



GOVERNMENT OF INDIA
Ministry of Electronics and Information Technology
National Informatics Centre

RECRUITMENT For Scientist – ‘B’ and Scientific/Technical Assistant – ‘A’
Vacancies to be filled up on direct recruitment basis
Detailed Advertisement (Advt No: NIELIT/NIC/2020/1)

1. **GENERAL:**

National Informatics Centre (NIC) was established in 1976, and has since emerged as a “prime builder” of e-Government / e-Governance applications up to the grassroots level as well as a promoter of digital opportunities for sustainable development. NIC has been instrumental in steering e-Government/e-Governance applications in government ministries/departments at the Centre, States and Districts, facilitating improvement in government services, wider transparency, promoting decentralized planning and management, resulting in better efficiency and accountability to the people of India. “Informatics-led-development” programme of the government has been spearheaded by NIC to derive competitive advantage by implementing ICT applications in social & public administration. The following major activities are being undertaken:

- Setting up of ICT Infrastructure
- Implementation of National and State Level e-Governance Projects/Products
- Consultancy to the Government departments
- Research & Development
- Capacity Building

National Institute of Electronics and Information Technology (NIELIT) invites applications, on behalf of Ministry of Electronics and Information Technology (MeitY), from eligible and qualified candidates for filling up of following Scientific & Technical Posts in **National Informatics Centre (NIC)**.

Sl. No	Designation	Total Vacant Posts	UR	Reserved for SC/ST/OBC/EWS				Reserved for PWDs (Horizontal Reservation)
				SC	ST	OBC (NCL)	EWS	
1	Scientist-‘B’ Group ‘A’ (S&T) Level-10: (Rs.56100- Rs.177500)	288	119	43	21	77	28	12 a. Locomotive disability (OA, OL, BL, OAL) – 04 b. Hard of Hearing (HH)- 04 c. Multiple Disabilities from amongst (a) to (b) except deaf-blindness - 04
2	Scientific/Technical Assistant - ‘A’ Group ‘B’ (S&T) Level-6 : (Rs.35400- Rs.112400)	207	86	31	15	55	20	9 a. Locomotive disability (OA, OL, BL, OAL) – 03 b. Hard of Hearing (HH)- 03 c. Multiple Disabilities from amongst (a) to (b) except deaf-blindness – 03

Note: The number of advertised posts are tentative, the actual number of posts may increase or decrease depending upon the requirement and the reservation for the posts shall be as per the policy of Government of India

2. **ELIGIBILITY CRITERIA:**

2.1 **ESSENTIAL EDUCATIONAL QUALIFICATION, EXPERIENCE etc.,**

a) EDUCATIONAL QUALIFICATION

1. **Scientist - 'B'**

A Pass in Bachelor Degree in Engineering **OR** Bachelor in Technology **OR** Department of Electronics and Accreditation of Computer Courses B-level **OR** Associate Member of Institute of Engineers **OR** Graduate Institute of Electronics and Telecommunication Engineers **OR** Master Degree in Science (MSc) **OR** Master Degree in Computer Application **OR** Master Degree in Engineering /Technology (ME /M.Tech) **OR** Master Degree in Philosophy (M Phil) in the field as mentioned below:-

Field (single or in combination amongst the below only):

Electronics, Electronics and Communication, Computer Sciences, Communication, Computer and Networking Security, Computer Application, Software System, Information Technology, Information Technology Management, Informatics, Computer Management, Cyber law, Electronics and Instrumentation.

2. **Scientific/Technical Assistant- 'A'**

A Pass in M.Sc./MS/MCA/B.E./B.Tech in any one or in combination of below mentioned field as mentioned below:-

Field (single or in combination amongst the below only):

Electronics, Electronics and Communication, Electronics & telecommunications, Computer Sciences, Computer and Networking Security, Software System, Information Technology, Informatics.

