY & ECONOMICS (30 Questions)

General provisions of Mines and Mineral Regulation and Development Act, Mineral Concession Rules, Mines Act, Regulations and Rules, Bye-Laws and DGMS Technical Circulars, Mines Vocational Training Rules, Land Acquisition, Explosives Act, Indian Electricity Rules, Workmen's Compensation Act, Rescue Rules, Mine accidents, classification and occupational diseases, accident statistics, Accident inquiry reports and cost of accidents, Mine disaster management, Safety audit and conferences. Environmental protection and conservation acts and rules, Miners diseases. Risk identification and Management.

Role of mineral industry in national economy, National mineral resources National mineral policy, Conservation of minerals, Royalty and taxation, Ore reserve estimation and geo-statistical methods, Mine valuation, Classification of reserves, net present value (NPV), Depreciation, Pricing and sale of minerals, Marketing and inventory, Costing, Wages and incentives, Book keeping, Balance sheet and profit and loss accounts, Numerical problems, Capital and revenue expenditure, DCF, profitability analysis, Economics of various mining operations, Assessment of cost of various mining operations, cost control methods.

UNIT X: MINE PLANNING & DESIGN (20 Questions)

Ore-body modelling, Opencast mine planning - mine cuts, surface structures, division of mining areas into blocks, Open pit optimization, Mine scheduling, Underground (coal and metal) mine planning, Location of mine entries, Optimization of mining parameters, Planning of production capacities, production planning and scheduling, productivity indices, Techno-economic analysis, Quality control and conservation, Planning and selection of equipment, Manpower and output planning, Preparation of mining projects - feasibility and detailed project reports, Sources of funding, Government policies., Mine Closure, Quality control.

17. Personnel Management, Industrial Relations, Business Administration and Social Work (PG Degree Standard)

Code: 561

UNIT I: PERSONNEL MANAGEMENT (15 Questions)

Definition, Evolution and Growth - Functions of Personnel Management - Factors Influencing Personnel Policy - Qualities and Qualification of Personnel Manager- Organisation of Personnel Department - Challenges and Role of Personnel Manager – Progress of Personnel Department in India

UNIT II: HUMAN RESOURCES PLANNING AND DEVELOPMENT, RECRUITMENT, SELECTION, PLACEMENT AND TRAINING (25 Questions)

Need for HR Planning and its types – Factors affecting manpower planning – Role of Human Resources Department - Techniques and Job description – Recruitment Practices in India Sources - Methods and Technologies for Recruitment Methods of Selection – Principles and Problems in Induction – Need and importance of Training – Steps in Systematic Training – Evolution of Training Programme

UNIT III: PERFORMANCE APPRAISAL, MOTIVATION AND LEADERSHIP (15 Questions)

Objectives and Benefits of Performance Appraisal – Characteristics of effective appraisal system - Process and Methods of Performance Appraisal – Theories of motivation and techniques of motivation – Legal and ethical issues in motivation – Theories and characteristics of leadership – Types of leaders.

UNIT IV: LABOUR MANAGEMENT RELATIONS AND LABOUR LEGISLATIONS (30 Questions)

Concept of Labour Management – Labour administrative practices – administrative agencies – labour policy – Workers participation in management and settlement of Labour disputes - Unfair labour Practices – Code of wages – Industrial Relation Code –Social Security code – Occupational safety, Health and working conditions code - Grievance Redressal Mechanism – Labour Courts and its functions – Factors affecting labour relations

UNIT V: ORGANISATIONAL BEHAVIOUR (20 Questions)

Organisational Behaviour :Importance – Historical Development of Organisation Behaviour Understanding Individual :Personality- Perception-Learning-Values-Attitude- Job Involvement – Organisational Commitment – Job Satisfaction – Emotions – Emotional Intelligence – Spiritual Quotient. Understanding groups: Meaning of group and group dynamics – Theories of Group Dynamics – Group Cohesiveness – Team Building- Management of change-Organisational Culture-Management of Conflict-Organizational Citizenship Behaviour. Unit VI: Operations Management (20 Questions) Operations Management concept, objectives and types – Characteristics of Modern Operation Management – Differences between Services and Goods – Operation Strategy – Supply Chain Management – Warehousing and Supply Chain Strategies – Supply Chain Dynamics. Operations Planning- Work study: Objectives, Procedures – Method Study and Motion Study - Work Measurement and Productivity. Total Productive Maintenance- Materials management and Purchase Management - Project management - Quality Control – Quality Movement – Continuous Improvement – Tools – Total Quality Management (TQM) concepts – ISO Quality Certification – Quality Assurance.

UNIT VII: MANAGEMENT INFORMATION SYSTEM & E-COMMERCE (20 Questions)

Data, Information, Intelligence, Information Technology, Information System, Functional Information Systems, DSS, EIS, KMS, GIS, International Information System-Data Base Management System- Role of information management in ERP, e-governance, Data Mining, Business Intelligence, Pervasive Computing, Cloud computing, CMM. Electronic Commerce: Technical Components of E-Commerce Functions of E-Commerce - Advantages and disadvantages of E- Commerce -Electronic Commerce and Electronic Business - Electronic Commerce Technology - Building the E-Business application - Avoiding legal issues- Web strategy: Attracting and retaining visitors - Search Engines and Portals- Cyber service - Online Banking.

UNIT VIII: FUNDAMENTALS OF SOCIOLOGY AND PSYCHOLOGY (15 Questions)

Sociology: Definition, meaning and scope; basic sociological concepts: Society-meaning, definition and types, structure, features; social institutions; concept of social system and sub system, classification of social systems, culture: concept, characteristics, social stratification, social processes- social control, social change in India, social movements, crime and delinquency; social problems-poverty, inequality, casteism, causes and consequences.

Psychology: Definition, meaning and scope, lifespan, phases of human growth and development, (Erik Erikson and Freud) needs, tasks and challenges, influence of hereditary and environment; psychological processes for understanding behaviour, intelligence, sensation, emotions, learning, memory, attitudes, behaviour, perceptions and prejudices; life events and their impact on behaviour.

UNIT IX: HEALTH CARE PRACTICE (10 Questions)

Health: Definition and concept; Rehabilitation, definition, types and principles – UN convention on the rights of persons with disabilities; policies and programmes; Community –Based Rehabilitation. Hygiene: Personal, food and Environmental hygiene; Relationship between health and hygiene; Environmental pollution; Living conditions: housing, sanitation, waste disposal and their influence on Health.

Community health: Definition, health indicators, disease, sickness/illness, definition of public health, Communicable and non-communicable diseases: causes, prevention and treatment, Primary Health Care; Health Education;

Concept of mental health: Magnitude of mental health problems, mental health and Well Being; definition.

Health Programmes & Global Health Promoting Agencies: National Mental Health Programme, National Tuberculosis Programme (NTP), National AIDS Control Programme (NACP), National Malaria Control Programme (NMCP), Universal Immunization programme (UIP), National Cancer Control

Programme (NCCP), National Health Mission (NHM), Reproductive and Child Health Programme, National Family Welfare Programme. WHO, UNICEF, FAO, UNFPA, ILO.

UNIT X: INDUSTRIAL RELATIONS AND LABOUR WELFARE (30 Questions)

Industrial Relations: Concept, characteristics, Industrial Relations at plant and shop floor level, Industrial conflicts: concepts of industrial peace; cause and consequence of industrial conflict, strikes and lock-outs; conflict resolution, mediation, conciliation: arbitration and adjudication; statutory and non-statutory machinery for prevention and settlement of disputes. Trade Unions: Trade unionism in India, role in Industrial relations.

Occupational Hazards and Safety: Meaning. Occupational Hazards, Industrial Health and Industrial Safety. Industrial Accidents-causes and prevention. Meaning of Safety and Need for safety in Industries. Job stress. Problems of Job stress with special reference to new generation industries.

Statutory Provisions In India: Statutory Provisions in India connected with health, safety and welfare of workers. Introduction to The Factories Act, 1948- Statutory Provisions relating to Labour Welfare, Industrial Health and Industrial Safety in Factories. Role of H.R. Managers in Labour Welfare.

Labour Welfare: Concept, definition, philosophies, need, objectives, principles, scope and limitations of labour welfare; Historical development of labour welfare in India. Statutory and Non-Statutory Welfare Provisions: Industrial Counseling- Pre-retirement, Quality of work life. Social security, social security measures; Standardization, Wage policy, Wage incentives, bonus and profit sharing. Collective Bargaining: Meaning, goal, phases, pre-requisites, principles, strategies and negotiation skills, factors influencing collective bargaining, Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013.

HR System Concept and functions: HRM, HRD & HR; evolution, Asian trends; HRD system and sub-systems; elements, goals, importance of HRD in Industry; 360 Degree feedback; leadership and leadership development; mentors & modeling; Organizational commitment CSR in HR.

18. Psychology (PG Degree Standard)

Code : 372

UNIT I: DEVELOPMENTAL PSYCHOLOGY (20 Questions)

Prenatal, Infancy, Childhood – Characteristics, Periods, Hazards, Developmental Tasks. Physical, Cognitive, Social, Emotional, Moral Development.

Adolescences - Characteristics, Hazards, Developmental Tasks, Physical, Cognitive, Social, Emotional, Moral Development

Adulthood - Characteristics, Developmental Tasks, Vocational & Marital Adjustment, Hazards, Physical, Emotional and Social Changes.

Middle age - Characteristics, Developmental Tasks, Vocational & Marital Adjustment, Hazards, Physical, Emotional and Social Changes.

Old age - Characteristics, Developmental Tasks, Hazards, Physical, Emotional and Social Changes, Graceful Aging and Death and Adjustments.

UNIT II: PERSONALITY: THEORIES AND APPLICATIONS (20 Questions)

Personality - Definition, Levels of Personality Analysis, Sources of Personality Data, Role of Personality Theory, Personality Assessments

Approaches - Psychodynamic, Dispositional, Biological, Intra-psychic, Cognitive, Experiential, Social and Cultural. Eastern Perspective – Yoga and Hindu Tradition, Zen Buddhism, Sufism and Islamic Tradition. Applications of Various approaches of Personality.

UNIT III: BIO PSYCHOLOGY (10 Questions)

Introduction to Neuron and Nervous System – Brain and its functions – Endocrine Glands – Characteristics, Major Endocrine glands, Hormone Characteristics and Functions. State of Consciousness. Physiology of Motivation and Emotions. Research Methods in Bio Psychology.

UNIT IV: COGNITIVE PSYCHOLOGY (20 Questions)

Cognitive Psychology - Nature, History, Cognitive Neuro Science and Applications – Perception - Definition, Nature & Theories. Attention – Processing Capacity in Selective Attention, Models of Selective attention. Pattern Recognition and Consciousness. Memory Structure and Processes – Types and Process of Memory, Theories of neurocognition. Mental Representation – Models, Mental Imagery - and Cognitive Psychology, Cognitive maps, Storing and Retrieval, Theories of retrieval, Forgetting, Cognitive Development - Life Span Development and Theories.

UNIT V: ADVANCED SOCIAL PSYCHOLOGY (20 Questions)

Social Psychology – Definition, Perspectives, Social Perception, Social Cognition, Attitudes, Social Identity, Prejudice - Causes and Effects. Interpersonal Attraction - Close relationships, Social Influence, Pro Social Behaviour, Aggression – Nature, cause and control, Groups and Individual behaviour. Social Psychology in Action.

UNIT VI: HEALTH PSYCHOLOGY (20 Questions)

Health Psychology – Definition & Scope. Historical Perspective on health & healing. Factors influencing Health. General approaches to health – Models and theories of health, Psychological approaches to health. Health enhancing behaviour - Eating behaviour & health, Maintaining healthy weight, Healthy relationships – Sexuality, Intimacy, Communication, Anger.

Health compromising behaviour- Smoking –Tobacco and its biological & psychological effects, Tobacco related damage to health, quitting smoking and related therapies.

Alcohol – biological and social effect, Use and abuse, Interventions for alcoholism. Stress and Coping – Types of stressors, Theories of stress, types of coping, stress management techniques. Cardiovascular Disease , Psychoneuroimmunology.

UNIT VII: PSYCHOPATHOLOGY (30 Questions)

Mental disorders – Models, Diagnostic classification system. Theoretical approaches of Psychopathology. Assessment – Clinical interviews, MSE, MMSE, Case history, Clinical observations. Tests- Intelligence, Neuropsychological testing, Developmental and Educational testing – Organic disorders – Disorders of childhood and adolescence, Anxiety, Trauma, Stress related and Somatoform disorders, Disorders of adult personality, gender and behaviour -Impulse control disorder, Substance use and addictive disorder, Sexual dysfunctions, Mood- Disorder, Schizophrenia and other psychotic disorder. Ethics in clinical practice.

UNIT VIII: ORGANIZATIONAL BEHAVIOUR AND HUMAN RESOURCE MANAGEMENT (10 Questions)

Organizational Behaviour- Definition, Nature & scope, Approaches. Perception, Attitude, Learning, Attribution, Motivation – Definition, theories and applications in organizations. Communication, Leadership and theories, Change process. Group and Teams, Conflict process, Power and politics.

Human Resource Management – Definition, Nature and Scope, Human Resource Planning, Job Analysis, Recruitment, Selection and Placement Compensation, Performance and Management, Training and Development, Grievance, Discipline and Risk Management, Recent Trends in Human Resource Practices.

UNIT IX: COUNSELLING AND THERAPY (30 Questions)

Counselling – Origin, Scope and Structure – Steps in Counselling - Factors affecting counselling process, Skills for an effective counsellor –Factors of Counsellee – Early Theories of Counselling - Contemporary Theories of Counselling, Individual Counselling - Nature, Process and Benefits, Group Counselling – Nature, Scope and Limitations – School Counselling - Nature Role of Teacher, School Counsellor, Counselling and School Curriculum, Vocational Counselling - Theories, Process, Counselling in Specific areas – Family, Marriage, Women, Weaker Section, drug addicts, Delinquents – Review of Counselling - Counselling Evaluation, Monitoring, Evaluation - Approaches, Types, Techniques.

UNIT X: RESEARCH METHODOLOGY (20 Questions)

Research - Objectives, Types, Significance, Steps in research process, Ethics in Research.

Research problem – Review of literature, Measurement, Variables and Hypothesis, Sampling techniques – Non experimental Method – Observational Research, Interviewing, Focus groups, Survey, Case study.

Experimental Method – Single factor design, Factorial Design, Standardization of psychological test. Parametric and Non-Parametric statistics. Qualitative Research Methods and analysis. Reporting research in Psychology.

19. Sociology (PG Degree Standard)

Code: 344

UNIT I: NATURE AND SCOPE OF SOCIOLOGY (20 Questions)

Meanings, Nature, Scope and Relevance of Sociology. Sociology and other Social Sciences: Anthropology, Psychology, Economics and History.

UNIT II: THEORETICAL PERSPECTIVES (20 Questions)

August Comte - Law of Three Stages, Social Statics and Dynamics, Herbert Spencer - Organic Analogy and Theory of Evolution, Emile Durkheim – Social Fact, Mechanical and Organic Solidarity, Suicide. Karl Marx - Economic Determinism, Class Struggle, Alienation, Pareto - System in Equilibrium, Logical and Non Logical Action, Circulation of Elites, Simmel – Theory of Social Conflict, Parsons –Human Action and Pattern Variables. Max Weber: Protestant Ethics, Authority and Bureaucracy.

UNIT III: SOCIALIZATION AND SOCIAL GROUPS (20 Questions)

Processes of Socialization, Associative and Dissociative Process, Agencies of Socializations: Family, Religion, Education and Media. Social Groups: Primary and Secondary Groups. In and Out Groups.

UNIT IV: SOCIAL STRATIFICATION AND SOCIAL CONTROL (20 Questions)

Nature and Types of Social Stratification, Forms of Social Stratification: Caste and Class. Social Mobility: Factors facilitating and hindering Social Mobility. Major Tribes in India, Socio–Economic and Cultural Aspects. Education, Development and Modernization.

UNIT V: RURAL AND TRIBAL SOCIETY (20 Questions)

Socio–Cultural dimensions of rural community, Rural social Problems: Poverty, indebtedness, illiteracy and unemployment. Rural Development Programmes: Distribution of Tribal Population – Problems of Tribes and Welfare and Constitutional Safeguards.

UNIT VI: URBAN SOCIETY (20 Questions)

Socio–Cultural dimensions of Urban Society, Urbanization–Problems of Urbanization – Slums, housing, transportation and health. Urban crimes and Juvenile delinquency, Alcoholism and Drug–Addiction. Strategies and Programmes of Urban Planning and Development.

UNIT VII: SOCIAL CHANGE (20 Questions)

Theories of Social Change-Evolutionary, Conflict and Cyclical, Factors and Processes of Social Change: Westernization, Modernization and Globalization, Legislative and Executive Measures in Social Change, Role of Non-Government Organizations in Social Change.

UNIT VIII: SOCIAL MOVEMENTS (20 Questions)

Characteristics and Types of Social Movement, Social Movements in India Dravidian Movement, Backward Class Movement, Dalit Movement, Jharkhand Movement, Trade Union Movement, Women's Movement and Environment Movement. Social–Political Back ground of National Movement in India.

UNIT IX: SOCIAL DEMOGRAPHY (20 Questions)

Meanings Scope and Importance. Demographic Transition, Demographic Variables, Fertility, Mortality and Migration, Population Size, Growth, Composition and Distribution of population in India, India's National Population Policy.

UNIT X: SOCIAL PROBLEMS (20 Questions)

Meanings and Characteristics. Crimes Beggary. Child Labour, Child Abuse Street Children, Unemployment and under employment, Gender Injustice, Communal Violence and Corruption.

UNIT I: PROBABILITY AND RANDOM VARIABLES (20 Questions)

Introduction to probability: Random experiments, sample space and events, definition of probability - classical, empirical and axiomatic approaches to probability; addition and multiplication theorem, conditional probability and Bayes' theorem. Random variables and distribution function, distribution function of a random vector – Mathematical expectation and conditional expectation - Markov inequality - Chebyshev's inequality - Convergence in probability – Convergence in distributions - Weak and strong laws of large numbers – Central limit theorems (Lindeberg-Levy, Liapunov's and Lindeberg-Feller).

