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National Informatics Centre

Ministry of Electronics and Information Technology

GOVERNMENT OF INDIA

RECRUITMENT *For Scientific and Technical Posts*

Vacancies to be filled up on direct recruitment basis

Detailed Advertisement*(Advt No: NIELIT/NIC/2023/1)*

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, Districts and Blocks, facilitating improvement in government services, wider transparency, promoting decentralized planning and Centre, States, Districts and Blocks, 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' (*Gazetted*) Level-10 (Rs. 56100- Rs.177500)**	**71**	**30**	**10**	**5**	**19**	**7**	**3** a. Locomotive disability (OA, OL, BL, OAL) – **1** b. Hard of Hearing (HH)- **1** c. Multiple Disabilities from amongst (a) to (b) except deaf-blindness - **1**
2	**Scientific Officer/Engineer – SB** **Group-B (Gazetted) Level-7 (Rs. 44900- Rs.142400)**	**196**	**81**	**29**	**14**	**52**	**20**	**8** a. Locomotive disability (OA, OL, BL, OAL) – **3** b. Hard of Hearing (HH)- **3** c. Multiple Disabilities from amongst (a) to (b) except deaf-blindness - **2**
3	**Scientific/Technical Assistant - 'A'** **Group-B (Non-Gazetted) Level-6 (Rs. 35400- Rs.112400)**	**331**	**134**	**50**	**24**	**91**	**32**	**14** a. Locomotive disability (OA, OL, BL, OAL) – **5** b. Hard of Hearing (HH)- **5** c. Multiple Disabilities from amongst (a) to (b) except deaf-blindness - **4**

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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. For 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. For Scientific Officer / Engineer-SB and 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 ***04/04/2023***)

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

2.2 AGE LIMIT *(completed years as on* **04/04/2023***)*

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', Scientific Officer / Engineer-SB and Scientific/Technical Assistant-A	30	35	33	40 {*SC/ST PWD Candidates : 45; OBC (NCL) PWD candidate 43}*	UR/EWS Service Candidate : 35 ; SC/ST Service Candidate : 40 ; OBC (NCL) Service Candidate : 38	As per Govt. 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.

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- 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. **04/04/2023**

3.0 PLACE OF POSTING:

The person selected may be posted **anywhere in India and outside India** in the interest of the Organization.

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 candidate shall submit only one application against each post. Failure to do so may lead to rejection/cancellation of the Application.

The admission at all the stages of the recruitment 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/nic23** between **04/03/2023 (10:00 a.m) & 04/04/2023 (5:30 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"** option available on the home page by logging at **https://www.calicut.nielit.in/nic23** 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

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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 Banking Details (if fee is applicable),
b) Scanned image of Photograph along with signature (JPEG/JPG format, size less than 50 KB) as per instruction in section 8.5,
c) Scanned copies of Essential Educational Qualification, i.e., Matriculation certificate, Higher Secondary certificate and Degree certificate along with consolidated marks-list, date of birth certificate, category certificate, i.e. SC/ST/OBC/EWS/PWD (if applicable), Experience certificate (if applicable), NOC (if applicable) 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) Itanagar (16) Jaipur (17) Jammu (18) Kochi (19) Kohima (20) Kolkata (21) Lucknow (22) Mumbai (23) Patna (24) Raipur (25) Ranchi (26) Shillong (27) Shimla (28) Port-Blair (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	SC/ST/ PWD/ Women candidates	General and all others
FEE	Nil	***Rs.800/-*** *per application per post (including taxes)*

Candidates who are applying ***for more than one post*** needs to pay Rs 800/- (including taxes) for every post.
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.

Note: Application fee once paid will not be refunded.

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5. SELECTION PROCESS:

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

The written examination will be in ONLINE mode and the question paper would consist of 120 nos. of Multiple Choice Questions (MCQs) to be answered in a maximum time of 3 hours. The medium of written examination shall be in English only.

The question paper will consists of 65% questions from Technical Area and 35% questions from Generic Area. (Syllabus Attached as 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.

For Scientist-B & Scientific Officer/Engineer-SB

Only the shortlisted candidates (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 will be based on the combined performance of the candidates both in the written examination and in interview. 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.

For Scientific/Technical Assistant-A

The final selection of eligible candidates for appointment will be based on the merit position (based on the reservation policy) arrived from the performance of the candidates in the written examination.