The candidate should have obtained the essential qualification on the date of closing of application (as on 26/03/2020)

b) EXPERIENCE: ***No Experience Required.***

2.2 AGE LIMIT (completed years as on 26/03/2020)

The upper age limit for direct recruitment for the category in post shall be as under:-

Category-wise Upper age limit not exceeding (in years)						
Posts	UR / EWS	SC/ST	OBC (NCL*)	PWD	# Service Candidate	Ex-Service men
Scientist - 'B' and Scientific/Technical Assistant – 'A'	30	35	33	40 [PWD SC/ST Candidates : 45; PWD OBC (NCL) candidates: 43]	35 [SC/ST Service Candidates: 40 ; OBC (NCL) Service Candidates: 38]	As per Govt. of India Rules

*NCL – Non Creamy Layer

#Provided that

- There shall be age relaxation for 5 years for candidates serving in Government Organizations working in post which are in the same line or allied cadres and where a relationship could be established that the service already rendered in a particular post will be useful for the efficient discharge of duties of the advertised post.
- The upper age limit in respect of SC, ST, OBC and PWD and other special categories of persons shall be relaxable in accordance with the orders issued by the Central Government from time to time in this regard.

- The age relaxation for SC/ST/OBC candidate is applicable for the post reserved for them. However relaxation in age limit for PWD candidate will be applicable irrespective of the fact whether the post is reserved for them or not, provided the post is identified suitable for them.

NOTE (Age calculation):

The crucial date for determining the age limit shall be closing date for **online** application submission.
i.e.,26/03/2020

3.0 PLACE OF POSTING:

The person selected may be posted **anywhere in India**.

4.0 HOW TO APPLY:

Before applying, candidates are advised to go through this advertisement carefully in detail for determining their eligibility as per laid down criteria for the post.

The admission at all the stages of the examination will be purely provisional subject to satisfying the prescribed eligibility conditions.

Candidates are requested to apply only by ONLINE at <https://www.calicut.nielit.in/nic/> between **26/02/2020 (10:00 A.M) &26/03/2020 (05:00 P.M)**. No other means/mode of application will be accepted. Candidates are required to have valid **e-mail** identification and active **mobile number**. The procedure/steps for filling up of applications online is briefed as under.

The complete Application can be submitted in **following 3 steps:**

STEP 1: Registration with Email id

STEP 2: Submission of Application details.

STEP 3: Payment of application fee online (*if applicable, see section 4.3 for details*)

The application shall be treated as complete only if all the three mandatory steps (Step 1, Step2 and Step 3 (if applicable)) are completed successfully. **In case, candidate is not able to submit fee by closing date and time, or the application is otherwise incomplete, his/her candidature will summarily be rejected and no further query or complaint will be entertained in this regard.**

Applicant can view the Application details from the ‘**View Application Option**’ available on the home page by logging at <https://www.calicut.nielit.in/nic/Login.aspx> with correct login credentials. Applicant is required to make sure that ‘Application Status’ on application form is “**Application Submission Completed Successfully and Application Fee received**” or “**Application Submission Completed Successfully and Application Fee not Applicable**” otherwise application will be treated as incomplete and summarily rejected **and no further query or complaint will be entertained in this regard.**

4.1 CHECKLIST:

Following should be kept handy before applying online

- a) Credit Card/Debit Card/Net Banking Details (If fee is applicable)
- b) Scanned image of Photograph along with signature (JPG format, size less than 50 KB) as per instruction in section 8.5.

- c) Scanned copies of Date of Birth Certificate, Certificate of Essential Educational Qualification, Photo ID, Caste Certificate (SC/ST/OBC) if applicable, Category Certificate (PWD or any other) if applicable, EWS Certificate if applicable, Certificate for seeking age relaxation, if applicable, NOC & Undertaking / Declaration if applicable – all in single file of pdf format (size less than 3 MB) only.

4.2 Choice of Centre of Written Examination:

Candidates shall indicate their choice of Centre for Written Examination from the cities listed below. No change of Centre will be permissible at a later date. NIELIT, however, reserves the right to direct the candidate to appear for Written Test at any location irrespective of his/her indicated choice depending upon the number of applications received and the administrative convenience.

(1) AGARTALA (2) AHMEDABAD (3) AIZAWL (4) BENGALURU (5) BHOPAL (6) BHUBANESWAR (7) CHANDIGARH (8) CHENNAI (9) DEHRADUN (10) DELHI (11) GANGTOK (12) GUWAHATI (13) HYDERABAD (14) IMPHAL (15) JAMMU (16) JAIPUR (17) KOHIMA (18) KOLKATA (19) LEH (20) LUCKNOW (21) MUMBAI (22) NAHARLAGUN (23) PATNA (24) PORT BLAIR (25) RAIPUR (26) RANCHI (27) THIRUVANANTHAPURAM (28) SHILLONG (29) VISAKHAPATNAM.