UNIT II: DISTRIBUTION THEORY (20 Questions)

Introduction to distributions: Marginal and conditional distributions Generating functions: MGF, PGF and CGF – Characteristic functions.

Discrete distributions: Binomial, Poisson, Negative binomial, Uniform and Hyper geometric distribution. Continuous distributions: Uniform, Normal, Cauchy, Beta, Gamma, Exponential, Weibull, Pareto and Log-Normal. Sampling distributions: t, F and Chi-square distributions and their properties.

UNIT III: ESTIMATION THEORY (20 Questions)

Introduction to estimation theory: Consistency, unbiasedness, sufficiency, efficiency and completeness. Theorems and Inequalities: Cramer-Rao inequality, Chapman-Robbins inequality, Rao-Blackwell, Lehman-Scheffe, Neyman-Fisher factorization theorems with examples.

Methods of Estimation: Methods of moments, maximum likelihood, minimum chi-square and least squares, Bayesian estimation (with examples) – Confidence intervals for large and small samples.

UNIT IV: TESTING OF HYPOTHESIS AND NON-PARAMETRIC TESTS (20 Questions)

Introduction to Testing of Hypothesis: Null and alternative hypotheses, simple and composite hypotheses, two types of errors – Critical region – Size and level of a test - Power function.

Tests: Most powerful test, Neyman-Pearson lemma: UMP and unbiased tests - MLR property and its uses for construction of UMP test.

Non-Parametric tests: Run test, Median test, Sign test, Mann-Whitney test, Wilcoxon test, Kolmogorov-Smirnov test (one and two sample test procedures), Kruskal-Wallis test and SPRT Test.

UNIT V: REGRESSION ANALYSIS (20 Questions)

Simple and Multiple regression models: Description of data model – Estimation and testing of hypothesis on regression coefficients – Adequacy measures – Predicted values and standard error – Evaluation of fit – Analysis of residuals.

Multicollinearity and its effects on inference and forecasting – Selection of variables – Forward selection and backward elimination procedures (step-wise method).

Introduction to Generalized Linear Models: Components of GLM - Logistic regression model - Fitting and interpretation.

UNIT VI: SAMPLING THEORY (20 Questions)

Introduction to the theory of Sampling: Sampling designs – estimation procedures – properties of estimators – SRSWR and SRSWOR and their properties.

Systematic and Stratified Sampling methods, Ratio and Regression estimators, estimation under double sampling – Sampling and non-sampling errors – Cluster sampling – Two stage and Multistage sampling – Randomized response techniques - Sample survey organizations – CSO and NSO.

UNIT VII: DESIGN OF EXPERIMENTS (20 Questions)

Contrasts: Linear and orthogonal contrasts – Linear models: Fixed, random and mixed effect models. Principles of experimental designs – Construction and analysis of CRD, RBD, LSD, 2^n and 3^n factorial experiments - Partial and complete confounding – BIBD – PBIBD - Split plot design - Youden Square design – Lattice design.

UNIT VIII: STATISTICAL QUALITY CONTROL (SQC) (20 Questions)

Introduction to statistical process and product control: Control charts – Shewhart control charts for variables and attributes: \bar{X} , R, S, p, np, c and u charts – CUSUM charts – OC curve for control charts.

Acceptance sampling: Sampling inspection – AOQL, LTPD, producers' and consumers' risks - Single, double, multiple and sequential sampling plans for attributes and variables – OC, ASN, ATI and AOQ curves. Implementing six sigma – over view and implementations.

UNIT IX: TIME SERIES AND INDEX NUMBERS (20 Questions)

Concepts of time series, additive and multiplicative models, decomposition into components, determination of trend by free hand method, moving averages, fitting of mathematical curves, seasonal indices and the estimate of the variance for random components, autoregressive, moving averages and ARIMA models.

Definition, construction, interpretation and limitations of index numbers - Laspeyre's, Paasche's, Marshall–Edgeworth, Drobish-Bowley, Fisher's index numbers and their comparisons for ideal index number - Construction for cost of living index and wholesale price index.

UNIT X: MACHINE LEARNING TECHNIQUES THROUGH R AND PYTHON LANGUAGES (20 Questions)

Overview of R Language – Defining the R project – Objects and data structures – Graphics using R language – Calculation of measures of central tendency, dispersion, correlation and fitting of regression lines (Linear and logistic).

Overview of Python Language – Regular expressions – Scientific libraries: Numpy, Scipy, Matplotlib and Pandas.

Machine Learning: Supervised learning – Classification (KNN and Naive Bayes) and Regression (Linear and Logistic) techniques – Unsupervised learning (Clustering methods).

21. Statistics and Economics (PG Degree Standard)

Code: 564

UNIT I: PROBABILITY, RANDOM VARIABLES AND DISTRIBUTION THEORY (25 Questions)

Introductory concepts of Probability, Definition, Axioms, Basic Theorems and Baye's Theorem. Random Variables – Mathematical Expectation and Conditional Expectation. Chebechev's inequality – Convergence in Probability – Weak and Strong laws of large numbers – CLT (Lindberg-Levy and Lyapunov's). Marginal and Conditional distributions, MGF, PGF and CGF. Univariate Distributions: Negative Binomial, Hyper geometric, Geometric, Cauchy, Beta, Gamma, Weibull, Log-Normal. t, F and Chi-square distributions. Bivariate Binomial, Bivariate Poisson, Multinomial, Bivariate Normal distributions.

UNIT II: ESTIMATION THEORY, TESTING OF HYPOTHESIS AND NON-PARAMETRIC TESTS (20 Questions)

Properties of Estimators, Cramer – Rao inequality, Rao-Blackwell, Lehman-Scheffe and Factorization theorems and applications. Methods of Estimation – MLE, Moments and Least squares. Confidence intervals for mean and variance in large and small samples. Elements of Testing of Hypothesis – Definitions, Types of errors – Critical region, size and level of a test – Power function. Most powerful test, NP Lemma, UMP and Unbiased tests. MLR property and simple applications. Non-Parametric Tests: Run, median, Sign, Mann-Whitney, Wilcoxon, K-S (one and two samples) and Kruskal-wallis tests

UNIT III: SAMPLING THEORY, DESIGN OF EXPERIMENTS AND INDEX NUMBERS AND TIME SERIES (25 Questions)

Sampling Designs: SRSWR, SRSWOR, Stratified, Systematic, Cluster and Multistage sampling methods – Estimation procedures and properties of estimators. Ratio and Regression estimators (under SRSWOR and Stratified], CSO and NSO. Linear models - Fixed, Random and Mixed effect models. Construction and analysis of 2^n and 3^n Factorial experiments including partial and complete confounding. Incomplete block designs – BIBD, PBIBD. Split plot design and Youden square design. Index Numbers: Introduction

– Construction of simple and weighted index numbers, Tests of Ideal index number, Cost of living and Whole Sale Price Index numbers. Time series: Introduction, Models and their components. Determination of trend by the method of moving averages and fitting of linear, quadratic and exponential curves. Determination of Seasonal indices by Ratio to Trend and Ratio to moving averages. Estimation of variance for random components by Autoregressive (AR) and Moving Averages (MA) and ARIMA models.

UNIT IV: CORRELATION, REGRESSION AND MACHINES LEARNING TECHNIQUES USING PYTHON (15 Questions)

Correlation Analysis – Simple, Partial and Multiple correlations. Regression Analysis – Simple and Multiple Linear regression models, description, estimation and Testing of hypothesis of regression coefficients. Model Adequacy measures – Multicollinearity Analysis and selection of variables by step-wise method. Generalized linear models – Introduction, Components of GLM, Logistic regression – Fitting and interpretation. Introduction to Python – Character set, Data types, Operators expressions, Control and Loop statements, Arrays, Lists, Dictionaries. Libraries - numpy, scipy, matplotlib and Pandas. Machine Learning Techniques - Supervised learning – Classification using KNN, and Regression (Linear and Logistic) techniques. Unsupervised learning - Linkage methods, k-means and k-Medoids methods.

UNIT V: MULTIVARIATE STATISTICAL ANALYSIS (15 Questions)

Normal distribution, Inference concerning single mean vector and two mean vectors using Hotelling's T₂ Statistic – Mahalanobis D² statistic and its distribution - Relation between T₂ and D² statistic. Principal Component Analysis and its uses - Factor Analysis and its applications – Classification problems – Fisher method for two populations, linear discriminant function and its applications

UNIT VI: MICRO ECONOMICS (20 Questions)

Theory of Consumer Behaviour – Indifference curve analysis – Revealed Preference theory – Choices under uncertainty – Neumann – Morgenstern hypothesis – utility functions under uncertainty Asymmetric information – Adverse selection and moral hazards – Asymmetric information in the Labour market – Market structure – oligopoly Market – cartel and Price leadership – Theory of distribution in imperfect product and factor market. Unit VII: Macro Economics (20 Questions) General equilibrium – IS-LM – BP model for an open economy – Welfare criteria – Arrow's impossibility theorem – Second Best solution – Calculation of National income, GNP, GNP Green GDP, Mundell – Fleming model – Effect of monetary and Fiscal Policies – Business cycle- Real Business cycle theory and New Keynesian approach

UNIT VIII: GROWTH AND DEVELOPMENT (15 Questions)

Steady state growth – Harrod – Domar model, Balanced and unbalanced growth theories – Rostow's growth model – New Growth theory – Theories of dualism – Regional, national and international dualism models – Composition and Direction of foreign trade – BOP disequilibrium – Methods to correct disequilibrium – New International Economic order – Functions of IMF, IBRD and ADB.

UNIT IX: STABILISATION POLICIES (15 Questions)

Monetary Policy instruments – Creation of Money and Creation of credit – Role of Banks and NBFIs – Money multiplier – Fiscal Policy instruments – Taxes – Government expenditure – Government debts – Deficits – Budget – FRBM – Fiscal federalism – Fiscal multiplier

UNIT X: INDIAN ECONOMY (30 Questions)

Leading issues in India and in Tamil Nadu – Human Development Index – Program in Human Development in India – Multi Dimensional Poverty – Poverty and Growth – Reforms on Poverty – India's demographic transition – Population policy in India – Unemployment and employment perspective Characteristics of Indian Labour Market – Employment policy in India – Migrant labourers – Agriculture prospects and problems – Trends in Agricultural productivity – Land reforms and effects – Second Green Revolution – Industrialisation in India – Performance of MSMEs – Large Scale industries in India – New Industrial Policy of 1991 – New Direction of policy on Public Sector- Planning Objectives and achievements at national and State level – Development strategy in India – Failures of Five Year Plans in India – NITI AAYOG – Liberalisation and Privatisation – Globalisation in India – 3 MNC's – Global Financial Crisis and its impact on Indian Economy – Environmental degradation and sustainable development – Issues and Challenges.

22. Statistics, Mathematics and Economics (Degree Standard)

Code: 504

UNIT I: ALGEBRA AND DIFFERENTIAL CALCULUS (20 Questions)

Theory of Equations: Relations between roots and Coefficients – Complex roots – Irrational roots – Related roots – Transformations of equations – Reciprocal equations. Matrix Theory: Symmetric – Skew Symmetric – Hermitian – Skew Hermitian – Orthogonal and Unitary Matrices – Rank of a matrix – Consistency and solutions of Linear Equations – Cayley Hamilton Theorem – Eigen values and Eigen Vectors. Differential Calculus: nth derivative – Leibnitz's theorem and its applications – Partial differentiation – Maxima and Minima of functions of two independent variables.

UNIT II: INTEGRAL CALCULUS AND DIFFERENTIAL EQUATIONS (20 Questions)

Integral Calculus: Methods of integration – Properties of definite integrals – Reduction formulae – Double Integrals – triple integrals – Applications to area, surface and volume – simple problems. First order but of higher degree equations – solvable for p, solvable for x, solvable for y – simple problems. Second order differential equations with constant coefficients with particular integrals for x^m , $\cos mx$, $\sin mx$, $e^{ax \cos mx}$, $e^{ax \sin mx}$ – simple problems. Partial Differential equations: Formation of Partial Differential equations by eliminating arbitrary constants and arbitrary functions – First order P.D.E. – complete integral – Singular integral – general integral – standard types $f(p, q) = 0$, $f(z, p, q) = 0$, $f(x, y, p, q) = 0$, Clairaut's form and Lagrange's equations – simple problems.

UNIT III: VECTOR CALCULUS AND OPERATIONS RESEARCH (25 Questions)

Vector Differentiation: Gradient, divergence, curl, directional derivative, unit normal to a surface. Vector Integration: line, surface and volume integrals – Applications of Gauss, Stokes and Green's Theorems – simple problems. Linear programming: Formulation – graphical solution – simplex method – Big-M method – Transportation problem – Assignment problem. PERT and CPM: project network diagram – Critical path – PERT computations. Inventory models: Basic concepts – EOQ models (i) Uniform demand rate infinite production rate with no shortages models (ii) Uniform demand rate with finite production rate with no shortages models.

UNIT IV: DESCRIPTIVE STATISTICS AND FITTING OF SIMPLE EQUATIONS (20 questions)

Introduction to Statistics, Uses, scope and limitations - Collection, Classification and Tabulation of data - Diagrammatic and Graphical representations of Data – Measures of location, dispersion, skewness and kurtosis – Bivariate data- Scatter diagram – Correlation, Partial correlation and regression – Fitting of Linear and quadratic equations by the method of least squares.

UNIT V: PROBABILITY AND STATISTICAL INFERENCE (25 questions)

Introduction to Probability - Addition, Multiplication and Baye's Theorems and simple applications. Random variables and Expectation– Univariate Probability distributions – Binomial, Poisson, Geometric, exponential and normal distributions (Mean & Variance). Sampling Techniques – Simple Random Sampling – Stratified and Cluster (Single Stage) - Estimation – Properties, Point Estimation by the method MLE. Tests of Hypothesis – Important terminology – Test procedures for large and small samples (z, t, Chi-square, F).

UNIT VI: TIME SERIES, INDEX NUMBERS AND STATISTICAL COMPUTING USING MS-EXCEL (20 Questions)

Time series – Components – Determination of Trend (Moving Average, Linear Trend by LSE) - Index Numbers – Construction of Simple, weighted Cost of living index numbers. Statistical Computing using MS-Excel: Introduction to MS-Excel – MS-Excel Options using Excel Shortcuts – Link the Data in Rows, Columns and Sheet - Functions: Logical Functions -Math and Statistical Functions – Regular Charts- Plotting Density Function and Distribution Function.

UNIT VII: MICRO ECONOMICS (15 Questions)

(a) Definition, Scope and Importance of Micro Economics – Law of Demand – Elasticity of Demand – Utility Analysis – Consumer Surplus.
(b) Production Function – Factors of Production – Producer's Surplus – Economies of scale – Cost and

Revenue curves in the Short-run and Long-run – Welfare Criteria – Adam Smith, Bentham, Marshall, Pigou and Kaldor.

UNIT VIII: MACRO ECONOMICS (15 Questions)

Definition, Nature and Scope of Macro Economics – Circular flow of Income in an Open Economy – National Income Accounting – Definition – Concepts: GNP, NNP, GDP, NDP, Personal Income, Per Disposable Income & Personal Savings, Per Capita Income – Keynesian Psychological Law of Consumption – Investment function – Marginal Efficiency of Capital – Multiplier – Accelerator. Inflation – Deflation – CPI – WPI – Phases of Trade cycle.

UNIT IX: STABILISATION POLICIES (20 Questions)

(a) Monetary Policy: Barter System – Demand for and supply of money – Functions of money, Functions of Central and Commercial Banks – Money Multiplier – Monetary Policy Instruments – SLR, CRR, OMO & LAF – Functions of Money Market – Capital Market.

(b) Fiscal Policy: Taxation – Types of Taxes – Canons of Taxation – Public Expenditure – Causes and Growth – Types of Public Expenditure – Public Debt – Internal and External Public Debt - Budget – Deficit and deficit financing – FRBM (Fiscal Regulation and Budgetary Management) – Fiscal Federalism.

UNIT X: INDIAN ECONOMY: (20 Questions)

(a) Agriculture: Contribution of the Agriculture sector to National Income and Employment – Agriculture Price Policies – Agriculture Statistics – Modern Technology in Agriculture Statistics – Agriculture Finance and Marketing.

(b) Industry: Contribution of the Industrial Sector to National Income and Employment – MSME and Large Scale Industries – Industrial Policy Resolutions – Industrial finance.

(c) Service Sector: Contribution of the Services Sector to National Income and Employment –Transport, Communication and IT Sectors.

(d) Economics of Planning: Five Year Plans – Planning Commission – Finance Commission – NITI Aayog – Government Welfare and Employment Generation Programmes.

(e) Population: Demographic transition and Demographic Statistics – Poverty Alleviation Programmes.

23. Statistics, Mathematics and Economics (PG Degree Standard)

Code: 563

UNIT I: PROBABILITY, RANDOM VARIABLES AND DISTRIBUTION THEORY (25 Questions)

Introductory concepts of Probability, Definition, Axioms, Basic Theorems and Baye's Theorem. Random Variables – Mathematical Expectation and Conditional Expectation. Chebechev's inequality – Convergence in Probability – Weak and Strong laws of large numbers – CLT (Lindberg-Levy and Lyapunov's). Marginal and Conditional distributions, MGF, PGF and CGF. Univariate Distributions: Negative Binomial, Hyper geometric, Geometric, Cauchy, Beta, Gamma, Weibull, Log-Normal. t, F and Chi-square distributions. Bivariate Binomial, Bivariate Poisson, Multinomial, Bivariate Normal distributions.