Online Examination

The Examination will be conducted only in online mode and if more candidates are there, the examination will be conducted in multiple batches/sessions. In such cases normalization will be followed among batches. In the event of any technical lapses, re-examination will be conducted at effected examination centers or for effected candidates only as the case may be as per the broad scheme given below:

a) In case of any minor technical glitches like system breakdown for a specific period of time, then the timer will be reset and will start from the time it stopped. No retest will be conducted – only extended time will be allotted and allowed to the affected candidates.

b) However, if major fault occurred in a particular centre and more than 70% of the candidates scheduled in that particular centre could not take the exam then examination at that centre will be cancelled. Retest for candidates of that centre only will be scheduled on a new date with a

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new question paper. In this case the candidates will not be charged any additional fee for retest. However, affected candidates should make their own arrangements for appearing for retest on the specified new date(s). Also, if any of the candidate fails to attend the retest for any reason, no retest shall be held under any circumstance for that candidate.

c) The final result will be based on and calculated as per the scheme of normalization (formula) given below:

$$\widehat{M}_{ij} = \frac{\bar{M}_t^g - M_q^g}{\bar{M}_{ti} - M_{iq}} \left(M_{ij} - M_{iq}\right) + M_q^{gm}$$

Where:

$\widehat{M}_{ij}$ = Normalized marks of j^{th} candidate in the i^{th} shift.

$\bar{M}_t^g$= is the average marks of the top 0.1% of the candidates considering all shifts (number of candidates will be rounded-up).

M_q^g= is the sum of mean and standard deviation marks of the candidates in the examination considering all shifts.

$\bar{M}_{ti}$= is the average marks of the top 0.1% of the candidates in the i^{th} shift (number of candidates will be rounded-up).

M_{iq}= is the sum of mean marks and standard deviation of the i^{th} shift.

M_{ij}= is the actual marks obtained by the j^{th} candidate in i^{th} shift.

M_q^{gm}= is the sum of mean marks of candidates in the shift having maximum mean and standard deviation of marks of candidates in the examination considering all shifts.

5.1 VERIFICATION OF DOCUMENTS:

For **Scientist-B & Scientific Officer/Engineer-SB** posts**,** verification of requisite documents will be done at the time of the interview. Candidate will be interviewed only after production of **original documents** for verification.

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

For **Scientific/Technical Assistant – A** post, verification of documents will be done before joining.

Only short-listed candidates will be called for document verification.

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.

Interviews shall be conducted at Delhi or at any other location /mode approved by competent authority.

No request for postponement or change in location is allowed/entertained.

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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:

a) Disqualified from the examination hall
b) 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

a) 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 (Proforma for SC/ST/OBC/PWD etc certificate are provided in Annexure “B”).

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

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shall only be accepted as proof of candidate's claim as belonging to EWS. (Annexure "C")

(i) 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.

(ii) Chief Presidency Magistrate/Additional Chief Presidency Magistrate/ Presidency Magistrate.

(iii) 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 Cut-off date for calculating the age as well as completion of eligibility conditions with regard to essential qualifications and experience (if applicable) will be **04/04/2023** 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 no. submitted by the candidate. The candidates must, therefore indicate his/her primary email ID an active primary mobile number in the online application form on which the communication regarding this recruitment process would reach to the applicant. Joining/Appointment process of selected candidates will also be made through the registered Email and Mobile with NIELIT, by NIC. Hence the candidate must regularly check their emails/SMS.

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.

After declaration of result, candidates are required to regularly check the recruitment website of NIC (https://recruitment.nic.in/) for further course of action.

Note: Disclaimer : In case of failure of candidate(s) to respond to NIC/NIELIT communication(s) online as above, during recruitment process, resulting in rejection of candidature, NIC/NIELIT shall not be responsible.

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.

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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' & Scientific Officer/Engineer 'SB' 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 canceled 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 colour passport size photograph (of size 3.5 cms x 4.5 cms) in JPG format of size not more than 50 KB and upload the same at appropriate space provided in the on-line Application Form.

8.6 Each candidate shall also affix his/her signatures with Black/Blue Pen in a white paper and scan them to a JPG file (of dimension 3.5 cms x 1.5 cms) with size not more than 20 KB and upload the same at appropriate space provided in the on-line Application Form.

8.7 Candidate shall upload only the following relevant document 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.
- 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**
- Experience Certificates, **if applicable**
- NOC/Declaration, **if applicable**

8.8 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.

8.9 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

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of employment under Central Government vide Gazette Notification No. 44 dated 1st March 1995 alone shall be considered as eligible.

8.10 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.

8.11 After submitting the ONLINE Application Form, the candidates are advised to download the application form and the Application id should be referred to in all future correspondence with NIELIT in connection with this recruitment process.

8.12 Candidates 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. 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 For any problems related to online submission of application form/downloading of admit card, please send e-mail to **recruits@nielit.gov.in** mentioning advertisement number in the subject. No other query will be entertained at this mail-id.