4.3 APPLICATION FEES:

The applicants shall pay the Application Fee (*non-refundable*) at the rates indicated in the table below through online payment mode via application software only:

CATEGORY	FEE
General and all others	<i>Rs.800/- per application per post (including taxes)</i>
SC/ST/ PWD/ Women candidates	Nil

The bank charges towards remittance of application fee if any, will have to be borne by the candidate. Fee through any other mode like Cash, Demand Draft, Pay Order, Cheque or Challan will **not** be accepted.

5. SELECTION PROCESS:

Selection will be done through a written examination and interview for Scientist 'B' Post and only through written examination for Scientific/Technical Assistant - 'A' Post.

All eligible candidates who have successfully submitted the online application for Scientist-'B' and Scientific/Technical Assistant – 'A' along with required fee & screened in, shall be called for a written examination. Written Examination shall be of 3 hours duration conducted in English medium only.

Scheme of written examination shall be Objective type and OMR Based.

The question paper for the written examination will consists of 65% questions from Technical Area and 35% from Generic Area. There shall be a total of 120 objective type Questions consisting of 78 questions from Technical Area (Computer Science) and 42 questions on Generic area.

The Generic Area will comprise of Logical Reasoning, Analytical Reasoning Capabilities, Quantitative and Qualitative abilities and General Aptitude.

Syllabus for Technical Area (Computer related topics: Computer Science/Computer Engineering) is given in Annexure 'A'

Every question will carry 1(one) mark and there will be negative marking of 0.25 mark for each wrong answer.

The minimum percentage to qualify the written examination will be 50% for General/EWS, 40% for OBC, 30% for the SC/ST/PWD categories. The cut –off marks specified would be applicable in the overall marks (i.e., Technical/Generic Combined) as well as for each section (Technical/Generic) separately.

Only the shortlisted candidates for the post of Scientist–'B' (based on merit position and reservation policy etc..) who have qualified the written examination, shall be called for interview.

The final selection of eligible candidates for appointment to the post of Scientist –'B' will be based on the combined performance of the candidates both in the written examination and in interview and verification of documents submitted by the candidates. The weight-age of marks for written examination and interview will be in the ratio 85:15. It is mandatory to appear in the interview for selection.

The final selection of eligible candidates for appointment to the post of Scientific/Technical Assistant – 'A' will be based on the merit position arrived from the performance of the candidates in the written examination, reservation policy and verification of documents submitted by the candidates.

5.1 VERIFICATION OF DOCUMENTS:

Verification of requisite documents will be done at the time of the interview for the post of Scientist- 'B'. Candidate will be interviewed only after verification of **original documents to ascertain their eligibility for the post.**

For Scientific/Technical Assistant - 'A', Verification of documents will be done before joining. Only short- listed candidates will be called for document verification.

Mere fulfilling of requirement as laid down in the advertisement does not qualify a candidate to be called for personal interaction/interview.

5.2 INTERVIEW: Shortlisted candidates shall be intimated about the date and venue through SMS/e-mail communications to the registered email ID/Mobile phone by NIELIT.

6. ACTION AGAINST MISCONDUCT:

Candidates are advised in their own interest that they should not furnish any particulars that are false, tampered or, fabricated and should not suppress any material information. A candidate is liable to be prosecuted for misconduct if during or at any stage of recruitment, he/she has been found guilty of:

- Using unfair means during the examination
- Impersonating or procuring impersonation by any person
- Misbehaving in the examination hall

- Resorting to any irregular means in connection with his/her candidature during selection process
- Obtaining support for his/her candidature by any means

Such candidates in addition to rendering himself/herself are liable to criminal prosecution and may also be liable to be:

- Disqualified from the examination hall
- Debarred either permanently or for a specified period from any examination/recruitment to be conducted by MeitY, its attached offices and statutory organizations.