UNIT II: ESTIMATION THEORY, TESTING OF HYPOTHESIS AND NON-PARAMETRIC TESTS (15 Questions)

Properties of Estimators, Cramer – Rao inequality, Rao-Blackwell, Lehman-Scheffe and Factorization theorems and applications. Methods of Estimation – MLE, Moments and Least squares. Confidence intervals for mean and variance in large and small samples. Elements of Testing of Hypothesis – Definitions, Types of errors – Critical region, size and level of a test – Power function. Most powerful test, NP Lemma, UMP and Unbiased tests. MLR property and simple applications. Non-Parametric Tests: Run, median, Sign, Mann-Whitney, Wilcoxon, K-S (one and two samples) and Kruskal-wallis tests

UNIT III: SAMPLING THEORY, DESIGN OF EXPERIMENTS AND INDEX NUMBERS AND TIME SERIES (25 Questions)

Sampling Designs: SRSWR, SRSWOR, Stratified, Systematic, Cluster and Multistage sampling methods – Estimation procedures and properties of estimators. Ratio and Regression estimators (under SRSWOR

and Stratified], CSO and NSO. Linear models - Fixed, Random and Mixed effect models. Construction and analysis of 2^n and 3^n Factorial experiments including partial and complete confounding. Incomplete block designs – BIBD, PBIBD. Split plot design and Youden square design. Index Numbers: Introduction – Construction of simple and weighted index numbers, Tests of Ideal index number, Cost of living and Whole Sale Price Index numbers. Time series: Introduction, Models and their components. Determination of trend by the method of moving averages and fitting of linear, quadratic and exponential curves. Determination of Seasonal indices by Ratio- to- Trend and Ratio to moving averages. Estimation of variance for random components by Autoregressive (AR) and Moving Averages (MA) and ARIMA models.

UNIT IV: CORRELATION, REGRESSION AND MACHINES LEARNING TECHNIQUES USING PYTHON (15 Questions)

Correlation Analysis – Simple, Partial and Multiple correlations. Regression Analysis – Simple and Multiple Linear regression models, description, estimation and Testing of hypothesis of regression coefficients. Model Adequacy measures – Multicollinearity Analysis and selection of variables by stepwise method. Generalized linear models – Introduction, Components of GLM, Logistic regression – Fitting and interpretation. Introduction to Python – Character set, Data types, Operators expressions, Control and Loop statements, Arrays, Lists, Dictionaries. Libraries - numpy, scipy, matplotlib and Pandas. Machine Learning Techniques - Supervised learning – Classification using KNN, and Regression (Linear and Logistic) techniques. Unsupervised learning - Linkage methods, k-means and k-Medoids methods.

UNIT V: ALGEBRA AND REAL ANALYSIS (20 Questions)

Algebra: Groups – Sub groups – Normal sub-groups – Homomorphisms – Isomorphisms – Caley's theorem – Sylow's theorems - Finite abelian groups – Rings – Euclidean rings – Polynomial rings – Polynomial over the rational fields – Polynomials over the commutative rings – Division rings – Field – Finite fields – Wedderburn's theorem – Extension fields. Real Analysis: Limit – Continuity – Types of discontinuities – Functions of bounded variation – Riemann stielje's integral – Infinite series and infinite products – Sequences of functions – Fourier series and Fourier integrals.

UNIT VI: COMPLEX ANALYSIS AND FUNCTIONAL ANALYSIS (20 Questions)

Complex Analysis: Analytic functions – Properties – Singularities – Taylors and Laurents' series – Zeros and poles – Maximum principle – Harmonic Functions – Mean Value Property – Poisson's formula – Schwarz theorem – Power series expansion – Radius of convergence. Functional Analysis: Banach spaces – Definition and Examples – Holder's inequality and Minkowski's inequality – Continuous Linear transformations – The Hahn – Banach Theorem – Natural imbedding of x in to x^{**} - The open mapping theorem and the closed graph theorem – Properties of conjugate of an operator. Hilbert spaces – Orthonormal bases – Conjugate space H^* - Adjoint of an operator – Projection – Spectrum of an Operator – Spectral theorem for operators on Finite dimensional Hilbert space – Regular and singular elements in a Banach Algebra – Topological divisor of zero spectrum of an element – Formula for spectral radius – Radical and Semi simplicity.

UNIT VII: DIFFERENTIAL EQUATIONS AND OPERATIONS RESEARCH (20 Questions)

Differential Equations: Linear Differential equations of Higher order – Wronskian – Linear dependence and independence – Solutions in power series – Singularities of second order linear differential equations – Legendre's Equations – Legendre Polynomials – Bessel's equations – Bessel's functions – Generating functions – Rodrigue's formula – Partial Differential Equations of first order – Completer integrals – Singular integrals – General integrals – Charpitz method – Solutions of second order Linear partial Differential Equations. Operations Research: Linear Programming Problems (LPP) – Formulation – Graphical solutions – Standard form – Basic solutions – degenerate solution – Simplex method – Artificial variables BigM – Method and two phase method – Principle of duality – Dual simplex method – Revised simplex method. Transportation problems – Initial basic feasible solutions – Balanced and Unbalanced Transportation problems – Optimality Test – Degeneracy. Assignment – Problems – Hungarian method.

UNIT VIII: PRINCIPLES OF ECONOMICS (15 Questions)

a) Microeconomic Principles – Theory of consumer behavior – Utility – Indifference curve analysis Revealed Preference theory. Analysis of choices involving risk, uncertainty and asymmetric information – Neumann – Morgenstern hypothesis. Adverse selection and moral hazards, adverse selection in the

Labour market – Market structure.

b) Macroeconomic Principles – General equilibrium – IS – LM – BP model – Business cycle Theories.

UNIT IX: GROWTH AND DEVELOPMENT (15 Questions)

Monetary and Fiscal Policy instruments. Effects of Monetary and Fiscal Policies through Mundell – Fleming model. Foreign trade – BOP problems – Correcting methods. (NIEO) International Organizations and their functions. WTO, World Bank, IMF,

UNIT X: INDIAN ECONOMY (30 Questions)

Economic Development – Leading issues in India and in Tamil Nadu Human Development Index – Progress in HDI in India. Poverty – Reforms on Poverty. India's demographic transition – Population Policy in India. Characteristics of Indian labour market – Employment Policy in India – Issues and problems of migrant labourers. Agriculture prospects and problems – Land reforms and effects. Industrialization in India - Performance of MSMEs - Large scale industries in India – New Industrial Policy of 1991 – New Direction of Policy on Public Sector - Planning in India – Objectives and achievements at National and State level – Failures of Five Year Plans in India – NITI AAYOG – Liberalization, Privatization and Globalization in India - Environmental degradation and sustainable development – Issues and challenges.

24. Stenography in English (Diploma Standard)

Code: 378

UNIT I: (30 Questions)

1. Importance of Stenography
2. Consonants
3. Grammalogues
4. Phraseography
5. Circles and Loops
6. Initial and Final Hooks

UNIT II: (20 Questions)

1. Compound Consonants
2. The Halving Principle
3. The Doubling Principle
4. Medial Semicircle

UNIT III: (20 Questions)

1. Prefixes and Negative words
2. Suffixes and Terminations
3. Contractions
4. Special Contractions

UNIT IV: (20 Questions)

1. Advanced Phraseography
2. Intersections
3. Usage of Political Phrases
4. Usage of Legal Phrases

UNIT V: (10 Questions)

1. Note-taking and Transcription
2. Legislature Reporting
3. Techniques for improving Speed

அலகு I: (30 வினாக்கள்)

1. சுருக்கெழுத்தின் முக்கியத்துவம்
2. மெய்யெழுத்துக்கள்
3. தனிகுறிச் சொற்கள்
4. சொற்றொடரியல்
5. வட்டங்கள் மற்றும் சுழிகள்
6. ஆரம்ப மற்றும் இறுதி கொக்கிகள்

அலகு II: (20 வினாக்கள்)

1. கூட்டு மெய்கள்
2. பாதியாக்கும் முறை
3. இரட்டிப்பு முறை
4. நடு அரைவட்டம்

அலகு III: (20 வினாக்கள்)

1. முன்னொட்டுகள் மற்றும் எதிர்மறை சொற்கள்
2. பின்னொட்டுகள் மற்றும் இறுதி வார்த்தைகள்
3. சுருக்கங்கள்
4. சிறப்புச் சுருக்கங்கள்

அலகு IV: (20 வினாக்கள்)

1. மேம்பட்ட சொற்றொடரியல்
2. வெட்டும் முறை
3. அரசியல் சொற்றொடர்களின் பயன்பாடு
4. சட்ட சொற்றொடர்களின் பயன்பாடு

அலகு V: (10 வினாக்கள்)

1. குறிப்பெடுத்தல் மற்றும் விரிவாக்கம் செய்தல்
2. சட்டமன்றம் - குறிப்பெடுத்தல்
3. வேகத்தை மேம்படுத்துவதற்கான நுட்பங்கள்

26. மரபு கட்டடக்கலை மற்றும் சிற்பக்கலை
(Traditional Architecture and Sculpture)
(பட்டப்படிப்புத் தரம்)

குறியீடு: 511

அலகு I: கோயில் கட்டடக்கலை மற்றும் சிற்பக்கலை இலக்கணம் (30 வினாக்கள்)

ஆயாதி - பதவினியாசம் - மண்பரிசோ தனை - அஸ்திவாரம் - அளவைகள் - சாந்தார - நிரந்தார விமானங்கள் - சாந்திகம் முதலான விமான உயர்நிர்ணயம், பிரகாரலட்சணம், பரிவாரலட்சணம், மண்டபலட்சணம், கோபுரலட்சணம் - மரபுசார்ந்த கட்டடக்கலை நூல்கள் - சாதி சந்த விகல்ப ஆலயங்கள் - உபபீடம், அதிட்டானம், பாதம், பிரஸ்தரம், கண்டம், சிகரம், ஸ்தூபி, கும்பலதா, விருத்தஸ்புடிதம், கோஷ்டபஞ்சரம் - தோரணம் - கருவறை - அர்தமண்டபம் - முகமண்டபம் - சுற்றுபிராகாரமண்டபம் - வாகனமண்டபம் - துவஜஸ்தம்பம் - பலிபீடம் - தேர் - குளம், விமானம் மற்றும் கோபுரங்களின் உயர்நிர்ணய அளவீடுகள் (1 முதல் 13 தளங்கள் வரை) சிற்பத்துறை அளவைகள் - படிமவகைகள் - அறுவகைமானங்கள் - தாளமானங்கள் - தெய்வத்திருமேனி உயர்நிர்ணயம் - பங்க இலக்கணம் - ஆடை ஆபரணங்கள் - தலைக்கோலங்கள் - கைமுத்திரைகள் - ஆசனங்கள் - ஆயுதங்கள் மற்றும் லிங்கத்திருமேணிகள், 32 கணபதிகள் - 16 சுப்ரமணியர்கள் - 16 சிவமூர்த்தங்கள் - சப்தமாதர்கள் சக்திதிருமேணிகள் - சப்ததாண்டவம் - 63 நாயன்மார்கள் - அஷ்டதிக்கபாலகர்கள் தச அவதாரப் படிமங்கள் விஷ்ணுவின் நின்ற, அமர்ந்த மற்றும் கிடந்த திருக்கோலங்கள் - யோகம், போகம், வீரம் ஆபிசாரிக வகைகள் - 12 ஆழ்வார்கள் - கருட மற்றும் ஆஞ்சநேயர் இலட்சணம். உலோகப் படிமங்களின் முக்கியத்துவம் - உற்சவப்பேரம்பலிபேரம், ஸ்நபனபேரம், கௌதுகபேரம் - செப்புத்திருமேணிகளின் அளவு முறைகள் - கருக்கட்டுதல் - உலோககலவை முறைகள் - வார்ப்பு செய்தல் - உலோகப் படிமங்களை பாதுகாத்தல் மற்றும் பராமரித்தல்.

அலகு II: கட்டுமான பொறியியல் (20 வினாக்கள்)

கட்டுமானப் பொருட்களின் தரம் மற்றும் உறுதித்தன்மை (Strength of Materials), கட்டமைப்பின் இயக்கவியல் (Mechanics of Structure), அழுக்கம் மற்றும் இழுவிசை (Simple stress and strain), பொருண்மைத் தன்மைகளின் பொறியியல் தோற்றம் (geometrical properties of section), உத்திரங்கள் மற்றும் வளைவுகள் (Beams and bending), தூண்கள் மற்றும் கமாண்கள் (columns all Struts, Arches) - கட்டுமான வரைவு மற்றும் வரைபடம் (Structural Design Drawing), கட்டுமான பொறியியல் (Structural Engineering), இருபுற சுவர் மேல்வருகின்ற வலுவூக்கிய சிமெண்ட்கற்காரை உத்திரம் (Simply supported reinforced beam), ஒருவழிபலகை (one way slab), Shear and bend, இருவழி வலுவூக்கிய சிமெண்ட்கற்காரை உத்திரம் (Doubly Reinforced Beam), இருவழிபலகை (Two way slabs), டி-வடிவ உத்திரம் (T beam), தூண்கீழ் அடுக்கு (Column footing), கட்டமைப்புகளின் கோட்பாடு (Theory of structures), மேன்மைப்படுத்தப்பட்ட சிமெண்ட்கற்காரை (Advanced RCC), ஒருங்கிணைந்த இணைப்பு மற்றும் நேரடியான அழுக்குவிசை (Combined Bonding and Direct Stress), முன்அழுத்தப்பட்ட சிமெண்ட்கற்காரை (Prestressed concrete), மறுவடிவமைக்கப்பட்ட கம்பிகள் (Deformed bars), அளக்கையியல் (Quantity survey), மதிப்பீடு மற்றும் விலைவிவரம் (Estimate and costing).

அலகு III: இந்திய சமயங்கள் மற்றும் தத்துவம் (10 வினாக்கள்)

இந்திய சமயங்களின் தோற்றம், வளர்ச்சி மற்றும் கொள்கைகள் - சைவம், வைணவம், சாக்தம், காணாபத்தியம், கௌமாரம், செளரம், ஜைனம் மற்றும் பௌத்தம் - சமயக் கொள்கைகள் - கிராமதேவதைகள். இந்தியத்தத்துவம் - வேதம் - சமயக் கொள்கை, சடங்குகள் மற்றும் தத்துவ விளக்கம் - உபநிடதங்களின் மையக்கருத்து, பிரம்மம், ஆத்மா மற்றும் பிரபஞ்சவிளக்கம் - கடவுள்கொள்கை - நியாய, வைசேசிக பிரமாணங்கள், சாங்கிய, யோகம், பிரகிருதி - புருஷன் - பிரபஞ்சத்தின் தோற்றக்கொள்கை - வேதாந்தம் - அத்வைதம், துவைதம், விசிஷ்டாத்வைதம் - சைவசித்தாந்த கொள்கை விளக்கம்.

அலகு IV: இந்திய கோயில் கட்டடக்கலை மற்றும் சிற்பக்கலை வரலாறு (15 வினாக்கள்)

பண்டையகால சிற்பங்கள் மற்றும் கட்டடங்களின் தோற்றம் - சிந்து சமவெளி நாகரிக கட்டுமானங்கள் மற்றும் சிற்பங்கள் - முத்திரைகள் - சித்திர எழுத்துக்கள் - வேதகால கட்டடக்கலை - மௌரியகால பௌத்த கட்டடக்கலை மற்றும் சிற்பக்கலை - சுங்க, சாதவாகனர்கால கலைகள் - குப்தர்கால கட்டுமானக் கோயில்கள் மற்றும் சிற்பங்கள் - சாளுக்கியர்கால குடைவரைக்கோயில் மற்றும் கட்டுமானக்கோயில்கள் - இராஷ்டிரசூதகால கோயில் மற்றும் சிற்பங்கள் - கலிங்க கட்டடக்கலை மற்றும் சிற்பக்கலையின் தனித்துவம் - ஒய்சாளர் வரலாறும், அவர்களது கலை பங்களிப்பும்.

அலகு V: தமிழக கோயில் கட்டடக்கலை மற்றும் சிற்பக்கலை வரலாறு (20 வினாக்கள்)

சங்ககால கட்டடக்கலை, பல்லவர்காலம், முற்காலபாண்டியர், சோழர் - விஜயநகரர் - நாயக்கர், 19ம் நூற்றாண்டு கோயில்கள் சங்ககால கட்டடக்கலை - (சாளுவான்குப்பம்) - பல்லவர்கால குடவரைகள் - ஒற்றைகல்தளிகள், கட்டுமானகோயில்கள், முற்கால பாண்டியர்களின் குடைவரைகள், வெட்டுத்தளி, கட்டுத்தளிகள் - முத்தரையர், வேளிர், பழுவேட்டரையர், முற்காலசோழர் - சோழர்கள் - பிற்காலசோழர்கள் - பிற்கால பாண்டியர்கள் - மண்டபங்கள் - கோபுரங்கள் - விஜயநகரகாலம் - நாயக்கர்காலம். முக்கிய கோயில்களின் அடிப்படை அமைப்புகள் - மாமல்லபுரம் கடற்கரைக்கோயில், காஞ்சிகைலாசநாதர் கோயில், பனமலை தாளகிரீஸ்வரர் கோயில், நார்த்தாமலை விஜயாலயசோழீஸ்வரர், தஞ்சைபெரியகோயில், மதுரை மீனாட்சியம்மன் கோயில், திருவரங்கம், திருவண்ணாமலை, திருவில்லிபுத்தூர், தமிழர்களின் கட்டடக்கலையின் தனித்துவம் - நாகர, திராவிட, வேசரம் சார்ந்த கட்டடக்கலை ஒப்பீடு - பூம்புகார், சாலுவான்குப்பம் கட்டுமானங்கள்.