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Syllabus for Recruitment Exam for the Post of Scientist-'B'

Total Duration: 3 Hours | No. of Questions: 120

S. No	Topic
	Section A: Generic
1.	Logical Reasoning, Analytical Reasoning Capabilities, Quantitative and Qualitative Abilities, General Aptitude
	Section B: Technical (Computer Science)
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, question on internals of Postgres SQL

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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), 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.

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Syllabus for Recruitment Exam for the Post of
Scientific Officer / Engineer-SB and 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, 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, Encode, 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 tress, 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 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.	**Computer Networks:** IOS/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. 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. Wireless network, 2G and 3G Networks, Bluetooth.
11.	**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.

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Annexure-B

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

This is to certify that Shri/Shrimati/Kumari*..... son/daughter* of ..... of village/town* ..... in District/Division* ..... of the State/Union Territory* ..... belongs to the..... caste/tribe* which is recognised as a Scheduled Caste/Scheduled Tribe* under:—

@ The Constitution (Scheduled Castes) Order, 1950
@ The Constitution (Scheduled Tribes) Order, 1950
@ The Constitution (Scheduled Castes) Union Territories Order, 1951
@ The Constitution (Scheduled Tribes) Union Territories Order, 1951

[as amended by the Scheduled Castes and Scheduled Tribes List (Modification) Order, 1956; the Bombay Reorganisation Act, 1960, the Punjab Reorganisation Act, 1966, the State of Himachal Pradesh Act, 1970, the North Eastern Areas (Reorganisation) Act, 1971, the Scheduled Castes and Scheduled Tribes Order (Amendment) Act, 1976., the State of Mizoram Act, 1986, the State of Arunachal Pradesh Act, 1986 and the Goa, Daman and Diu (Reorganisation) Act, 1987.]

@ The Constitution (Jammu and Kashmir) Scheduled Castes Order, 1956
@ The Constitution (Andaman and Nicobar Islands) Scheduled Tribes Order, 1959 as amended by the Scheduled Castes and Scheduled Tribes Order (Amendment) Act, 1976
@ The Constitution (Dadar and Nagar Haveli) Scheduled Castes Order, 1962
@ The Constitution (Dadar and Nagar Haveli) Scheduled Tribes Order, 1962
@ The Constitution (Pondicherry) Scheduled Castes Order, 1964
@ The Constitution (Uttar Pradesh) Scheduled Tribes Order, 1967
@ The Constitution (Goa, Daman and Diu) Scheduled Castes Order, 1968
@ The Constitution (Goa, Daman and Diu) Scheduled Tribes Order, 1968
@ The Constitution (Nagaland) Scheduled Tribes Order, 1970
@ The Constitution (Sikkim) Scheduled Castes Order, 1978
@ The Constitution (Sikkim) Scheduled Tribes Order, 1978
@ The Constitution (Jammu & Kashmir) Scheduled Tribes Order, 1989
@ The Constitution (SC) Order (Amendment) Act, 1990
@ The Constitution (ST) Order (Amendment) Act, 1991
@ The Constitution (ST) Order (Second Amendment) Act, 1991
@ The Scheduled Castes and Scheduled Tribes Orders (Amendment) Act 2002
@ The Constitution (Scheduled Castes) Order (Amendment) Act, 2002
@ The Constitution (Scheduled Castes and Scheduled Tribes) Orders (Amendment) Act, 2002
@ The Constitution (Scheduled Castes) Orders (Second Amendment) Act, 2002

% 2. Applicable in the case of Scheduled Castes/Scheduled Tribes persons who have migrated from one State/Union Territory Administration to another.

This certificate is issued on the basis of the Scheduled Castes/Scheduled Tribes certificate issued to Shri/Shrimati*..... Father/Mother of Shri/Shrimati/Kumari ..... of village/town* ..... in District/Division*..... of the State/Union Territory*..... who belongs to the caste/tribe* which is recognised as a Scheduled Caste/Scheduled Tribe in the State/Union Territory* of ..... issued by the ..... dated .....

% 3. Shri/Shrimati/Kumari*..... and/or* his/her* family ordinarily resides in village/town*..... of..... District/Division* of the State/Union Territory* of.....

Signature.....
**Designation.....

(With Seal of Office)
State/Union Territory*

Place: .....
Date: .....

*Please delete the words which are not applicable.
@Please quote specific Presidential Order.
% Delete the paragraph which is not applicable.

NOTE: The term "ordinarily reside (s)" used here will have the same meaning as in Section 20 of the Representation of the People Act, 1950.