7. IMPORTANT INFORMATION:

7.1 CITIZENSHIP

A Candidate must be either: (a) a citizen of India, or (b) a subject of Nepal, or (c) a subject of Bhutan, or (d) a Tibetan refugee who came over to India before 1st January, 1962 with the intention of permanently settling in India, or (e) a person of Indian origin who has migrated from Pakistan, Burma, Sri Lanka or East African countries of Kenya, Uganda, the United Republic of Tanzania (formerly Tanganyika and Zanzibar), Zambia, Malawi, Zaire, Ethiopia and Vietnam with the intention of permanently settling in India. Provided that a candidate belonging to categories (b), (c), (d) and (e) above shall be a person in whose favor a certificate of eligibility has been issued by the Government of India.

7.2 RESERVATION

- Reservation for SC/ST/OBC/EWS/PWD (minimum 40% disability) candidates shall be as per the Govt. guidelines. The candidates must upload a copy of the Caste/Category Certificate in the formats prescribed by Government of India. The Certificate for PWD must indicate the percentage of disability while the Certificate for Backward Caste must clearly indicate that the candidate does not belong to the persons/sections (Creamy Layer) mentioned in Column 3 of Schedule to the Government of India, Department of Personnel & Training O.M No 36012/22/93-Estt(SCT) dated 8/9/93 as amended from time to time (Performa for SC/ST/OBC/PWD etc., certificate are provided in Annexure 'B').
- The Benefit of reservation under EWS can be availed upon production of an Income and Asset Certificate issued by a Competent Authority as per DoPT OM No.36039/1/2019-Estt (Res) dated 31st January 2019. The income and Asset Certificate issued by any one of the following authorities in the prescribed format shall only be accepted as proof of candidate's claim as belonging to EWS.
 - District Magistrate/Additional District Magistrate/Collector/Deputy Commissioner/Additional Deputy Commissioner/1st Class Stipendiary Magistrate/Sub-Divisional Magistrate/Taluka Magistrate/Executive Magistrate/Extra Assistant Commissioner.
 - Chief Presidency Magistrate/Additional Chief Presidency Magistrate/Presidency Magistrate.
 - Revenue Officer not below the rank of Tehsildar.

(iv) Sub-Divisional Officer of the area where the candidate and /or his/her family normally resides.

7.3 CUT OFF DATE FOR AGE, QUALIFICATION AND EXPERIENCE

The Cutoff date for calculating the age as well as completion of eligibility conditions with regard to essential qualifications and experience, if applicable will be 26/03/2020 which will remain unchanged even in case of extension of the closing date for submission of applications.

7.4 CORRESPONDENCE

All correspondences in connection with the recruitment will be made by NIELIT / NIC through e-mails/SMS only on the registered e-mail ID and Mobile Number submitted by the candidate. The candidates must, therefore, regularly check their e-mail ID/SMS. Joining/Appointment process of selected candidates will also be made through the registered Email and Mobile with NIELIT, by NIC.

It is implicit that the candidate upon registration in the recruitment portal agrees to permit NIELIT to send Transactional SMS/e-mail communications to the registered email ID/Mobile phone.

The candidate must indicate his/her primary e-mail ID and active primary Mobile No., in the online application form on which the communication regarding this recruitment process would reach to the applicant. The candidate shall submit only one application against each post. Failure to do so may lead to rejection/cancellation of the Application.

7.5 APPLICATION FEE PAYMENT & ELIGIBILITY

NIELIT will not be responsible in case of incomplete transactions during the online payment process. It is the sole responsibility of the candidate to ensure that the correct payment of application fee has been made successfully. Application fee once paid is non-refundable.

Applicants, in their own interest, should check their eligibility for the post before remitting the application fee. Only qualifications mentioned against each post shall be considered for determining the eligibility.

8 IMPORTANT INSTRUCTIONS:

- 8.1 Applications which are not in conformity with the requirement indicated in the advertisement are liable to be rejected.
- 8.2 Candidates for the post of Scientist - 'B' at the time of interview shall bring the downloaded Interview Call Letter, self-attested copies of the testimonials along with their originals and NOC from their employer, if applicable, failing which they will not be allowed to appear in the interview.
- 8.3 Final Selection of candidates for appointment to the above mentioned positions will be based on meeting the prescribed eligibility criteria, the performance in the written examination and in interview (if applicable).
- 8.4 If at any point of time it is found that the information furnished by the candidate was incorrect in any respect or forged /fabricated documents were presented by any candidate, his/her candidature will be cancelled and in case the candidate has already joined the post, his services shall be summarily terminated.