தமிழர்களின் தொன்மை வழிபாடு - கிராம தேவதைகளின் தோற்றம் - நடுகல்சிற்பங்கள் - மாரியம்மன் - இசக்கி அம்மன், ஐய்யனார், கருப்பசாமி, மாடசாமி, பேச்சி அம்மன், முனீஸ்வரன், பெரியாண்டவர் - நாகவழிபாடு - புற்றுவழிபாடு, சப்தகன்னிகள் வழிபாடு, அண்ணன்மார் வழிபாடு

அலகு VI: தொல்லியல் - கல்வெட்டியல் மற்றும் பராமரிப்பு முறைகள் (15 வினாக்கள்)

தொல்லியலின் உட்பிரிவுகள் - கல்வெட்டியல், நாணயவியல், மேற்பரப்புகள் ஆய்வு, அகழாய்வு, ஆழ்கடல் அகழாய்வு, அருங்காட்சியங்கள், கலைச்சின்னங்கள் பராமரிப்பு முறைகள் மற்றும் சட்டங்கள் யுனெஸ்கோ பாரம்பரிய சின்னங்கள் - நெறிமுறைகள் - கல்வெட்டுகளின் வகைகள், செப்பேடுகள் - எழுத்துக்களின் வகைகள், தமிழி, வட்டெழுத்து, தமிழ், கிரந்தம் - நாகரி - எழுத்துக்கள் மற்றும் அவற்றின் காலம் மற்றும் வளர்ச்சி - கல்வெட்டுக்களின் முக்கியத்துவம் - படியெடுக்கும் முறை மற்றும் பாதுகாப்பு - புணரமைப்பின் போது கல்வெட்டுகளை பாதுகாப்பதின் நோக்கம் மற்றும் முக்கியத்துவம்.

அலகு VII: கோயில் நிர்வாகமும் இந்துசமய அறநிலையத்துறை சட்டங்களும் (20 வினாக்கள்)

சமயம், சமூகம், பொருளாதாரம், கலை, கல்வி, மருத்துவம், நீதி, நிர்வாகம் இவற்றுக்கான மையமாக திகழும் கோயில்கள் குறித்து விளக்கம். முற்காலத்தில் கோயில் நிர்வாகத்தை மேற்கொண்ட ஊர், சபை, வணிகக்

குழுக்கள், சித்திரமேழி போன்ற நிர்வாக அமைப்புகள்

புநீருதரர், புநீமகேஸ்வரர், புநீவைஷ்ணவர், தேவகன்மி, கணக்கர் இவர்கள் மேற்கொண்ட கோயில் நிர்வாகம் தானம் மற்றும் இதர ஆதாரங்கள் மூலமாக பெறும் வருவாய்கள் தானம் மூலமாக பெறப்படும் நிலங்கள் மற்றும் விலைக்கு வாங்குதல் - உரிமை மாற்றம் நிலவிற்பனைகள் கோயில்கள் கருவூலம் - வட்டிக்கு பணம் வழங்குதல் போன்ற வங்கி செயல்பாடுகள், கோயில்களுக்கு தானமாக வழங்கப்பட்ட கால்நடைகளை பராமரித்தல் மற்றும் அதன் மூலமாக பெறப்படும் வருவாய்கள் - நெய், பால்பொருட்களை கோயில்நிர்வாகம் அபிஷேகம் மற்றும் தீபத்திற்காக பயன்படுத்துதல். குற்றச்செயல்களுக்கு தானமாக பெறப்படும் பொருட்களை நிர்வகித்தல் கோயில் பணியாளர்களின் பணிகள் மற்றும் அவர்களின் ஊதியத்தை நிர்ணயித்தல் பாளையக்காரர்கள் மற்றும் பாடிக்காவலர்களின் நிர்வாகமுறை ஆங்கிலேயர் காலத்தில் கோயில்நிர்வாகம் - பரம்பரை மற்றும் தேர்ந்தெடுக்கப்பட்ட கோயில் நிர்வாகபணிகள் - தேவஸ்தானம், தேவசம் நிர்வாகம் - கோயில் நிர்வாகச் சட்டங்கள் - இந்துசமய அறநிலைய சட்டங்கள் மற்றும் சிறப்பு சட்டங்கள் - திருப்பதி தேவஸ்தானம் போன்றவை. அரசு நிர்வகிக்கும் இந்துசமய அறநிலையத்துறை நிர்வாகம்.

அலகு VIII: கட்டுமானநிர்வாகம் (20 வினாக்கள்)

திட்டமிடுதலும் நிர்வகித்தலும்

கட்டுமான திட்டமிடல்

கட்டுமான ஒப்பந்தம்

ஒப்பந்தபுள்ளியும் ஒப்பந்த அறிவிக்கையும்

கட்டுமான செயலாக்கம்

பணிக்கான தொகையை வழங்குதல்

இருப்பு கிடங்கு

பணியாளர் மற்றும் தொழிற்சூட நிர்வாகம்

வங்கி கணக்குகளை பராமரித்தல்

அலகு IX: கோயில்பராமரிப்பு (25 வினாக்கள்)

வரையறை - நோக்கம் - நெறிமுறைகள் - தொன்மைத்தன்மை மாறாமல் அதன்அசல் தன்மையோடு பாதுகாத்தலின் நெறிமுறைகள் - சீரமைப்பும், புனர்தீர்மானம் ஆகியவற்றின் நோக்கமும் தேவையும் கல்கட்டுமானங்களில் ஏற்படும் சிதைவுகள், விரிசல்கள் ஆகியவற்றினை சரிசெய்தல் - இதற்கான நுட்பங்கள் கட்டுமானபொருட்களின் அடிப்படையில் பாதுகாத்தல், சீரமைத்தல் மற்றும் புனர்தீர்மானம் (கல் - செங்கல் - மரம் - உலோகம்) இயற்கை மற்றும் பேரிடர்களால் அஸ்திவாரங்களில் ஏற்படும் பாதிப்புகளை சரிசெய்தல் - ஈரப்பதத்தினால் சுவர்களில் ஏற்படும் பாதிப்புகளை சரிசெய்தல் - இந்துசமய அறநிலையத் துறையின் பாதுகாப்பு நெறிமுறைகள் உப்பு அரிப்பு மற்றும் கட்டடங்களில் வளரும் செடிகளை அகற்றும் முறைகள்

அலகு X: ஆகமங்கள் மற்றும் தமிழ்இலக்கியங்களில் கோயில் கட்டடக்கலை குறித்த குறிப்புகள் (25 வினாக்கள்)

சைவாகமம் - 28 சைவாகமங்கள் தோற்றமும் வளர்ச்சியும் - வேதம் மற்றும் ஆகமம் - உபநிடதம் மற்றும் ஆகமம் - ஆகமம் மற்றும் சமய ஆச்சாரியார்கள் - ஆகமத்தின் உட்பிரிவுகள் - ஆகமத்தின் முக்கியத்துவம் - ஆகமம் மற்றும் சைவசிந்தாந்த விளக்கம் - ஆகமங்கள் கோயில்களை திட்டமிடுதலும் நடைமுறைப்படுத்துதலும் - காமிகாமத்தில் கட்டடக்கலை குறிப்புகள் - வாதுளாகமம், ரௌரத்ர ஆகமங்களில் கட்டடக்கலை வைணவ ஆகமங்கள் வைகாணச மற்றும் பாஞ்சராத்ர ஆகமங்களில் கோயில் கட்டடக்கலை குறித்த குறிப்புகள் - வைணவ ஆகமங்கள் தோற்றமும் வளர்ச்சியும் - ஆகமத்தின் உட்பிரிவுகள் - ஆகமங்களின் முக்கியத்துவம் - விஷ்ணுவின் 10 அவதாரங்களின் விளக்கம் - வைணவத்தில் குடமுழுக்கு - வைணவ ஆகமங்களில் கோயில் கட்டடக்கலை - மர்ச்சிசம்ஹிதை - பாத்மசம்ஹிதை - அத்ரிசம்ஹிதை - பிரகத்சம்ஹிதை இவைகளில் கட்டடக்கலை மற்றும் சிற்பக்கலை விளக்கம் - சுப்ரபேதாகமம் - விமானார்ச்சனகல்பம் - குமாரதந்திரம் ஆகியவற்றில் கட்டடக்கலை.

தமிழ் இலக்கியங்களில் கட்டடக்கலை

கம்பராமாயணம் - நகரபடலம் (பாடல்எண். 7-13, 19, 23-30)

கலிங்கத்துபரணி - 4 கோயில் பாடியது (பாடல்எண். 1-11)

நெடுநல்வாடை (வரி 72-130)

மதுரைக்காஞ்சி (வரி 351-356)

பட்டினப்பாலை (வரி 142-145, 261-264, 285-287)

சிந்தாமணி - காந்தருவதத்தையார் இலம்பகம் (பாடல் 590-595)

தணிகைபுராணம் - அகத்தியர் அருள்பெறும் படலம் (பாடல் 64-79)

தேவாரத்தில் அப்பர் பாசுரங்கள்

பெரியபுராணம் - பூசலார்நாயனார்

பரிபாடல்

சிலப்பதிகாரம் - குன்றக்குரவை, வேட்டுவவரி, அரங்கேற்றக்காதை (அடியார்க்குநல்லார் உரை)

27. Town and Country Planning

[Single Paper consisting of the subjects Town Planning (PG Degree Standard), Civil Engineering (UG Degree Standard) & Architecture (UG Degree Standard)]

Code: 382

UNIT I: INTRODUCTION TO PLANNING – SCOPE AND CONTENT (10 Questions)

Planning System in India, Regional Plan, Master Plan, Structure Plan, Detailed Development Plans, City Corporate Plan and Smart City Plan. New Town concepts, case studies in India & U.K. – Concept of Region, Types of Region, Techniques of Regional Analysis, Growth Model, Regional disparities, Resources in Regional development. Multi-level Planning – Regional Planning in India, Regional Plan case Studies, USA, U.K., Japan.

UNIT II: PLANNING THEORY AND TECHNIQUES (10 Questions)

Process of evolution of human settlement planning - Principles in Planning – Rationality in Planning, Blueprint and Process mode, Disjointed Incremental mode of Planning, Normative versus Functional mode of Planning – Type of planning surveys, data identification for various plan preparation. Delphi, Trade off-game, Simulation models, Gravity analysis, Lowry model, Threshold analysis, Multivariate analysis – Optimization and economic analysis methods in project formulation and implementation, PBBS – URDPFI Guidelines.

UNIT III: URBAN SOCIOLOGY, ECONOMICS, GEOGRAPHY: THEORIES AND APPLICATIONS (10 Questions)

Socio-economic groups, structures and Institutions as related to urban and rural communities - Ecological processes and structures in Indian Cities - Social Change & Economic Development - Agglomeration economics- Economics of scale, Multiplier effect concept, scope, limitation - Basic and non-basic activities of economics base, methods of base identification - Land-use determinants, Locational Dynamics of urban Land-use - Spatial organization of Urban settlements - City-region, Urban Sprawl and Fringe - Urbanization in India and Tamil Nadu with reference to settlements and population distribution.

UNIT IV: ENVIRONMENTAL ISSUES RELATED TO PLANNING (10 Questions)

Components of Environment – Classification of Environmental Resources - Purpose and Objectives in Environmental Protection - Institutional and Legal Support in management of the Environment – Environmental Policies, and issues -Environmental Impact Assessment Practice in India - Types, Conceptual Approach and Phases of EIA – Impact Identification - Public Participation in the Process of Environmental Decision Making Process - Environmental Concepts – Sustainable Planning – Eco Cities, Compact Cities, Smart growth, Sponge city, IGBC Rating Systems applicable for Towns.

UNIT V: URBAN INFRASTRUCTURE NET WORK PLANNING ISSUES (10 Questions)

Obligatory and Discretionary Services, Implication of Urban Form and Size on Services, Norms and Standards, National Building Code, 2016. National and Local guidelines – Demand Strategy, Issues and Tasks, Operation and Management Aspects of each Service - Water Supply, Sewerage / Drainage, Solid Waste Management, Roads and Street Lighting - Priority, Placement Network Options, Effective System Analysis – Private and Public partnership and innovative concepts and practices in Infrastructure Development.

UNIT VI: PROJECT FORMULATION AND IMPLEMENTATION (15 Questions)

Types of Project, Project Cycle, Identification, Selection, Preparation - Capital Investment Programme, Internal Rate of Return, Net present Value - Cost- Benefit & Analysis, Social Cost Benefit analysis, Budgeting, Tamil Nadu Transparency in Tender Rules - Appraisal techniques – Project Proposal and objectives, Current base line conditions, Financial and Economical Appraisal, Socio cultural assessment - Process Monitoring – Key issues, Monitoring Schedule, Data collection, Design, strategy, Impact Evaluation – Approaches, Key issues, Alternative to large scale qualitative Evaluation designs.

UNIT VII: PLANNING LEGISLATION AND LEGAL FRAMEWORK (10 Questions)

The concept of law, Indian Constitution. Rights of Ownership and development of property. Statutory control as a positive tool in plan preparation and implementation - Evolution, scope and Significance of

Planning Legislation. History and survey of development of planning legislation in India - Panchayat Act, Municipality Act, Corporation Act, TNULB Act, Land Acquisition, Rehabilitation and Resettlement Act, 2013. Provisions in the above acts related to functions, powers, role and responsibilities of local bodies including elected representatives and officers - 73rd and 74th CAA and their implications on planning and development. Local Body finance, revenue, expenditure and resource mobilization - T & C Planning Act of Tamil Nadu 1971, The Ancient Monuments and Archaeological Sites and Remains Act, Tamil Nadu Combined Development and Building rules 2019, The Tamil Nadu street vendors scheme, The Tamil Nadu Real Estate (Regulation and Development) Act, 2016.

UNIT VIII: ISSUES IN TRAFFIC AND TRANSPORTATION PLANNING (10 Questions)

Highway classification - Traffic characteristics – Horizontal and Vertical alignment, Land use & Transportation relationships - Sight distance – Cross-sectional elements – at grade and Grade separated intersections - Volume Count – Origin and Destination – Parking and Public Transport - Surveys – Inventory of Transport facilities – Methods of Survey – Different modes – Capacities – Limitations – Planning Aspects - Coordination – Para Transit modes – Private transport – Urban Transportation Planning Process – Trip Generation – Trip Distribution – Modal Split – Trip Assignment, Congestion pricing, Non Motorized Transport, Transit Oriented Development, Bus Rapid Transit System, Unified Transport Authority.

UNIT IX: REMOTE SENSING AND G.I.S., IN PLANNING (15 Questions)

Basics of Remote Sensing and GIS. - Classification of spatial and non-spatial data application of spatial data in urban and regional planning - Identification of required spatial data layers - Coding schemes – digitization of spatial data – editing spatial data usable for the given planning problem – Land use Suitability Analysis, Land use Modeling, Existing Land use Preparation using Mobiles, Satellite Imageries, Aerial Photographs, Drones in Physical Planning.

UNIT X: CURRENT TRENDS AND ISSUES IN PLANNING (10 Questions)

Concepts of sustainable urban development, sustainable Transportation, E – Governance, HRIDAY, Rurban Mission, Swach Bharat Mission, AMRUT, National Health Mission, Public private partnership, local bodies and urban finance. Land Pooling concept, Transfer of Development Right, Accommodation Reservation, Formulation of Re-development and Urban Expansion Plans - Local Area Plans, Town Planning Schemes - Special Economic Zone, Value Capture Finance Policy Framework – Swiss Challenge Model, Industrial Corridor, Coastal Zone Management Plan.

Civil Engineering (UG Degree Standard)

UNIT I: BUILDING MATERIALS, CONSTRUCTION PRACTICES AND CONCRETE TECHNOLOGY (10 Questions)

Properties and Classification of cement, lime, bricks, stone and timber - Uses and Tests – materials for acoustics and insulation - construction details and supervision for masonry - Design of Brick Pier and Wall – Damp Proofing courses – Shoring, scaffolding and Underpinning – Ventilation and Fire resistant construction – Green Building Concept - Types of concrete – testing of fresh and hardened concrete – mix design – quality control – special concreting techniques - concreting equipment – centering and shuttering – slip and moving forms – construction joints.

UNIT II: ENGINEERING SURVEY, TOWN PLANNING, URBAN ENGINEERING AND CONSTRUCTION MANAGEMENT (10 Questions)

Survey – Basic principles - Classification - computation of areas and Volume – Levelling – Fly levelling – L.S and C.S – Contouring – Traversing – Heights and Distances - Tacheometry – Use of EDM and Total Station – Global Positioning System – Concepts and applications of Remote sensing.

Urbanisation- Trends in India- Planning process– stages, type of survey, collection of data- Development of new towns – urban modern and satellite towns - Smart cities - levels of planning.

Construction management – Construction planning and scheduling – preparation of different types of schedules – methods of scheduling – CPM – PERT – resource planning - Construction Contracts.

Types of estimates - Detailed estimates for different types of buildings - methods of valuation – depreciation – fixation of rent- rate analysis- Quantity estimation

UNIT III: STRENGTH OF MATERIALS, ANALYSIS OF STRUCTURES, DESIGN OF RC ELEMENTS, PRESTRESSED CONCRETE AND STEEL ELEMENTS (10 Questions)

Simple stress and strain - elastic constants- relationship - stress and strain in two dimensions, compound stresses- principal stresses- thin and thick cylinders - Bending moments and shear forces in statically determinate beams- simple bending theory - flexural shear stress - deflection of flexural members – torsion of circular section - Short and long columns. Analysis of statically determinate trusses and arches Working stress method (only for liquid retaining structures) - limit state design concepts - design of members subjected to flexure, shear, compression and torsion - Prestressed concrete: analysis and design of pre-tensioning and post tensioning beam.

Design of tension and compression members, beams and beam-columns, column bases - Design of bolted and welded connections.

UNIT IV: GEOTECHNICAL ENGINEERING AND PAVEMENT DESIGN (10 Questions)

Properties of soils - soil classification – Compaction - permeability and seepage – soil stresses- Compressibility and Consolidation - Shear strength – Laboratory and in - situ tests. Sub-surface investigation - scope, drilling bore holes, sampling, penetrometer tests, plate load test – stability of slopes - foundation types - foundation design requirements – shallow foundations – Types and Design of isolated and combined footings - bearing capacity - effect of shape, water table and other factors- stress distribution - settlement analysis in sands and clays – deep foundations - pile types, dynamic and static formulae - load capacity of piles in sands and clays.