**List of authorities empowered to issue Scheduled Caste/Scheduled Tribe Certificate.

(i) District Magistrate/Additional District Magistrate/Collector/Deputy Commissioner/Additional Deputy Commissioner/Deputy Collector/1st Class Stipendiary Magistrate/† Sub-Divisional Magistrate/Taluka Magistrate/Executive Magistrate/Extra Assistant Commissioner.
†(not below of the rank of 1st Class Stipendiary Magistrate).
(ii) Chief Presidency Magistrate/Additional Chief Presidency Magistrate/Presidency Magistrate.
(iii) Revenue Officers not below the rank of Tehsildar.
(iv) Sub Divisional Officer of the area where the candidate and/or his/her family normally resides.
(v) Administrator/Secretary to Administrator/Development Officer(Lakshadweep)

Performa II

FORM OF CERTIFICATE TO BE PRODUCED BY OTHER BACKWARD CLASSES APPLYING FOR APPOINTMENT TO POSTS UNDER THE GOVERNMENT OF INDIA

This is to certify that Shri/Smt./Kumari _____son/daughter of _____ of village/town _____ in District/Division _____ in the State/Union Territory _____ belongs to the _____ community which is recognised as a backward class under the Government of India, Ministry of Social Justice and Empowerment's Resolution No. _____ dated _____*. Shri/Smt./Kumari _____ and /or his/her family ordinarily reside(s) in the _____ District/Division of the _____ State/Union Territory. This is also to certify that he/she does not belong to the persons/sections (Creamy Layer) mentioned in Column 3 of the Schedule to the Government of India, Department of Personnel & Training O.M. No. 36012/22/93-Estt. (SCT) dated 8.9.1993**.

District Magistrate
Deputy Commissioner etc.

Dated:

Seal

---

*- The authority issuing the certificate may have to mention the details of Resolution of Government of India, in which the caste of the candidate is mentioned as OBC.

**- As amended from time to time.

Note:- The term "Ordinarily" used here will have the same meaning as in Section 20 of the Representation of the People Act, 1950.

Performa IV

Certificate of Disability

(In cases of amputation or complete permanent paralysis of limbs and in cases of blindness)

[See rule 18(1)]

(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 .....

(A) 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 Authorised Signatory of notified Medical Authority)

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

Performa IV

Certificate of Disability
(In case of multiple disabilities)

[See rule 18(1)]

(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 are 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 shown against the relevant disability in the table below:

S. 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.

Performa IV

Certificate of Disability

(In cases other than those mentioned in Forms V and VI)

(NAME AND ADDRESS OF THE MEDICAL AUTHORITY ISSUING THE CERTIFICATE)

[See rule 18(1)]

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 (to be specified) and is shown against the relevant disability in the table below:-

S. 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

(Authorised 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.

Note: In case this certificate is issued by a medical authority who is not a government servant, it shall be valid only if countersigned by the Chief Medical Officer of the District.

Note: The principal rules were published in the Gazette of India by Ministry of Social Justice and Empowerment vide notification number 489, dated 15.06.2017.

Performa - III

Government of.....

(Name & Address of the authority issuing the certificate)

INCOME & ASSEST CERTIFICATE TO BE PRODUCED BY ECONOMICALLY WEAKER SECTIONS

Certificate No..... Date:.....

VALID FOR THE YEAR .....

This is to certify that Shri/Smt./Kumari ..... son/daughter/wife of ..... permanent resident of, ... Village/Street, ... Post Office, ...District..... in the State/Union Territory..... Pin Code.....whose photograph is attested below belongs to Economically Weaker Sections, since the gross annual income* of his/her family** is below Rs. 8 lakh (Rupees Eight Lakh only) for the financial year ..... His/her family does not own or possess any of the following assets*** :

I. 5 acres of agricultural land and above;
II. Residential flat of 1000 sq. ft. and above;
III. Residential plot of 100 sq. yards and above in notified municipalities;
IV. Residential plot of 200 sq. yards and above in. areas other than the notified municipalities.

2. Shri/Smt./Kumari ..... belongs to the ..... caste which is not recognized as a Scheduled Caste, Scheduled Tribe and Other Backward Classes (Central List).

Signature with seal of Office.....
Name.....
Designation.....

Recent passport size attested photograph of the applicant

***Note 1:** Income covered all sources i.e. salary, agriculture, business, profession, etc.

****Note 2:** The term '**Family**" for this purpose include the person, who seeks benefit of reservation, his/her parents and siblings below the age of 18 years as also his/her spouse and children below the age of 18 years

*****Note 3:** The property held by a "Family' in different locations or different places/cities have been clubbed while applying the land or property holding test to determine EWS status.

****