- 8.5 Each candidate shall affix his/her recent color passport size photograph (of size 3.5 cms x 4.5 cms) on a White Paper and then append his/her signatures with Black Pen in another box of 3.5 cms x 1.5cms below the photograph on the same Paper.(sample at Annexure 'C') Scan the above photo and signature in a single file in JPG format of size not more than 50 KB, and resolution of 170px(width) X 250px(height). Upload the same at appropriate space provided in the on-line Application Form.
- 8.6 Candidate shall upload only the following relevant document (first three are mandatory for all candidate) in the following sequence in a single file in PDF Format (not exceeding the size of 3 MB):
- Certificate of Date of Birth (issued by Municipality etc or Matriculation/High School/SSC Certificate)
 - Certificates of Educational qualification, which makes him/her eligible for applying for the post.
 - Photo id proof
 - Certificates of Higher Educational qualification, **if any**
 - Caste certificate (SC/ST/OBC(NCL)), **if applicable**
 - Category Certificate (PWD or any other), **if applicable**
 - EWS Certificate, **if applicable**
 - Certificate for seeking age relaxation, **if applicable**
 - NOC with Undertaking /Declaration, **if applicable**
- 8.7 The candidates should upload only relevant documents. It should be kept in view that **uploading of irrelevant documents may lead to disqualification of the candidature/rejection of the application Form.** Non-submission of the documents in the above sequence may lead to cancellation/rejection of the Application Form.
- 8.8 Candidates shall have eligibility qualification complete in all respects by closing date. Qualifications obtained through Open Universities/Distance Education mode that are approved by DEC and wherever necessary, by AICTE, are recognized for the purpose of employment under Central Government vide Gazette Notification No. 44 dated 1st March 1995 alone shall be considered as eligible.
- 8.9 **Before final submission of the on-line Application Form, the candidates must go through the same carefully. It shall be noted that Incomplete / Incorrect application form will be summarily rejected.**
- 8.10 After submitting the ONLINE Application Form, the candidate should take the printout of 'View Application' bearing the candidate id, which should be referred to in all future correspondence with NIELIT in connection with this recruitment process.
- 8.11 Candidates applying for the posts of Scientist - 'B' or Scientific/Technical Assistant – 'A', working with Central Govt./ State Govt./PSU/Autonomous bodies have to furnish 'NOC' from the authority concerned. The 'NOC' should also confirm that no disciplinary/vigilance case is either pending or contemplated. Scientist - 'B' Candidate should produce the 'NOC' at the time of interview. Scientific/Technical Assistant – 'A', candidate should produce the 'NOC' before joining.
- 8.12 Withdrawal of candidature on account of non-furnishing of any information will not confer any right to carry forward or retain the candidature for future recruitment.

- 8.13 Any request for change of address will not be entertained. Also no change in particulars shall be permitted and the particulars furnished by the applicant in the online application form will be taken as final.
- 8.14 **No TA/DA shall be paid for attending the written exam and interview.**
- 8.15 **Candidate must ensure that the information provided in the application portal are correct and final. Correction/addition of any information already submitted is not allowed during later phases of recruitment process.**
- 8.16 For any problems related to online submission of application form/downloading of admit card, please send e-mail to recruit@nielit.gov.in mentioning advertisement number in the subject. No other query will be entertained at this mail-id.