Design and construction of bituminous and concrete roads - Drainage of roads - Maintenance of roads.

UNIT V: HYDRAULICS, WATER RESOURCES, WATER SUPPLY AND ENVIRONMENTAL ENGINEERING (10 Questions)

Hydrostatics - applications of Bernoulli equation, Laminar and turbulent flow in pipes, pipe networks - concept of boundary layer and its growth - flow in channels, rapidly varied flow - tanks and pipes - Hydrologic cycle - Rainfall - draw down – recuperation test – well yield - Water resources of Tamil Nadu – Water policy – flood control – drought management.

Water quality standards – Intakes - Estimation of demand - Unit processes and operations for water treatment - Maintenance of treatment units - Conveyance and distribution systems of treated water - Rural water supply- Advanced water treatment.

Collection of waste water- Design of sewers - Sewage pumping - Characteristics of sewage - Primary, secondary and tertiary treatment of sewage- Sludge disposal - effluent standards - industrial wastewater management – Rural sanitation – solid waste management.

Architecture (UG Degree Standard)

UNIT I: HUMAN SETTLEMENTS PLANNING (15 Questions)

- Origin of Human settlements In India & the rest of the world – River valley civilizations(Indus Valley, Mesopotamia, Egypt & China) – Traditional planning principles in India – Vernacular architecture of India – approaches & concepts – Classical & Medieval planning in Europe - Evolution of modern planning concepts – Garden city concept, Neighbourhood concept, Geddesian triad, etc.
- Elements of Human settlements – functions & linkages, Structure & form
- Urban Planning & Renewal.
- DCR
- Issues in contemporary Urban planning.

UNIT II: URBAN STUDIES – URBAN DESIGN, URBAN HOUSING & CONSERVATION (15 Questions)

- Urban Design – need, aspects, scope & components of urban space
 - Historic urban form of Greek, Roman, Medieval, Renaissance, Modern & post-modern periods - Indian Urbanism – temple towns, Mughal city form, medieval cities, colonial urbanism, planned capital cities - Theorizing & Reading urban space – Imageability & townscape elements, genius loci, collective memory, historic reading of the city & its artefacts by Rossi, social aspects of urban space, gender &

class, contribution of Jane Jacobs, William Whyte - Issues of Urban space.

- Housing issues in the Indian Context, Socio-Economic aspects, Housing Standards, Site Planning & Housing Design, Housing Process.
- Conservation – Definition, understanding the need & purpose, Adaptive re- use, International agencies & their role in conservation Conservation In India – Role of ASI & INTACH – policies & legislations, case studies – craft issues – Conservation practice – listing, documenting, assessing architectural character, structure report & developing guidelines – Urban Conservation – Conservation Planning – Heritage tourism.

UNIT III: ENVIRONMENTAL STUDIES, SITE PLANNING & LANDSCAPE ECOLOGY (10 Questions)

- Environment, Ecosystems & bio-diversity – Environmental Pollution, Human population & social issues with relation to the environment – Environmental laws in India.
- Site Planning – Introduction to basic terminologies, Methods of surveying, Instruments & Application, Leveling, Site Drawings, Importance of Site Analysis – On-site & off-site factors, Study of micro climate, Site Diagramming, Site Context, Site planning & Site layout principles.
- Introduction to Landscape Architecture – Elements of Landscape Design – plant material, water & landforms, Garden Design – Japanese, Italian Renaissance & Mughal, Site Planning – Organisation of spaces – circulation, built form and open spaces, site planning and micro climate, site planning for neighbourhood parks, children's play area and campus development – Landscaping of Functional areas – Urban open spaces and principle of urban landscape – Street landscaping, landscape design for waterfront areas and functional areas in urban centers – green roofs and walls – Street lighting.

28. Town Planning (PG Degree Standard)

Code: 519

UNIT I: INTRODUCTION TO PLANNING – SCOPE AND CONTENT (25 Questions)

Planning System in India, Regional Plan, Master Plan, Structure Plan, Detailed Development Plans, City Corporate Plan and Smart City Plan. New Town concepts, case studies in India & U.K. – Concept of Region, Types of Region, Techniques of Regional Analysis, Growth Model, Regional disparities, Resources in Regional development. Multi-level Planning – Regional Planning in India, Regional Plan case Studies, USA, U.K., Japan.

UNIT II: PLANNING THEORY AND TECHNIQUES (20 Questions)

Process of evolution of human settlement planning – Principles in Planning – Rationality in Planning, Blueprint and Process mode, Disjointed Incremental mode of Planning, Normative versus Functional mode of Planning – Type of planning surveys, data identification for various plan preparation. Delphi, Trade off-game, Simulation models, Gravity analysis, Lowry model, Threshold analysis, Multivariate analysis – Optimization and economic analysis methods in project formulation and implementation, PBBS – URDPFI Guidelines.

UNIT III: URBAN SOCIOLOGY, ECONOMICS, GEOGRAPHY: THEORIES AND APPLICATIONS (15 Questions)

Socio-economic groups, structures and Institutions as related to urban and rural communities - Ecological processes and structures in Indian Cities - Social Change & Economic Development - Agglomeration economics- Economics of scale, Multiplier effect concept, scope, limitation – Basic and non-basic activities of economics base, methods of base identification - Land-use determinants, Locational Dynamics of urban Land-use - Spatial organization of Urban settlements - City-region, Urban Sprawl and Fringe - Urbanization in India and Tamil Nadu with reference to settlements and population distribution.

UNIT IV: ENVIRONMENTAL ISSUES RELATED TO PLANNING (15 Questions)

Components of Environment – Classification of Environmental Resources - Purpose and Objectives in Environmental Protection - Institutional and Legal Support in management of the Environment – Environmental Policies, and issues -Environmental Impact Assessment Practice in India - Types,

Conceptual Approach and Phases of EIA – Impact Identification - Public Participation in the Process of Environmental Decision Making Process - Environmental Concepts – Sustainable Planning – Eco Cities, Compact Cities, Smart growth, Sponge city, IGBC Rating Systems applicable for Towns.

UNIT V: URBAN INFRASTRUCTURE NETWORK PLANNING ISSUES (15 Questions)

Obligatory and Discretionary Services, Implication of Urban Form and Size on Services, Norms and Standards, National Building Code, 2016. National and Local guidelines – Demand Strategy, Issues and Tasks, Operation and Management Aspects of each Service - Water Supply, Sewerage / Drainage, Solid Waste Management, Roads and Street Lighting - Priority, Placement Network Options, Effective System Analysis – Private and Public partnership and innovative concepts and practices in Infrastructure Development.

UNIT VI: PROJECT FORMULATION AND IMPLEMENTATION (15 Questions)

Types of Project, Project Cycle, Identification, Selection, Preparation – Capital Investment Programme, Internal Rate of Return, Net present Value Cost - Benefit & Analysis, Social Cost Benefit analysis, Budgeting, Tamil Nadu Transparency in Tender Rules – Appraisal techniques –Project Proposal and objectives, Current base line conditions, Financial and Economical Appraisal, Sociocultural assessment – Process Monitoring – Key issues, Monitoring Schedule, Data collection, Design, strategy, Impact Evaluation – Approaches, Key issues, Alternative to large scale qualitative Evaluation designs.

UNIT VII: PLANNING LEGISLATION AND LEGAL FRAME WORK (25 Questions)

The concept of law, Indian Constitution. Rights of Ownership and development of property. Statutory control as a positive tool in plan preparation and implementation - Evolution, scope and Significance of Planning Legislation. History and survey of development of planning legislation in India - Panchayat Act, Municipality Act, Corporation Act, TNULB Act, Land Acquisition, Rehabilitation and Resettlement Act, 2013. Provisions in the above acts related to functions, powers, role and responsibilities of local bodies including elected representatives and officers - 73rd and 74th CAA and their implications on planning and development. Local Body finance, revenue, expenditure and resource mobilization -T&C Planning Act of Tamil Nadu 1971, The Ancient Monuments and Archaeological Sites and Remains Act, Tamil Nadu Combined Development and Building rules 2019, The Tamil Nadu street vendors scheme, The Tamil Nadu Real Estate (Regulation and Development) Act, 2016.

UNIT VIII: ISSUES IN TRAFFIC AND TRANSPORTATION PLANNING (25 Questions)

Highway classification - Traffic characteristics – Horizontal and Vertical alignment, Land use & Transportation relationships - Sight distance – Cross- sectional elements – at grade and Grade separated intersections - Volume Count – Origin and Destination – Parking and Public Transport - Surveys – Inventory of Transport facilities – Methods of Survey – Different modes – Capacities – Limitations – Planning Aspects - Coordination – Para Transit modes – Private transport – Urban Transportation Planning Process – Trip Generation – Trip Distribution – Modal Split – Trip Assignment, Congestion pricing, Non-Motorized Transport, Transit Oriented Development, Bus Rapid Transit System, Unified Transport Authority

UNIT IX: REMOTE SENSING AND G.I.S., IN PLANNING (20 Questions)

Basics of Remote Sensing and GIS - Classification of spatial and non- spatial data - Application of spatial data in urban and regional planning - Identification of required spatial data layers - Coding schemes – digitization of spatial data – editing spatial data usable for the given planning problem – Land use Suitability Analysis, Land use Modeling, Existing Land use Preparation using Mobiles, Satellite Imageries, Aerial Photographs, Drones in Physical Planning.

UNIT X: CURRENT TRENDS AND ISSUES IN PLANNING (25 Questions)

Concepts of sustainable urban development, sustainable Transportation, E–Governance, HRIDAY, Rurban Mission, Swachh Bharat Mission, AMRUT, National Health Mission, Public private partnership, local bodies and urban finance. Land Pooling concept, Transfer of Development Right, Accommodation Reservation, Formulation of Re-development and Urban Expansion Plans - Local Area Plans, Town Planning Schemes - Special Economic Zone, Value Capture Finance Policy Framework – Swiss Challenge Model, Industrial Corridor, Coastal Zone Management Plan.

29. Zoology and Medical Entomology (PG Degree Standard)

Code: 567

UNIT I: (20 Questions)

General Organization of Non-Chordate and Chordate - Classification upto Class Level - Structure of Cell - Cellular Organization - Membrane, Intercellular - Structure and Function - Cellular organelles. Chromosomes - Types and Organization of Genes. Cell Division, Cell Cycle and Regulation. Cell Communication and Cell Signaling. Structure of DNA and RNA. Genetic Code, Replication and Protein Synthesis.

Bio-Chemistry: Structure of Carbohydrates, Amino Acids, Proteins, Lipids - Glycolysis and Krebs's cycle - Oxidation, Reduction - Oxidative Phosphorylation - Energy conservation and release - Cyclic AMP - ATP - Saturated and Unsaturated Fatty acids - Cholesterol - Enzymes, Mechanism, Action and Kinetics. Vitamins, Trace elements and Micronutrients and Co-enzymes. Antioxidant enzymes, Hormones - Classification, Biosynthesis and functions.

UNIT II: (20 Questions)

Physiology: With reference to Mammals digestion, Role of Salivary gland, Liver, Pancreas and Intestinal Glands in Digestion, Nutrition, Balanced Diet in Man-Assimilation, Intermediary Metabolism. Composition of Blood - Coagulation - Mechanism of Respiration. Muscles - Mechanism of Muscle Contraction, Temperature Regulation, Acid, Base Balance and Homeostasis. Nerve Impulse Conduction, Neurotransmitters - Receptors, Photo, Phono and Chemo Reception. Nephron and Urine formation. Endocrine glands - Testis, Ovary and Hypothalamus - Hypophyseal gonadal relationship. Pheromones and Reproduction. Bioluminescence.

UNIT III: (20 Questions)

Immunology: Immune responses - Primary, Secondary and Theories. Immunity types - Innate -Acquired - Cell mediated and Humoral immunity - Autoimmunity, Types of Antigens and Immunoglobulins. Vaccinations - ELISA, RIA Techniques. Developmental Biology: Gametogenesis, Fertilization: Significance, Polyspermy Gynogenesis, Androgenesis, Parthenogenesis, Differentiation - Nuclear and Chemical factors, Inductors and Organizers. ART - Stem cell biology - Sources, Types and Applications.

UNIT IV: (20 Questions)

Resource Ecology and Management, Renewable and Non-Renewable natural resources. Energy resources - Conventional and Non-Conventional. Bioremediation. Habitat Ecology. Wild Life conservation, Management and Acts. Air, Water, Soil, Sound pollutions. Laws related to Environment and Environmental Protection Act. Space Ecology and Radiation Ecology. Climate Changes and Global Warming.

UNIT V: (20 Questions)

Medical Entomology - Scope and Definition Vectors of Medical Importance - Classification, Types of vectors (Mosquitoes, Sand fly, House fly, Bed bug, Human lice, Fleas) and their Identification, Epidemiology, Life cycle, Bionomics, Mechanism of diseases transmission. Protozoan Parasites and Diseases - Helminths, Parasites and Diseases on Man and Domestic Animals.

UNIT VI: (20 Questions)

Vector Borne Diseases spread through Mosquitoes - Malaria, Filariasis, Viral Encephalitis (Japanese Encephalitis, West Nile) Dengue, Chikungunya, Zika and Yellow fever.

UNIT VII: (20 Questions)

Vectors from class Arachnida and Crustacea (Ticks, Mites, Cyclops) and their Identification, Epidemiology, Life cycle and Diseases transmitted.

Vector borne diseases spread through Houseflies - Typhoid, Paratyphoid, Dysentery, Cholera and Amoebiasis.

Vector borne diseases spread through Sandfly - Kala azar, Oriental sore and Sleeping sickness.

Vector borne diseases spread through Louse - Epidemic typhus, Relapsing fever and Trench fever.

Vector borne diseases spread through Rat flea - Bubonic Plague and Endemic typhus.

Vector borne diseases spread through Hard and Soft ticks, Trombiculid Mite and Cyclops.

UNIT VIII: (20 Questions)

Classification of Insecticides of Public Health Importance (Larvicides and Adulticides) Mode of Action, Medical problems associated with Insecticides use. Occupational and accidental Poisoning of various Insecticides and their antidotes.

National Health Programmes related to vector control and prevention of diseases – National Vector Borne Disease Control Programme (NVBDCP).

UNIT IX: (20 Questions)

Bio-Physics: Microscopy-Principles of Phase, Electron Microscope, Polarising, Fluorescent, Interference Microscope. Photo - Electric Calorimetry, Freeze drying - Freezing, Microtome, Fixation, Staining techniques. X-ray - Diffraction, Ultra - Violet and Infra Red, Spectroscopy and Autoradiography. Instrumentation methods: Centrifugation, Electrophoretic and Chromatographic Techniques. PCR, DNA Finger Printing, RFLP, RAPD, AFLP, FISH and GISH.

UNIT X: (20 Questions)

Bio-Statistics: Collection of data. Primary and Secondary - Compiling and Sampling Methods -Frequency Distribution, Frequency Tables - Diagrammatic Representation - Variables - Measures of Control tendency. Standard deviation, Standard error - Correlation, Regression, Regression Analysis - Student's "t" Test and Chi-square Test. Bio-informatics: DNA and Protein Sequence Analysis, Prediction Functional Structure, Protein Folding, Molecular Docking, Metabolic and Regulatory Networks, General Challenges and Applications. SwissProt, NCBI: GENBANK, BLAST: Multiple Sequence Alignments.

Annexure IV

Instructions to be followed by the candidates

1. Written Examination

1.1. Reporting Time at the Examination Venue

1.1.1. To facilitate verification of the identity of the candidates and explanation of the procedures related to the examination, the candidates shall present themselves at the examination venue one hour before the time scheduled for the commencement of the examination.

1.1.2. All gates serving as entry into the examination venue shall be closed thirty minutes before the commencement of the examination. After that, no candidate shall be permitted to enter the premises of the examination venue.

1.1.3. In case of examinations to be held in both forenoon and afternoon sessions, the reporting time for the afternoon session shall also be thirty minutes before the commencement of the examination and no one shall be allowed into the venue thereafter.

1.2. Entry into the Examination Venue

1.2.1. Candidates shall present themselves at the examination venue with the memorandum of admission (hall ticket) downloaded from the Commission's website, failing which, they shall not be allowed to write the examination. Candidates shall also bring with them, a photocopy of their Aadhaar card / Passport / Driving Licence / Permanent Account Number (PAN) card / Voter ID card as identity proof.

1.2.2. Candidates must appear for the examination at the venue they have been allotted, as mentioned in the memorandum of admission (hall ticket). Change of venue will not be permitted. No candidate, without prior approval, shall be allowed to appear for the examination at a venue other than the one originally allotted.

1.2.3. Candidates may be subjected to frisking at the examination venue, if required, with the assistance of male/female police personnel or any authorized persons, as the case may be.

1.2.4. Parents and others who accompany the candidates will not be permitted inside the examination venue.

1.3. Memorandum of Admission (Hall Ticket)

1.3.1. If the photograph of the candidate in the memorandum of admission is not printed or not clear or does not match with candidate's appearance, he/she should furnish a separate photograph affixed on a plain paper, along with his name, address, register number and signature along with a copy of the memorandum of admission (hall ticket) and a copy of Aadhaar card / Passport / Driving Licence / Permanent Account Number (PAN) card / Voter ID card, to the Chief Invigilator, who shall countersign it. The identity proof in original, should also be shown to the room invigilator for verification. The room invigilator upon verification of the identity of the candidate, shall obtain an undertaking as to the genuineness of the candidate and to the effect that he/she is aware that he/she is liable to any criminal/penal action initiated by the Commission, if the information furnished is found to be incorrect at a later date. The undertaking shall then be handed over to the Chief Invigilator.

1.3.2. Candidates must show the memorandum of admission to the Invigilator / Chief Invigilator / inspection authorities / any authorized persons of the examination hall, on demand for verification.

1.3.3. The memorandum of admission should be preserved carefully and retained permanently. The memorandum of admission should be produced if shortlisted for the next stage of selection / whenever

sought by the Commission. The memorandum of admission may also be photocopied, as a precaution, after the examination is over. No duplicate memorandum of admission will be issued later.

