

NATIONAL INSTITUTE OF PHARMACEUTICAL EDUCATION AND RESEARCH, RAEBARELI

(An Autonomous Institute under Department of Pharmaceuticals, Ministry of Chemicals and Fertilizers, Government of India)

Transit Campus of NIPER Raebareli, Bijnor - Sisendi Road, PO- Mati, Sarojini Nagar, Lucknow (UP) - 226002

Phone: 0522-2497903 Web: www.niperraebareli.edu.in

**Syllabus For Non Teaching Post**

The Institute vide its Advertisement No. NIPER-R/Recruit/01/2019-20 dated 17th August, 2020 advertised various Non-Teaching Positions to be filled on direct recruitment basis.

With reference to above, the information related to Pattern of Written Examination, Syllabus, Total Marks, etc. for various Non-Teaching Positions is given below for information of all concerned.

**NAME OF THE POST: Technical Assistant (Computer)**

Written Examination shall consist Two Objective Type Papers each comprising 100 Multiple Choice Questions (MCQs) as detailed below:

Paper	Subject	Number of Questions	Maximum Marks	Duration
Paper I	General English, Numerical Aptitude, Reasoning and General Knowledge	30	30	2 hrs
Paper II	Domain Knowledge As per Syllabus	70	70	

In addition to the above written test, the candidates for the post of Technical Assistant (Computer) shall have to appear in the Skill Test as detailed below:

Name of the Skill Test	Duration	Maximum Marks
Skill Test	60 Minutes	25

**Syllabus for the post of Technical Assistant (Computer):**

**Paper-I**

General Awareness

- Indian Constitution, Indian Economy, Culture, Indian Polity, Abbreviations, Personalities in News, Science & Technology, India Geography, History, Awards & Honors, Important Financial & Economic News, General Politics, Books & Authors, Inventions & Discoveries Science, Important Days, Sports & Games, Current Events

General English

- Grammar, Articles, Fill in the Blanks, Error Correction, Comprehension, Sentence Rearrangement, Synonyms, Vocabulary, Antonyms, Verbs, Tenses, Adverbs, Unseen Passages, Idioms & Phrases, Subject-Verb Agreement

Numerical Ability

- Ages Problems, Number Systems, Time & Distance, Percentages, Pipes & Cisterns, Averages, Data Interpretation, Boats & Streams, Time & Work, Discounts, Mixture and Allegation, Ratio & Proportion, Profit & Loss, H.C.F. & L.C.M, Simple & Compound Interest

Reasoning

- Arithmetical Reasoning, Embedded Figures, Cubes & Dice, Coding-Decoding, Alphabet Series, Number Series, Number Ranking, Mirror Images, Non-Verbal Series, Clocks & Calendars, Decision Making, Blood Relations, Directions, Analogy

**General English:** Questions in this component will be designed to test the Candidate's understanding and knowledge of English Language like Error recognition, Fill in the blanks (using verbs, preposition, articles etc.), One word substitution, Improvement of Sentences, Vocabulary, Spellings, Grammar, Sentence Structure, Synonyms, Antonyms, Sentence Completion, Phrases and Idiomatic use of words, Comprehension of Passages, as may be expected of a well-educated person who has not made a special study of the subject.

**Numerical Aptitude & Reasoning:** The questions will be designed to test the ability of appropriate use of numbers and number sense of the candidate. The scope of the test will be the computation of whole numbers, decimals and fractions and relationships between numbers. It will test sense of order among numbers, ability to translate form one name to another, sense or order of magnitude, estimation or prediction of the outcome of computation, selection of an appropriate operation for the solution of real life problems and knowledge of alternative computation procedures to find answers. The questions would also be based on arithmetical concepts and relationship between numbers and not on complicated arithmetical computation. On general reasoning, the candidates will be tested on reasoning and analytical abilities.

**General Knowledge:** Questions will be designed to General Knowledge viz., General Science, current events of national and international importance, History of India and Indian National Movement, India and World Geography, Indian Polity & Economy, General Mental Ability, NIPER Act & Statutes, Indian States, India and other countries.

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**Paper-II**

Digital Logic: Logic functions, Minimization, Design and synthesis of combinational and sequential circuits. Number representation and computer arithmetic (fixed and floating-point), Number System.

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.

Data representation: signed number representation, fixed and floating point representations, character representation. Computer arithmetic - integer addition and subtraction, ripple carry adder, carry look-ahead adder, etc. multiplication - shift-and-add, Booth multiplier, carry save multiplier, etc. Division - non-restoring and restoring techniques, floating point arithmetic.

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. Superheterodyne 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.

Programming and Data Structures: Programming in modern languages viz., C#, ASP.Net, VB.Net, Open Source (PHP), etc. Functions, Recursion, Parameter passing, Scope, Binding. Abstract data types Arrays, Stacks, Queues, Linked Lists, Trees, Binary search trees, Binary heaps, comparison based sorting - quick sort, heap sort, merge sort Object-Oriented Programming Concepts – Object, Class, inheritance, Polymorphism, Abstraction and Encapsulation, Syntax and semantics of programming languages

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, Process Management and Scheduling, context switching, privileged mode; Threads and their Management; Tools and Constructs for Concurrency, Detection and Prevention of deadlocks, Dynamic Resource Allocation, Design of IO systems, File Management, Memory Management: paging, virtual memory management, Distributed and Multiprocessor Systems

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 the internals of Postgres SQL.

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.

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, Network Switches. Introduction to networks and layered architecture. Data communication concepts, transmission media and topology, multiplexing. Circuit switching and packet switching, data link layer, layer 2 switches and ATM switches, SONET/SDH. Medium access control. CSMA CD, TDMA, FDMA, CDMA. Network layer and addressing Routing algorithms. Transmission layer, Congestion control techniques. WAN, ATM. Internetworking. Network management and security

Web Technologies: HTML5, CSS3, XML, Basic concept of client-server computing, web server, proxy server, web application development, MVC Architecture, web services, frontend technologies.

Cyber Security and Emerging Technologies: Secure programming techniques, OWASP top 10 vulnerabilities, concepts on IoT, Blockchain, AI etc. Cloud Technology: Compute, Network, Storage Management Technologies, Edge Computing etc.

Internet Technology: Evolution of Internet, TCP/IP: addressing and routing. Internet applications: FTP, Telnet, Email, Chat. World Wide Web: HTTP protocol. Designing web pages: HTML, forms, CGI scripts and clickable maps, JAVA applets, JAVAScript, JAVA servlets, Perl. DHTML, XML. E-Commerce and security issues including symmetric and asymmetric key, encryption and digital signature, authentication. Emerging trends, Internet telephony, virtual reality over the web, etc. Intranet and extranet, firewall design issues.

Familiarity with modern software in use.

Familiarity with LINUX and UNIX commands.

Installation of modern software and OS, Server Management: ie. Windows, Linux, Ubuntu etc Debugging H/W issues.

Familiarity with handling DVR and Bio-matric system, Video Conferencing software and apps

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