Annexure A
Syllabus for Scientist B

Total Duration : 3 Hours.		No of Questions : 120
Sl.No	Topic	
Section A : Generic 35%		
1	Logical Reasoning, Analytical Reasoning Capabilities, Quantitative and Qualitative abilities, General Aptitude.	
Section B : Technical (Computer Science) 65%		
1	Probability, Statistics and Combinatorics: Conditional Probability; Mean, Median, Mode and Standard Deviation; Random Variables; Distributions; uniforms, normal, Exponential, Poisson, Binomial, Permutations, Combinations, Counting, Summation, generating functions, recurrence relations, asymptotic.	
2	Digital Logic: Logic functions, Minimization, Design and synthesis of combinational and sequential circuits, Number representation and computer arithmetic (fixed and floating point).	
3	Computer Organization and Architecture: Machine instructions and addressing modes, ALU and data-path, CPU control design, Memory interface, I/O interface (interrupt and DMA mode), instruction pipelining, Cache and main memory, Secondary storage.	
4	Electrical Engineering: Power Electronics, Signals and Systems, Electromagnetic Fields, Network graph, KCL, KVL, Node and Mesh Analysis, Transient response of DC and AC Networks, Sinusoidal steady-state analysis, Resonance, Super position theorem, Maximum Power transfer theorem, Three Phase Circuits, Power and Power factor in AC Circuits.	
5	Analog and Digital Communication: Autocorrelation and power spectral density, properties of white noise, filtering of random signals through LTI systems, amplitude modulation and demodulation, angle modulation and demodulation, spectra of AM and FM, Super heterodyne receivers, circuits for analog communications, information theory, entropy, mutual information and channel capacity theorem, Digital communications, PCM, DPCM, digital modulation schemes, amplitude, phase and frequency shift keying (ASK, PSK, FSK), QAM, MAP and ML decoding, matched filter receiver, calculation of bandwidth, SNR and BER for digital modulation; Fundamentals of error correction, Hamming codes; Timing and frequency synchronization, inter-symbol interference and its mitigation; Basics of TDMA, FDMA and CDMA.	
6	Programming and Data Structures: Programming in modern languages viz., Java, .Net, Open Source (PHP), Python, GoLang, NodeJS, etc. Functions, Recursion, Parameter passing, Scope, Binding, Abstract data types Arrays, Stacks, Queues, Linked Lists, Trees, Binary search trees, Binary heaps, Object Oriented Programming Concepts- Object, Class, inheritance, Polymorphism, Abstraction and Encapsulation.	
7	Algorithms: Analysis, Asymptotic, notation, Notions of space and time complexity, Worst and average case analysis, Design; Greedy approach, Dynamic programming, Divide-and-conquer, Tree and graph traversals, Connected competent, Spanning trees, Shortest paths; Hashing, Sorting, Searching, Asymptotic analysis (best, worst, average cases) of time and space, upper and lower bounds, Basic concept of complexity classes-P, NP, NP-hard, NP-complete.	
8	Compiler Design: Lexical analysis, Parsing, Syntax directed translation, Runtime environments, intermediate and target code generation, Basics of code optimization.	

9	Operating System: Processes, Threads, Inter-Process communication, Concurrency, Synchronization, Deadlock, CPU scheduling, Memory management and virtual memory, File systems, I/O systems, Protection and security.
10	Databases: ER-model, Relational Model (relational algebra, tuple calculus), Database design (integrity constraints, normal forms), Query languages (SQL), File structures (sequential files, indexing, B and B+ trees), Transactions and concurrency control, NoSQL Databases, questions on internals of Postgres SQL.
11	Information Systems and Software Engineering: Information gathering, requirement and feasibility analysis, data flow diagrams, process specifications, input/output design, process life cycle, planning and managing the project, design, coding, testing, Implementation, maintenance.
12	Computer Networks: ISO/OSI stack, LAN technologies, Flow and error control techniques, Routing algorithms, Congestion control, TCP/UDP and sockets, IP(v4), IP(v6), Application layer protocols, (ICMP, DNS, SMTP, POP, FTP, HTTP, HTTPS), Basic concepts of hubs, switches, gateways and routers. Wireless technologies, Network security -basic concepts of public key and private key cryptography, digital signature, firewalls.
13	Web Technologies: HTML5, CSS3, XML, basic concept of client-server computing, web server, proxy server, web application development, MVC Architecture, web services, frontend technologies.
14	Cyber Security and Emerging Technologies: Secure programming techniques, OWASP top 10 vulnerabilities, concepts on IOT, Block chain, AI etc..
15	Cloud Technology: Compute, Network, Storage Management Technologies, Edge Computing etc.