1.4. Examination Room

1.4.1. The candidates shall compulsorily be seated in the examination room thirty minutes before the time scheduled for the commencement of the examination.

1.4.2. Water, tea, coffee, snacks, soft drinks, etc., will not be allowed inside the examination room.

1.4.3. Candidates should maintain strict discipline not only in the examination room but also inside the campus of the examination venue. Candidates found smoking / intoxicated or found to have entered into a quarrel of any kind, or to have misbehaved with the Chief Invigilator or with the inspection authorities or with the invigilator or with any other candidate either in the examination hall or inside the campus of the examination venue, either before, during or after the examination, are liable to invalidation of answer sheet and debarment for any period the Commission may deem fit, as well as appropriate criminal action.

1.4.4. Candidates suffering from serious health issues, may, with the consent of the Chief Invigilator, deposit medication or other medical requirements on the room invigilator's table for use if needed.

1.4.5. In case of extraordinary circumstances, like pandemic conditions, etc., the procedures / precautions prescribed (e.g., use of sanitizer and face mask, practicing social distancing) shall be adhered to.

1.5. Computer Based Test (CBT)

1.5.1. The Registration for the examination shall start one hour before the time scheduled for the commencement of the examination.

1.5.2. Each candidate will be assigned a Computer to take up the examination.

1.5.3. No computer knowledge is required to take up the Computer Based Test. Knowledge in Mouse operation would suffice to take up the Computer Based Test.

1.5.4. Candidates will be provided with a user name and password to login the system.

1.5.5. Use the keyboard only to key-in the Register Number, User id (registration id) and password.

1.5.6. Necessary instructions will be displayed on the screen. Kindly read all the instructions carefully and follow the instructions without fail.

1.5.7. Questions with five options each will be displayed in the computer screen.

1.5.8. One question will be displayed on the screen at a time.

1.5.9. The questions will appear on the screen in ascending order, which can be answered one by one.

1.5.10. Candidate can use only the mouse to select the correct answers and proceed with answering the questions.

1.5.11. To select your answer of a question, click on the button of one of the options.

1.5.12. Click on Save and Next button after answering every question to save your answer. Otherwise your answer will not be saved.

1.5.13. To deselect your chosen answer, click on the button of the chosen option again or click on the Clear Response button.

1.5.14. Candidates can proceed to the next question by clicking next button or previous question by clicking previous button.

1.5.15. Candidates can recheck his / her answers and if he / she feels to correct the answers, it can be done at any time before the closure of examination. They can skip the questions also, if they desire so.

1.5.16. Candidate can submit their answers at any time during the examination.


1.5.17. Once the entire answers are submitted, the candidates have no option to proceed further.


1.5.18. If the candidates fail to submit their answers, the system will automatically submit the answers to the server, at the closure of the examination.


1.5.19. The question and answers can be zoomed to the required level for the candidates with visual impairment.


1.5.20. Instruction for enlarging images, to view the image provided in the question in a bigger size, click on the image and rotate the scrolling wheel on the mouse.


1.5.21. Question Number Box: Question Number Box displayed on the right side of the screen will show the status of each question using one of the following symbols:

 You have not visited the question yet.

 You have not answered the question.



 You have answered the question.

 You have NOT answered the question, but have marked the question for review.

 You have answered the question and marked for review. This will be considered for evaluation.

The 'Marked for Review' status for a question simply indicates that you would like to look at that question again.

You can click on the ">" arrow which appears to the left of question number box to minimize the question number box. This will enable you to view the question on a bigger area of the screen. To view the question number box again, you can click on "<" arrow which appears on the right side of the screen.

You can click on  to navigate to the bottom and  to navigate to the top of the question area, without scrolling. The summary of number of questions answered, not answered, not visited, marked for review and answered and marked for review will be displayed above the question number box.

1.5.22. Time available for the candidate to complete the examination will be displayed through a countdown timer in the top right-hand corner of the screen. It will display the remaining time as Time Left. (For example: if duration of examination is 3 hours, at the beginning of exam, timer will show 180 minutes and for Differently Abled candidates with scribe / without scribe 240 minutes, which will reduce gradually with passage of time). When the timer reaches zero, the examination will end by itself and the examination will be submitted by the system automatically.

1.5.23. Candidates will be provided with a paper for doing rough work. After closure of the examination, rough sheet will be collected.

1.5.24. Candidates have to sign the attendance sheet and affix thumb impression for verification of his / her identity.

1.5.25. The Examination Hall will be under camera surveillance.

1.5.26. Any attempt of malpractice found, will render you liable to such penal action as the Commission may decide.

1.5.27. In case of doubt in the questions and answers, English version is the final.

1.5.28. To acquaint with the operation of Mouse and the CBT, the candidates can take up the mock test available in the Commission's website (www.tnpsc.gov.in) and they can practice the usage of mouse in the mock test. Mock test is similar to the CBT to be held on the day of examination. In the Mock test, all the steps are given similar to the CBT. Candidates can practice the mock test as many times as he / she likes.

1.6. Other Instructions

1.6.1. No candidate will be allowed to leave the examination hall until the closure of the examination.

1.6.2. Requests from candidates for furnishing of their marks before the completion of the entire selection process, will not be entertained by the Commission.

1.7. Instructions for Usage of scribe and Compensatory Time

1.7.1. Candidates with Disability

1.7.1.1. Candidates with disability, shall be permitted to utilize the services of a scribe upon making such request in the online application subject to the following conditions. Request for scribe made after the submission of application or on the date of examination will receive no attention.

1.7.1.2. For the candidate with disability as defined under section 2(s) of the Rights of Persons with Disability Act, 2016, the facility of scribe and/or compensatory time shall be granted solely to those having difficulty in writing subject to uploading of a certificate to the effect that person concerned has limitation to write, including that of speed and that scribe is essential to write examination on his/her behalf from the Medical Board as per the format available in Annexure II . Compensatory time of not less than 20 minutes per hour of examination will be allowed to candidates with disability, who have physical limitation to write including that of speed and who are utilizing the services of a scribe. The candidate with disability should upload the Certificate of Disability in the format prescribed in Annexure II and the Certificate from the Medical Board in the format available in Annexure VI at the time of submission of online application.

1.7.2. Candidates with Benchmark Disability

1.7.2.1. Candidates with benchmark disability, shall be permitted to utilize the services of a scribe / compensatory time upon making such request in the online application subject to the following conditions. Request for scribe / compensatory time made after the submission of application or on the date of examination will receive no attention.

1.7.2.2. Candidate with benchmark disability as defined under section 2(r) of the Rights of Persons with Disability Act, 2016, in the category of blindness, locomotor disability (both arm affected) and cerebral palsy, the facility of scribe shall be given, if so desired by the candidate. Compensatory time of not less than 20 minutes per hour of examination will be allowed to candidates with blindness, locomotor disability (both arm affected) and cerebral palsy and who are utilizing /not utilizing the services of a scribe. The candidates with benchmark disability in the category of blindness, locomotor disability (both arm affected) and cerebral palsy should upload the Certificate of Disability in the format prescribed in Annexure II, at the time of submission of online application.

1.7.2.3. In case of other category of benchmark disability, the provision of scribe can be allowed on uploading of a certificate from the Chief Medical Officer / Civil Surgeon / Medical Superintendent of a Government Health care institution, to the effect that person concerned has limitation to write, including

that of speed and that scribe is essential to write examination on his/her behalf. Compensatory time of not less than 20 minutes per hour of examination will be allowed to candidates with other category of benchmark disability and who are utilizing the services of a scribe. The format of the certificate is available in Annexure II. The candidates with other category of benchmark disability should upload the Certificate of Disability in the format prescribed in Annexure II and the Certificate from the Chief Medical Officer / Civil Surgeon / Medical Superintendent of a Government Health care institution in the format available in the Annexure VI, at the time of submission of online application.

1.7.2.4. All candidates with benchmark disability who have physical limitation with regard to writing including that of speed and not availing the services of a scribe will be allowed additional time of a minimum of one hour for an examination of three hours duration, on production of a certificate from the Chief Medical Officer / Civil Surgeon / Medical Superintendent of a Government Health care institution, to the effect that person concerned has limitation to write and compensatory time is recommended. Such candidates with benchmark disability should upload the Certificate of Disability in the format prescribed in Annexure II and the Certificate from the Chief Medical Officer / Civil Surgeon / Medical Superintendent of a Government Health care institution in the format available in Annexure VI at the time of submission of online application.

1.7.3. The Commission will arrange for scribes and the fee amount to be paid to the scribes will be met by the Commission. Candidates availing of the services of the scribes need not pay any fee to them.

1.8. Special Instructions for the Candidates with Benchmark Disabilities

Candidates with locomotor disability and visual impairment who have been permitted to use scribe facility, who are unable to affix their signature, may affix their left hand thumb impression alone. Candidates who are unable to use their left hand, must affix right hand thumb impression. Candidates who are unable to use both hands, and who have been permitted to use scribe, may leave the signature and thumb impression columns blank.

1.9. Penalty for Violation of Commission's Instructions

1.9.1. Invalidation of Answersheet: Answer sheet answered other than the subject opted by the candidate in the online application / specified in the Hall Ticket will be invalidated.

1.9.2. Criminal Action: Criminal action will be initiated against the candidates for the following reasons.

1.9.2.1. Misbehaviour and indiscipline in the examination hall: Candidates should maintain strict discipline not only in the examination room, but also inside the campus of the examination venue. Candidates found smoking / intoxicated, or found to have entered into a quarrel of any kind, or to have misbehaved with the Chief Invigilator or with the inspection authorities or with the invigilator or with any other candidate either in the examination hall or inside the campus of the examination venue, either before, during or after the examination, are liable to invalidation of Answer sheet and debarment for any period the Commission may deem fit, as well as appropriate criminal action.

1.9.2.2. Indulging in any type of malpractice, including impersonation and resorting to unfair means within the examination hall or outside will lead to debarment for any period deemed fit by the Commission, besides initiation of criminal action.

- a. Consulting with / copying from another candidate in the examination hall.
- b. Permitting others to copy from his/her Answer Sheet.
- c. Seeking the help / assistance of any official / hall supervisor in answering questions in examination hall.
- d. Possession of electronic devices such as cellular phones, watches with inbuilt memory note, and rings with in-built memory notes, Bluetooth devices, communication chip, other electronic devices and non-electronic devices such as P&G design data book, books, notes, handbags, other non-permitted materials, etc.

1.9.3. Violation of any one or more of the instructions contained in the Commission's Instructions to Applicants, instructions mentioned in the Notification, instructions printed on the memorandum of admission (hall ticket) shall also make the candidate liable to debarment, either permanently or for such period as the Commission deems fit, and/or rejection of candidature after due process and /or any other penalty, as decided by the Commission.

1.9.4. Debarment

The period for which candidates shall be debarred from appearing for the examinations / participating in the recruitment processes conducted by the Commission, for the offences committed by the candidates are given below. Besides debarment, the candidate shall also be liable to rejection of candidature after due process, invalidation of answer sheet, as the case may be. Criminal action may also be initiated against such candidates wherever indicated.

S. No	Nature of Offence	Period of Debarment
1	Attempts to influence the Chairman, Members of the Commission, Secretary, Controller of Examinations or any officer or staff of the Commission, personally / by letter / through relatives, friends, patrons, officials or other persons.	Three Years
2	Production of bogus community / destitute widow / differently abled / ex-serviceman / transgender / person studied in Tamil medium certificates, etc. Tampering or alteration in the documents or certificates.	Permanent, Initiation of criminal action
3	Suppression of material information, at any stage of the selection process, regarding: (i) Previous appearances or availing free chances. (ii) Regular / temporary employment in Government or Quasi-Government organizations, local bodies, public sector undertakings, statutory bodies, public corporations, Universities, etc., (iii) Criminal cases, arrests, convictions, disciplinary proceedings, etc. (iv) Debarment or disqualification by Union Public Service Commission / State Public Service Commissions / other agencies	One Year
4	Possession of electronic devices such as cellular phones, watches and rings with in-built memory notes, Bluetooth devices, communication chip, any other electronic devices inside the examination room and also seeking the help of / assistance of any official / invigilator / any outsider in answering question	Permanent
5	Possession of non-electronic devices such as P&G Design Data Book, books, notes, guides, handbags, other non-permitted materials, etc. inside the examination room.	Three Years
6	Consulting with other candidates, copying from other candidates, permitting others to copy from his / her answer paper, copying from books or notes which are printed / typewritten / hand written, etc.	Three Years
7	In addition to the offences listed herein, the involvement of candidates in any indiscipline or irregular practices within / outside the examination room.	Three Years
8	Candidates found smoking / intoxicated, or found to have entered into a quarrel of any kind, or to have misbehaved with the Chief Invigilator or with the inspection authorities or with the invigilator or with any other candidate either in the examination hall or inside the campus of the examination venue, either before, during or after the examination.	Three Years
9	Indulging in grave malpractices, including impersonation, amounting to subversion of the conduct of examination.	Permanent, Initiation of criminal action

2. Answer Key Challenge for Objective Type Examination

2.1. Tentative answer keys will be hosted in the Commission's website within fifteen working days from the date of conduct of examination. Instructions available in the Para 17 D (iv) of Instructions to Applicants are not applicable to this recruitment. Candidates can challenge the tentative answer keys through the 'Answer Key Challenge' window available in the Commission's website (www.tnpsc.gov.in) [Recruitment → Answer Keys]. Representations, if any, challenging the tentative answer keys shall be submitted only through online mode within seven days from the date of publication of tentative answer keys. Representations received by post or e-mail will receive no attention.

2.2. Detailed instructions, procedures to challenge the tentative answer keys have been made available in the Commission's website. Representations made online/offline after the closure of the window will also receive no attention.

2.3. The challenges submitted on time, through the online mode, shall be referred to a committee comprising of experts in each subject. The decision on the final answer key shall be made, based on the recommendations of the expert committee and answer sheet evaluation shall commence thereafter.

2.4. The Commission shall not publish the final answer key until the completion of the entire selection process.

3. Onscreen Certificate Verification

3.1. Onscreen Certificate Verification will be done based on the documents already uploaded by the candidate at the time of online application.

3.2. Based on the onscreen certificate verification, the candidates will be given 10 calendar days to upload the required document(s) / defective document(s) or certificate(s). Failure to re-upload the required document(s) / defective document(s) or certificate(s) as per the claim in the online application within the time stipulated by the Commission, shall result in rejection of claim.

4. Physical Certificate Verification

4.1. Candidates admitted to physical certificate verification shall produce all the original certificates uploaded / re-uploaded (if applicable) for physical certificate verification as claimed in the online application, without fail.

4.2. After verification of original certificates, the eligible candidates alone will be admitted for interview. If the candidate does not satisfy the eligibility criteria, his/her online application will be rejected and his/her provisional admission to physical certificate verification will be cancelled and will not be allowed to attend the interview.

4.3. If the candidate does not appear for the physical certificate verification on the scheduled date and time, the candidate will not be given any further chance to appear for the physical certificate verification and will not be allowed to attend the interview.

5. Interview

5.1. Candidates should appear for the interview on the date and time notified by the Commission. The request for the change of date and time of interview will not be entertained.

5.2. If the candidate does not appear for the interview on the scheduled date and time, the candidate will not be given any further chance to appear for the interview and will not be considered for selection.

Annexure V

Forms for Experience Certificate

1. Experience Certificate for the post of Deputy Director (Legal) in Tamil Nadu Electricity Regulatory Commission (Post Code: 3540)

1.	Name of the Employee	
2.	Father / Spouse Name	
3.	Date of Birth	
4.	Designation of the Employee	
5.	Nature of the Work / Duty performed by the Employee (To be mentioned in brief)	
6.	Period of Experience	From ____ (date) To ____ (date)
7.	Total Experience (YY/MM/DD)	____ years ____ months ____ days
8.	Whether Attendance Register / Attendance Rolls / Pay Register and other records available for this Employee	Yes / No
9.	Name of the Organisation/ Institution	
10.	Type of Organisation/ Institution (strikeout whichever is not applicable)	Government / Large Private Sector / Quasi Government / Public Sector Undertaking
11.	Address of the Organisation/ Institution	
12.	Phone No. and Email ID of the Organisation/ Institution	

This is to certify that Thiru/Tmt./Selvi possesses said experience in a government / large private sector organization / quasi government undertaking / Public Sector undertaking etc. (strikeout whichever is not applicable) as on the date of notification (i.e., 07.05.2025). The above particulars furnished by me are correct.

Affix photograph of the employee with the signature of the Certifying Authority on the Photograph

Seal of Office / Officer:

Place
Date:

Signature
Name & Designation of the
Head of Organisation/ Institution /
Competent Authority

Note:

1. A certificate in the format prescribed should be obtained from the Head of the Organisation/ Institution wherein the individual had served or the authority competent to issue such certificate.
2. The competent authority who issues the certificate is cautioned that issuing of any certificate containing false details will lead to legal /penal action on them.

2. Experience Certificate for the post of Assistant Director (Statistical Analyst) in Tamil Nadu Electricity Regulatory Commission (Post Code: 3543)

1.	Name of the Employee	
2.	Father / Spouse Name	
3.	Date of Birth	
4.	Designation of the Employee	
5.	Nature of the Work / Duty performed by the Employee (To be mentioned in brief)	
6.	Whether the person possesses the experience involving analysis of information, sampling and reporting etc.	Yes / No
7.	Period of Experience	From ____ (date) To ____ (date)
8.	Total Experience (YY/MM/DD)	____ years ____ months ____ days
9.	Whether Attendance Register / Attendance Rolls / Pay Register and other records available for this Employee	Yes / No
10.	Name of the Organisation/ Institution	
11.	Type of Organisation/ Institution (strikeout whichever is not applicable)	Government organization / Research organization
12.	Address of the Organisation/ Institution	
13.	Phone No. and Email ID of the Organisation/ Institution	

This is to certify that Thiru/Tmt./Selvi possesses said experience in Government organization / Research organization, involving analysis of information sampling and reporting etc. (strikeout whichever is not applicable) as on the date of notification (i.e., 07.05.2025). The above particulars furnished by me are correct.