Syllabus for Scientific/Technical Assistant -A

Total Duration : 3 Hours.		No of Questions: 120
Sl. No	Topic	
Section A : Generic 35%		
1	Logical Reasoning, Analytical Reasoning Capabilities, Quantitative and Qualitative abilities and General Aptitude.	
Section B : Technical (Computer Science) 65%		
1	Probability and Statistics: Sampling theorems, Conditional Probability, Mean, Median, Mode and standard deviations, Random Variables discrete and continuous distributions, Poisson, Normal and Binomial distribution, correlation and regression analysis.	
2	Digital Computer Principles: Number systems- Binary, Decimal, Octal, and Hexadecimal Conversion, Arithmetic operations, Boolean expression, simplification, Postulates and theorems, Simplifications, K-map, Combinational Logic circuits – Adder, Subtractor, Multiplexer, Demultiplexer, Encoder, Decoder, Sequential circuits – SR, JK, T, D, flip flops, shift registers, Asynchronous, synchronous and Module and counters.	
3	Computer Organization and Architecture: Multiprocessors and microcomputers, Machine Instructions and addressing mode. ALU and data-path, CPU control design, Memory interface, I/O interface (Interrupt and DMA mode), Cache and main memory, Secondary storage, Semiconductor memory – Internal organization, SRAM, DRAM, SDRAM, Rambus Memory, ROM Technology, virtual memory, Instruction sequencing, Instruction execution, Hardwired control and microprogrammed control, micro instructions, Instruction pipelining.	
4	Programming and Data Structures : Programming in C, Functions , Recursion, Parameter passing, Scope, Binding; Abstract data types, Arrays, Stacks, Queues, Linked Lists, Trees, Binary search trees, Binary heaps.	
5	Object Oriented Programming: Object Oriented design concept, programming in C++ and on programming languages viz., Java, .Net , Open Source (PHP), Python, GoLang, NodeJS, etc	
6	Algorithms: Analysis, Asymptotic notation, Notions of space and time complexity, Worst and average case analysis, Design; Greedy approach, Dynamic programming, Divide and conquer; Tree and graph traversals, Connected Components, Spanning trees, Shortest paths, Hashing, Sorting, Searching. Asymptotic analysis (best, worst, average cases) of time and space, upper and lower bounds. Basic concept of complexity classes, N, NP, NP-hard, NP-complete.	
7	Databases: ER-model, Relational model (relational algebra, tuple calculus), Database design (integrity constraints, normal forms), Query languages (SQL), File structures (sequential files, indexing, B and B+ trees), Transactions and concurrency control.	
8	System Software: Lexical analysis, parsing, syntax directed translation, code generation and optimization, Assemblers, linkers and loaders for microprocessors, operating systems - processes, threads, inter-process communication, synchronization, deadlocks, CPU scheduling, memory management and virtual memory , file system, I/O systems, protection and security module.	
9	Information Systems and Software Engineering: Information gathering, requirement and feasibility analysis, data flow diagrams, process specifications, input/output design, process life cycle, planning and	

	managing the project, design, coding and testing, implementation, maintenance.
10	<p>Computer Networks: ISO/OSI stack, LAN technologies (Ethernet, Token Ring), flow and error control techniques, Routing algorithm, Congestion Control, TCP/UDP and sockets, IP(v4), Application layer protocol (ICMP, DNS,SMTP, POP, FTP, HTTP, HTTPS) : Basic concept of hubs, switches, gateways and routers.</p> <p>Network security: basic concepts of public key and private key cryptography. Hash function, Digital Signature, Firewalls, User authentication - Token based, Biometric, Remote user authentication, Intrusion detection systems, honey pots, Denial of Service.</p> <p>Wireless network, 2G and 3G Networks, Bluetooth.</p>
11	<p>Web Technologies: HTML5, CSS3, XML, basic concept of client-server computing, web server, proxy server, web application development, MVC architecture, web services, frontend and backend technologies.</p>

ANNEXURE B

(Click the links to open the corresponding Performa)

1. [Performa –I](#) - The form of certificate to be produced by Scheduled Castes and Scheduled Tribes Candidates applying for appointment to Posts under the Government of India.
2. [Performa –II](#) - The form of certificate to be produced by Other Backward Classes Applying for Appointment to Posts under the Government of India.
3. [Performa –III](#) - The form of certificate to be produced by Economically Weaker Sections
4. [Performa –IV](#) - The form of certificate to be produced by PWD Candidates
5. [Performa –V](#) - The form of certificate to be produced by Government servants for claiming Age concession and Declaration regarding intimation to Cadre Controlling Authority