Affix photograph of the employee with the signature of the Certifying Authority on the Photograph

Seal of Office / Officer:

Place
Date:

Signature
Name & Designation of the
Head of Organisation/ Institution /
Competent Authority

Note:

1. A certificate in the format prescribed should be obtained from the Head of the Organisation/ Institution wherein the individual had served or the authority competent to issue such certificate.
2. The competent authority who issues the certificate is cautioned that issuing of any certificate containing false details will lead to legal /penal action on them.

3. Experience Certificate for the post of Manager (Mines) in the Tamil Nadu Cement Corporation Limited (Post Code: 3393)

1.	Name of the Employee	
2.	Father / Spouse Name	
3.	Date of Birth	
4.	Designation of the Employee	
5.	Nature of the Work / Duty performed by the Employee (To be mentioned in brief)	
6.	Whether the person possesses the experience in the field of Mining.	Yes / No
7.	Period of Experience in the field of Mining.	From ____ (date) To ____ (date)
8.	Total Experience (YY/MM/DD)	____ years ____ months ____ days
9.	Whether Attendance Register / Attendance Rolls / Pay Register and other records available for this Employee	Yes / No
10.	Name of the Organisation / Institution	
11.	Type of Organisation / Institution (Government / Quasi Government / Public Sector Undertaking / Private etc.)	
12.	Address of the Organisation / Institution	
13.	Phone No. and Email ID of the Organisation / Institution	

This is to certify that Thiru/Tmt./Selvi possesses said experience in field of Mining as stated above, as on the date of notification (i.e., 07.05.2025). The above particulars furnished by me are correct.

Affix photograph of the employee with the signature of the Certifying Authority on the Photograph

Seal of Office / Officer:

Place
Date:

Signature
Name & Designation of the
Head of Organisation / Institution /
Competent Authority

Note:

1. A certificate in the format prescribed should be obtained from the Head of the Organisation/ Institution wherein the individual had served or the authority competent to issue such certificate.
2. The Competent authority who issues the certificate is cautioned that issuing of certificate which contains false or incorrect details will lead to legal / penal action against them.

4. Experience Certificate for the post of Deputy Manager (Environment) in the Tamil Nadu Cement Corporation Limited (Post Code: 3398)

1.	Name of the Employee	
2.	Father / Spouse Name	
3.	Date of Birth	
4.	Designation of the Employee	
5.	Nature of the Work / Duty performed by the Employee (To be mentioned in brief)	
6.	Whether the person possesses the experience in the field of Environment	Yes / No
7.	Period of Experience in the field of Environment	From ____ (date) To ____ (date)
8.	Total Experience (YY/MM/DD)	____ years ____ months ____ days
9.	Whether Attendance Register / Attendance Rolls / Pay Register and other records available for this Employee	Yes / No
10.	Name of the Organisation / Institution	
11.	Type of Organisation / Institution (Government / Quasi Government / Public Sector Undertaking / Private etc.)	
12.	Address of the Organisation / Institution	
13.	Phone No. and Email ID of the Organisation / Institution	

This is to certify that Thiru/Tmt./Selvi possesses said experience in field of Environment as stated above, as on the date of notification (i.e., 07.05.2025). The above particulars furnished by me are correct.

Affix photograph of the employee with the signature of the Certifying Authority on the Photograph

Seal of Office / Officer:

Place
Date:

Signature
Name & Designation of the
Head of Organisation / Institution /
Competent Authority

Note:

1. A certificate in the format prescribed should be obtained from the Head of the Organisation/ Institution wherein the individual had served or the authority competent to issue such certificate.
2. The Competent authority who issues the certificate is cautioned that issuing of certificate which contains false or incorrect details will lead to legal / penal action against them.

5. Experience Certificate for the post of Assistant Manager (Mines) in the Tamil Nadu Cement Corporation Limited (Post Code: 3404)

1.	Name of the Employee	
2.	Father / Spouse Name	
3.	Date of Birth	
4.	Designation of the Employee	
5.	Nature of the Work / Duty performed by the Employee (To be mentioned in brief)	
6.	Whether the person possesses the experience in the field of Mining	Yes / No
7.	Period of Experience in the field of mining	From ____ (date) To ____ (date)
8.	Total Experience (YY/MM/DD)	____ years ____ months ____ days
9.	Whether Attendance Register / Attendance Rolls / Pay Register and other records available for this Employee	Yes / No
10.	Name of the Organisation / Institution	
11.	Type of Organisation / Institution (Government / Quasi Government / Public Sector Undertaking / Private etc.)	
12.	Address of the Organisation / Institution	
13.	Phone No. and Email ID of the Organisation / Institution	

This is to certify that Thiru/Tmt./Selvi possesses said experience in the field of mining as stated above, as on the date of notification (i.e., 07.05.2025). The above particulars furnished by me are correct.

Affix photograph of the employee with the signature of the Certifying Authority on the Photograph

Seal of Office / Officer:

Place
Date:

Signature
Name & Designation of the
Head of Organisation / Institution /
Competent Authority

Note:

1. A certificate in the format prescribed should be obtained from the Head of the Organisation/ Institution wherein the individual had served or the authority competent to issue such certificate.
2. The Competent authority who issues the certificate is cautioned that issuing of certificate which contains false or incorrect details will lead to legal / penal action against them.

6. Experience Certificate for the post of Assistant Manager (P&A) in the Tamil Nadu Cement Corporation Limited (Post Code: 3486)

1.	Name of the Employee	
2.	Father / Spouse Name	
3.	Date of Birth	
4.	Designation of the Employee	
5.	Nature of the Work / Duty performed by the Employee (To be mentioned in brief)	
6.	Whether the person possesses the experience in the field of Personnel Administration out of which 3 years in the level of Executive (P&A) / Officer Cadre	Yes / No
7.	Period of Experience in the field of Personnel Administration	From ____ (date) To ____ (date)
8.	Total Experience (YY/MM/DD) in the field of Personnel Administration	____ years ____ months ____ days
9.	Period of experience in the level of Executive (P&A) / Officer cadre	From ____ (date) To ____ (date)
10.	Total Experience in the level of Executive (P&A) / Officer cadre (YY/MM/DD)	____ years ____ months ____ days
11.	Whether Attendance Register / Attendance Rolls / Pay Register and other records available for this Employee	Yes / No
12.	Name of the Organisation / Institution	
13.	Type of Organisation / Institution (Government / Quasi Government / Public Sector Undertaking / Private etc.)	
14.	Address of the Organisation / Institution	
15.	Phone No. and Email ID of the Organisation / Institution	

This is to certify that Thiru/Tmt./Selvi possesses said experience in the field of Personnel administration out of which 3 years in the level of Executive((P&A) / Officer Cadre as stated above, as on the date of notification (i.e., 07.05.2025). The above particulars furnished by me are correct.

Affix photograph of the employee with the signature of the Certifying Authority on the Photograph

Seal of Office / Officer:

Place
Date:

Signature
Name & Designation of the
Head of Organisation / Institution /
Competent Authority

Note:

1. A certificate in the format prescribed should be obtained from the Head of the Organisation/ Institution wherein the individual had served or the authority competent to issue such certificate.
2. The Competent authority who issues the certificate is cautioned that issuing of certificate which contains false or incorrect details will lead to legal / penal action against them.

**7. Experience Certificate for the post of Factory Manager (SKD) in the Tamil Nadu Magnesite Ltd.
(Post Code: 3595)**

1.	Name of the Employee	
2.	Father / Spouse Name	
3.	Date of Birth	
4.	Designation of the Employee	
5.	Nature of the Work / Duty performed by the Employee in Mineral processing (Lightly, Calcined Magnesite, Graphite, Copper, Zinc, Iron etc.) (to be mentioned in brief)	
6.	Whether the person possesses the experience in the field at Senior level	Yes / No
7.	Period of Experience	From ____ (date) To ____ (date)
8.	Total Experience (YY/MM/DD)	____ years ____ months ____ days
9.	Whether Attendance Register / Attendance Rolls / Pay Register and other records available for this Employee	Yes / No
10.	Name of the Organisation / Institution	
11.	Type of Organisation / Institution (Government / Quasi Government / Public Sector Undertaking / Private etc.)	
12.	Address of the Organisation / Institution	
13.	Phone No. and Email ID of the Organisation / Institution	

This is to certify that Thiru/Tmt./Selvi possesses said experience at senior level as stated above, as on the date of notification (i.e., 07.05.2025). The above particulars furnished by me are correct.

Affix photograph of the employee with the signature of the Certifying Authority on the Photograph

Seal of Office / Officer:

Place
Date:

Signature
Name & Designation of the
Head of Organisation / Institution /
Competent Authority

Note:

1. A certificate in the format prescribed should be obtained from the Head of the Organisation/ Institution wherein the individual had served or the authority competent to issue such certificate.
2. The Competent authority who issues the certificate is cautioned that issuing of certificate which contains false or incorrect details will lead to legal / penal action against them.

**8. Experience Certificate for the post of Factory Manager (RKD) in the Tamil Nadu Magnesite Ltd.
(Post Code: 3596)**

1.	Name of the Employee	
2.	Father / Spouse Name	
3.	Date of Birth	
4.	Designation of the Employee	
5.	Nature of the Work / Duty performed by the Employee in Mineral processing (Dead Burnt Magnesite, Graphite, Copper, Zinc, Iron etc.) (To be mentioned in brief)	
6.	Whether the person possesses the experience in the field at Senior level	Yes / No
7.	Period of Experience	From ____ (date) To ____ (date)
8.	Total Experience (YY/MM/DD)	____ years ____ months ____ days
9.	Whether Attendance Register / Attendance Rolls / Pay Register and other records available for this Employee	Yes / No
10.	Name of the Organisation / Institution	
11.	Type of Organisation / Institution (Government / Quasi Government / Public Sector Undertaking / Private etc.)	
12.	Address of the Organisation / Institution	
13.	Phone No. and Email ID of the Organisation / Institution	

This is to certify that Thiru/Tmt./Selvi possesses said experience at senior level as stated above, as on the date of notification (i.e., 07.05.2025). The above particulars furnished by me are correct.

Affix photograph of the employee with the signature of the Certifying Authority on the Photograph

Seal of Office / Officer:

Place
Date:

Signature
Name & Designation of the
Head of Organisation / Institution /
Competent Authority

Note:

1. A certificate in the format prescribed should be obtained from the Head of the Organisation/ Institution wherein the individual had served or the authority competent to issue such certificate.
2. The Competent authority who issues the certificate is cautioned that issuing of certificate which contains false or incorrect details will lead to legal / penal action against them.

9. Experience Certificate for the post of Assistant General Manager (Projects) Infrastructure, in the Tamil Nadu Industrial Development Corporation (Post Code: 3345)

1.	Name of the Employee	
2.	Father / Spouse Name	
3.	Date of Birth	
4.	Qualification possessed by the Employee on the date of joining service	
5.	Designation of the Employee	
6.	Nature of the Work / Duty performed by the Employee (To be mentioned in brief)	
7.	Whether the person possesses the experience in the field of Infrastructure Sector	Yes / No
8.	Whether the person possesses the experience in the field of project management, procurements, Bid process management	Yes / No
9.	Period of Experience in the field of Infrastructure Sector	From ____ (date) To ____ (date)
10.	Total Experience (YY/MM/DD)	____ years ____ months ____ days
11.	Whether Attendance Register / Attendance Rolls / Pay Register and other records available for this Employee	Yes / No
12.	Name of the Organisation/ Institution	
13.	Type of Organisation / Institution (Government / Quasi Government / Public Sector Undertaking / Private etc.)	
14.	Address of the Organisation/ Institution	
15.	Phone No. and Email ID of the Organisation/ Institution	

This is to certify that Thiru/Tmt./Selvi possesses said experience in Infrastructure Sector as on the date of notification (i.e., 07.05.2025). The above particulars furnished by me are correct.

Affix photograph of the employee with the signature of the Certifying Authority on the Photograph

Seal of Office / Officer:

Place
Date:

Signature
Name & Designation of the
Head of Organisation/ Institution /
Competent Authority

Note:

1. A certificate in the format prescribed should be obtained from the Head of the Organisation/ Institution wherein the individual had served or the authority competent to issue such certificate.
2. The competent authority who issues the certificate is cautioned that issuing of any certificate containing false details will lead to legal /penal action on them.

10. Experience Certificate for the post of Assistant General Manager (Projects), Project Management Tamil Nadu Industrial Development Corporation (Post Code: 3344)

1.	Name of the Employee	
2.	Father / Spouse Name	
3.	Date of Birth	
4.	Qualification possessed by the Employee on the date of joining service	
5.	Designation of the Employee	
6.	Nature of the Work / Duty performed by the Employee (To be mentioned in brief)	
7.	Whether the person possesses the experience in the field of Project and Contract Management	Yes / No
8.	Whether the person possesses the experience in the field of Procurements, Bid Process Management	Yes / No
9.	Period of Experience in the field of Project and Contract Management	From ____ (date) To ____ (date)
10.	Total Experience (YY/MM/DD)	____ years ____ months ____ days
11.	Whether Attendance Register / Attendance Rolls / Pay Register and other records available for this Employee	Yes / No
12.	Name of the Organisation/ Institution	
13.	Type of Organisation / Institution (Government / Quasi Government / Public Sector Undertaking / Private etc.)	
14.	Address of the Organisation/ Institution	
15.	Phone No. and Email ID of the Organisation/ Institution	

This is to certify that Thiru/Tmt./Selvi possesses said experience in Project and Contract Management as on the date of notification (i.e., 07.05.2025). The above particulars furnished by me are correct.

Affix photograph of the employee with the signature of the Certifying Authority on the Photograph

Seal of Office / Officer:

Place
Date:

Signature
Name & Designation of the
Head of Organisation/ Institution /
Competent Authority

Note:

1. A certificate in the format prescribed should be obtained from the Head of the Organisation/ Institution wherein the individual had served or the authority competent to issue such certificate.
2. The competent authority who issues the certificate is cautioned that issuing of any certificate containing false details will lead to legal /penal action on them.

11. Experience Certificate for the post of Assistant Secretary in the Tamil Nadu Industrial Development Corporation (Post Code: 3360)

1.	Name of the Employee	
2.	Father / Spouse Name	
3.	Date of Birth	
4.	Qualification possessed by the Employee on the date of joining service	
5.	Designation of the Employee	
6.	Nature of the Work / Duty performed by the Employee (To be mentioned in brief)	
7.	Whether the person possesses the experience in the field of Company or Secretarial Consultancy	Yes / No
8.	Period of Experience in a Company or Secretarial Consultancy	From ____ (date) To ____ (date)
9.	Total Experience (YY/MM/DD)	____ years ____ months ____ days
10.	Whether Attendance Register / Attendance Rolls / Pay Register and other records available for this Employee	Yes / No
11.	Name of the Organisation / Institution	
12.	Type of Organisation / Institution (Government / Quasi Government / Public Sector Undertaking / Private etc.)	
13.	Address of the Organisation / Institution	
14.	Phone No. and Email ID of the Organisation / Institution	

This is to certify that Thiru/Tmt./Selvi possesses said experience in a Company or Secretarial Consultancy as stated above, as on the date of notification (i.e., 07.05.2025). The above particulars furnished by me are correct.

Affix photograph of the employee with the signature of the Certifying Authority on the Photograph

Seal of Office / Officer:

Place
Date:

Signature
Name & Designation of the
Head of Organisation / Institution /
Competent Authority

Note:

1. A certificate in the format prescribed should be obtained from the Head of the Organisation/ Institution wherein the individual had served or the authority competent to issue such certificate.
2. The Competent authority who issues the certificate is cautioned that issuing of certificate which contains false or incorrect details will lead to legal / penal action against them.

12. Experience Certificate for the post of Scientist 'C' in Forest Department (Post Code: 3340)

1.	Name of the Employee	
2.	Father / Spouse Name	
3.	Date of Birth	
4.	Designation of the Employee	
5.	Nature of the Work / Duty performed by the Employee (To be mentioned in brief)	
6.	Whether the person possesses the experience in the field of plan or supervising or managerial level in research field of wildlife Management after acquiring the Ph.D.	Yes / No
7.	Period of Experience	From ____ (date) To ____ (date)
8.	Total Experience (YY/MM/DD)	____ years ____ months ____ days
9.	Whether Attendance Register / Attendance Rolls / Pay Register and other records available for this Employee	Yes / No
10.	Name of the Organisation/ Institution	
11.	Type of Organisation / Institution (Government / Quasi Government / Public Sector Undertaking / Private etc.)	
12.	Address of the Organisation/ Institution	
13.	Phone No. and Email ID of the Organisation/ Institution	

This is to certify that Thiru/Tmt./Selvi possesses said experience in the field of plan or supervising or managerial level in research field of wildlife Management after acquiring the Ph.D. as on the date of notification (i.e., 07.05.2025). The above particulars furnished by me are correct.

Affix photograph of the employee with the signature of the Certifying Authority on the Photograph

Seal of Office / Officer:

Place
Date:Signature
Name & Designation of the
Head of Organisation/ Institution /
Competent Authority**Note:**

1. A certificate in the format prescribed should be obtained from the Head of the Organisation/ Institution wherein the individual had served or the authority competent to issue such certificate.
2. The competent authority who issues the certificate is cautioned that issuing of any certificate containing false details will lead to legal /penal action on them.

13. Experience Certificate for the post of Chief Sthapathi in Hindu Religious and Charitable Endowments Department (Post Code: 3525)

1.	Name of the Employee	
2.	Father / Spouse Name	
3.	Date of Birth	
4.	Designation of the Employee	
5.	Nature of the Work / Duty performed by the Employee (To be mentioned in brief)	
6.	Whether the person possesses the experience in the field of temple renovation	Yes / No
7.	Period of Experience in the field of temple renovation	From ____ (date) To ____ (date)
8.	Total Experience (YY/MM/DD)	____ years ____ months ____ days
9.	Whether Attendance Register / Attendance Rolls / Pay Register and other records available for this Employee	Yes / No
10.	Name of the Organisation/ Institution	
11.	Type of Organisation / Institution (Government / Quasi Government / Public Sector Undertaking / Private etc.)	
12.	Address of the Organisation/ Institution	
13.	Phone No. and Email ID of the Organisation/ Institution	

This is to certify that Thiru/Tmt./Selvi possesses said experience in the field of temple renovation as on the date of notification (i.e., 07.05.2025). The above particulars furnished by me are correct.

Affix photograph of the employee with the signature of the Certifying Authority on the Photograph

Seal of Office / Officer:

Place
Date:

Signature
Name & Designation of the
Head of Organisation/ Institution /
Competent Authority

Note:

1. A certificate in the format prescribed should be obtained from the Head of the Organisation/ Institution wherein the individual had served or the authority competent to issue such certificate.
2. The competent authority who issues the certificate is cautioned that issuing of any certificate containing false details will lead to legal /penal action on them.

14. Experience Certificate for the post of Regional Sthapathi in Hindu Religious and Charitable Endowments Department (Post Code: 3526)

1.	Name of the Employee	
2.	Father / Spouse Name	
3.	Date of Birth	
4.	Designation of the Employee	
5.	Nature of the Work / Duty performed by the Employee (To be mentioned in brief)	
6.	Whether the person possesses the experience in the field of temple renovation	Yes / No
7.	Period of Experience in the field of temple renovation	From ____ (date) To ____ (date)
8.	Total Experience (YY/MM/DD)	____ years ____ months ____ days
9.	Whether Attendance Register / Attendance Rolls / Pay Register and other records available for this Employee	Yes / No
10.	Name of the Organisation/ Institution	
11.	Type of Organisation / Institution (Government / Quasi Government / Public Sector Undertaking / Private etc.)	
12.	Address of the Organisation/ Institution	
13.	Phone No. and Email ID of the Organisation/ Institution	

This is to certify that Thiru/Tmt./Selvi possesses said experience in the field of temple renovation as on the date of notification (i.e., 07.05.2025). The above particulars furnished by me are correct.

Affix photograph of the employee with the signature of the Certifying Authority on the Photograph

Seal of Office / Officer:

Place
Date:

Signature
Name & Designation of the
Head of Organisation/ Institution /
Competent Authority

Note:

1. A certificate in the format prescribed should be obtained from the Head of the Organisation/ Institution wherein the individual had served or the authority competent to issue such certificate.
2. The competent authority who issues the certificate is cautioned that issuing of any certificate containing false details will lead to legal /penal action on them.

15. Experience Certificate for the post of Assistant Manager (Projects) in Tamil Nadu Urban Finance and Infrastructure Development Corporation Limited (Post Code: 3346)

1.	Name of the Employee	
2.	Father / Spouse Name	
3.	Date of Birth	
4.	Designation of the Employee	
5.	Nature of the Work / Duty performed by the Employee (To be mentioned in brief)	
6.	Whether the person possesses experience in appraisal / execution of Urban Infrastructure Projects in Public / Private limited Companies	Yes / No
7.	Period of Experience in appraisal / execution of Urban Infrastructure Projects in Public / Private limited Companies	From ____ (date) To ____ (date)
8.	Total Experience (YY/MM/DD)	____ years ____ months ____ days
9.	Whether Attendance Register / Attendance Rolls / Pay Register and other records available for this Employee	Yes / No
10.	Name of the Organisation / Institution	
11.	Type of Organisation / Institution [Public / Private Limited Company]	
12.	Address of the Organisation / Institution	
13.	Phone No. and Email ID of the Organisation / Institution	

This is to certify that Thiru/Tmt./Selvi possesses the said experience in appraisal / execution of Urban Infrastructure Projects in Public / Private limited Companies (Strike out whichever is not applicable) as stated above, as on the date of notification (i.e., 07.05.2025). The above particulars furnished by me are correct.

Affix photograph of the employee with the signature of the Certifying Authority on the Photograph

Seal of Office / Officer:

Place
Date:

Signature
Name & Designation of the
Head of Organisation / Institution /
Competent Authority

Note:

1. A certificate in the format prescribed should be obtained from the Head of the Organisation / Institution wherein the individual had served or the authority competent to issue such certificate.
2. The Competent authority who issues the certificate is cautioned that issuing of certificate which contains false or incorrect details will lead to legal / penal action against them.

16. Experience Certificate for the post of Assistant Director of Town and Country Planning in the Housing and Urban Development Department (Post Code: 1778)

1.	Name of the Employee	
2.	Father / Spouse Name	
3.	Date of Birth	
4.	Designation of the Employee	
5.	Nature of the Work / Duty performed by the Employee (To be mentioned in brief)	
6.	Period of Experience	From ____ (date) To ____ (date)
7.	Total Experience (YY/MM/DD)	____ years ____ months ____ days
8.	Whether Attendance Register / Attendance Rolls / Pay Register and other records available for this Employee	Yes / No
9.	Name of the Organisation/ Institution	
10.	Type of Organisation/ Institution [Town Planning Department of Government / Statutory Board / Urban Authority / University / Recognized Research Institution / Public Sector Undertaking / Semi-Government / Statutory / Autonomous Organization / Local Body]	
11.	Address of the Organisation / Institution	
12.	Phone No. and Email ID of the Organisation / Institution	

(a) **Other than Under Graduates in Planning**[@]

This is to certify that Thiru/Tmt./Selvi possess experience in Town Planning works in the Town Planning Department of Government/ Statutory Board / Urban Authority / University or Recognized Research Institution / Public Sector Undertaking / Semi-Government / Statutory / Autonomous Organization / Local Body as stated above, as on the date of notification (i.e., 07.05.2025). The above particulars furnished by me are correct.

(b) **Under Graduates in Planning**[@]

This is to certify that Thiru/Tmt./Selvi possess experience in the field of Urban or Regional Planning in the State Government / Statutory Board / Urban Authority / University / Recognized Research Institution / Public Sector Undertaking / Semi-Government / Statutory / Autonomous Organization / Local Body as stated above, as on the date of notification (i.e., 07.05.2025). The above particulars furnished by me are correct.

@ strike out whichever is not applicable.

Affix photograph of the employee with the signature of the Certifying Authority on the Photograph

Seal of Office / Officer:

Place
Date:

Signature
Name & Designation of the
Head of Organisation/ Institution /
Competent Authority

Note:

1. A certificate in the format prescribed should be obtained from the Head of the Organisation / Institution wherein the individual had served or the authority competent to issue such certificate.
2. The competent authority who issues the certificate is cautioned that issuing of any certificate containing false details will lead to legal / penal action on them.

17. Experience Certificate for the post of Assistant Superintendent (Chemical wing) in Micro, Small and Medium Enterprises Department (Post Code: 1894)

1.	Name of the Employee	
2.	Father / Spouse Name	
3.	Date of Birth	
4.	Designation of the Employee	
5.	Nature of the Work / Duty performed by the Employee (To be mentioned in brief)	
6.	Whether the person possesses experience in field of Research Institute or Engineering Workshop or Chemical Laboratory.	Yes / No
7.	Period of Experience	From ____ (date) To ____ (date)
8.	Total Experience (YY/MM/DD)	____ years ____ months ____ days
9.	Whether Attendance Register / Attendance Rolls / Pay Register and other records available for this Employee	Yes / No
10.	Name of the Organisation/ Institution	
11.	Type of Organisation/ Institution (strikeout whichever is not applicable)	Research Institute / Engineering Workshop / Chemical Laboratory
12.	Address of the Organisation/ Institution	
13.	Phone No. and Email ID of the Organisation/ Institution	

This is to certify that Thiru/Tmt./Selvi possesses said experience in a Research Institute or Engineering Workshop or Chemical Laboratory as on the date of notification (i.e., 07.05.2025). The above particulars furnished by me are correct.

Affix photograph
of the employee
with the signature
of the Certifying
Authority on the
Photograph

Seal of Office / Officer:

Place
Date:

Signature
Name & Designation of the
Head of Organisation/ Institution /
Competent Authority

Note:

1. A certificate in the format prescribed should be obtained from the Head of the Organisation/ Institution wherein the individual had served or the authority competent to issue such certificate.
2. The competent authority who issues the certificate is cautioned that issuing of any certificate containing false details will lead to legal /penal action on them.

18. Experience Certificate for the post of Assistant Planner in Chennai Metropolitan Development Authority (Post Code: 3542)

1.	Name of the Employee	
2.	Father / Spouse Name	
3.	Date of Birth	
4.	Designation of the Employee	
5.	Nature of the Work / Duty performed by the Employee (To be mentioned in brief)	
6.	Whether the person possesses experience in the field of Town Planning	Yes / No
7.	Period of Experience in the field of Town Planning	From ____ (date) To ____ (date)
8.	Total Experience (YY/MM/DD)	____ years ____ months ____ days
9.	Whether Attendance Register / Attendance Rolls / Pay Register and other records available for this Employee	Yes / No
10.	Name of the Organisation/ Institution / Firm	
11.	Type of Organisation/ Institution / Firm (strikeout whichever is not applicable)	Government /Public Sector Undertaking/ Registered Consultancy Firm
12.	Address of the Organisation/ Institution	
13.	Registration No. of Consultancy firm (if applicable)	
14.	Phone No. and Email ID of the Organisation/ Institution	

This is to certify that Thiru/Tmt./Selvi possesses said experience in Town Planning from Government / Public Sector Undertakings / Registered Consultancy Firm. as on the date of notification (i.e., 07.05.2025). The above particulars furnished by me are correct.

Affix photograph
of the employee
with the signature
of the Certifying
Authority on the
Photograph

Seal of Office / Officer:

Place
Date:

Signature
Name & Designation of the
Head of Organisation/ Institution /
Competent Authority

Note:

1. A certificate in the format prescribed should be obtained from the Head of the Organisation/ Institution wherein the individual had served or the authority competent to issue such certificate.
2. The competent authority who issues the certificate is cautioned that issuing of any certificate containing false details will lead to legal /penal action on them.

19. Experience Certificate for the post of Senior Accounts Officer in Chennai Metropolitan Water supply and Sewerage Board (Post Code: 3535)

1.	Name of the Employee	
2.	Father / Spouse Name	
3.	Date of Birth	
4.	Designation of the Employee	
5.	Nature of the Work / Duty performed by the Employee (To be mentioned in brief)	
6.	Whether the person possesses experience in the field of Chartered Accountant or Cost Accountant	Yes / No
7.	Period of Experience in the field of Chartered Accountant or Cost Accountant	From ____ (date) To ____ (date)
8.	Total Experience (YY/MM/DD)	____ years ____ months ____ days
9.	Whether Attendance Register / Attendance Rolls / Pay Register and other records available for this Employee	Yes / No
10.	Name of the Organisation/ Institution / Firm	
11.	Type of Organisation / Institution (Government / Quasi Government / Public Sector Undertaking / Private etc.)	
12.	Address of the Organisation/ Institution	
13.	Phone No. and Email ID of the Organisation/ Institution	

This is to certify that Thiru/Tmt./Selvi possesses said experience in Chartered Accountant or Cost Accountant as on the date of notification (i.e., 07.05.2025). The above particulars furnished by me are correct.

Affix photograph
of the employee
with the signature
of the Certifying
Authority on the
Photograph

Seal of Office / Officer:

Place
Date:

Signature
Name & Designation of the
Head of Organisation/ Institution /
Competent Authority

Note:

1. A certificate in the format prescribed should be obtained from the Head of the Organisation/ Institution wherein the individual had served or the authority competent to issue such certificate.
2. The competent authority who issues the certificate is cautioned that issuing of any certificate containing false details will lead to legal /penal action on them.

**20. Experience Certificate for the post of Psychologist in Prisons and Correctional Services
(Post Code: 1942)**

1.	Name of the Employee	
2.	Father / Spouse Name	
3.	Date of Birth	
4.	Designation of the Employee	
5.	Nature of the Work / Duty performed by the Employee (To be mentioned in brief)	
6.	Whether the person possesses the experience in testing or clinical work in the field of Psychology	Yes / No
7.	Period of Experience in testing or clinical work in the field of Psychology	From ____ (date) To ____ (date)
8.	Total Experience (YY/MM/DD)	____ years ____ months ____ days
9.	Whether Attendance Register / Attendance Rolls / Pay Register and other records available for this Employee	Yes / No
10.	Name of the Organisation/ Institution	
11.	Type of Organisation / Institution (Government / Quasi Government / Public Sector Undertaking / Private etc.)	
12.	Address of the Organisation/ Institution	
13.	Phone No. and Email ID of the Organisation/ Institution	

This is to certify that Thiru/Tmt./Selvi possesses said experience in testing or clinical work in the field of Psychology as on the date of notification (i.e., 07.05.2025). The above particulars furnished by me are correct.

Affix photograph of the employee with the signature of the Certifying Authority on the Photograph

Seal of Office / Officer:

Place
Date:

Signature
Name & Designation of the
Head of Organisation/ Institution /
Competent Authority

Note:

1. A certificate in the format prescribed should be obtained from the Head of the Organisation/ Institution wherein the individual had served or the authority competent to issue such certificate.
2. The competent authority who issues the certificate is cautioned that issuing of any certificate containing false details will lead to legal /penal action on them.

21. Experience Certificate for the post of Senior Entomologist in Public Health and Preventive Medicine (Post Code: 2032)

1.	Name of the Employee	
2.	Father / Spouse Name	
3.	Date of Birth	
4.	Qualification possessed by the Employee on the date of joining service	
5.	Designation of the Employee	
6.	Nature of the Work / Duty performed by the Employee (To be mentioned in brief)	
7.	Whether the person possesses Laboratory / Research experience in the field of Zoology / Entomology	Yes / No
8.	Period of Experience	From ____ (date) To ____ (date)
9.	Total Experience (YY/MM/DD)	____ years ____ months ____ days
10.	Whether Attendance Register / Attendance Rolls / Pay Register and other records available for this Employee	Yes / No
11.	Name of the Organisation/ Institution	
12.	Type of Organisation/ Institution / Firm	
13.	Whether the Organization / Institution is recognized by the University / State or Central Government Institution (strikeout whichever is not applicable)	University / State Government Institution / Central Government Institution
14.	Address of the Organisation/ Institution	
15.	Phone No. and Email ID of the Organisation/ Institution	

This is to certify that Thiru/Tmt./Selvi possesses the said Laboratory / Research experience relevant to the field of Zoology / Entomology for _____ years from _____ to _____ in an Institution recognized by the University / State or Central Government Institution as stated above, as on the date of notification (i.e., 07.05.2025). The above particulars furnished by me are correct.

Affix photograph of the employee with the signature of the Certifying Authority on the Photograph

Seal of Office / Officer:

Place
Date:

Signature
Name & Designation of the
Head of Organisation/ Institution /
Competent Authority

Note:

1. A certificate in the format prescribed should be obtained from the Head of the Organisation/ Institution wherein the individual had served or the authority competent to issue such certificate.
2. The competent authority who issues the certificate is cautioned that issuing of any certificate containing false details will lead to legal /penal action on them.

22. Experience Certificate for the post of Assistant Director Training / Principal, ITI in Employment and Training Department (Post Code: 1729)

1.	Name of the Employee	
2.	Father / Spouse Name	
3.	Date of Birth	
4.	Designation of the Employee	
5.	Nature of the Work / Duty performed by the Employee (To be mentioned in brief)	
6.	Whether the person possesses experience in a Workshop or Factory	Yes / No
7.	Period of Experience	From ____ (date) To ____ (date)
8.	Total Experience (YY/MM/DD)	____ years ____ months ____ days
9.	Whether Attendance Register / Attendance Rolls / Pay Register and other records available for this Employee	Yes / No
10.	Name of the Organisation/ Institution	
11.	Type of Organisation/ Institution / Firm (strikeout whichever is not applicable)	Workshop / Factory
12.	Factory Registration Number	
13.	Address of the Organisation/ Institution	
14.	Phone No. and Email ID of the Organisation/ Institution	

This is to certify that Thiru/Tmt./Selvi possesses said experience in a workshop or factory as on the date of notification (i.e., 07.05.2025). The above particulars furnished by me are correct.

Affix photograph of the employee with the signature of the Certifying Authority on the Photograph

Seal of Office / Officer:

Place
Date:

Signature
Name & Designation of the
Head of Organisation/ Institution /
Competent Authority

Note:

1. A certificate in the format prescribed should be obtained from the Head of the Organisation/ Institution wherein the individual had served or the authority competent to issue such certificate.
2. The competent authority who issues the certificate is cautioned that issuing of any certificate containing false details will lead to legal /penal action on them.

Explanation: A factory or workshop shall mean a factory as defined in Section 2(m) of the Factories Act, 1948 (Central Act 63 of 1948)

Annexure VI

Form for Certificate for Allocation of Scribe / Compensatory Time

This is to certify that I have examined Mr/Ms/Mrs. _____ (Name of the candidate with disability) a person with _____ (Nature and percentage of disability as mentioned in the certificate of disability), S/o/D/o _____ a resident of _____ (Village / District / State and to state that He / She has physical limitation which hampers his / her writing capabilities owing to his / her disability).

Due to the above mentioned disability following concession may be given:- *

1. Allocation of a scribe.
2. Compensatory time for writing the examination.

*strike out the non applicable.

Signature

(Name of Government Hospital / Civil Surgeon / Medical Superintendent / Signature of the notified Medical Authority of a Government Health Care Institution / Medical Board)

Name & Designation

Name of Government Hospital / Health Care Centre / The notified Medical Authority/ Medical Board

Place:

Date:

Signature / Thumb impression
of the Differently Abled Person

(Photo of the
Differently
Able Person
and Stamp to
be fixed here)

Note:

Certificate should be given by a specialist of the relevant stream / disability

(e.g. Visual Impairment – Ophthalmologist, Locomotor disability – Orthopedic Specialist / PMR etc.,)