Syllabus of written test for the post of Sr. Technical Officer (Advertisement Notice-04)

S.No	Examination Type	Subjects	No. of Questions	Marks	Duration
1	Multiple Choice Questions	General Intelligence and Reasoning ,General Awareness	20	20	2hrs
2		Discipline oriented	80	80	

GENERAL INTELLIGENCE & REASONING:

The test may include questions on analogies, similarities, differences, space visualization, problem-solving, analysis, judgment, decision making, visual memory, discrimination, observation, relationship concepts, arithmetical reasoning, verbal and figure classification, arithmetical number series etc. The test will also include questions designed to test your ability to deal with abstract ideas and symbols and their relationships, arithmetical computations and other analytical functions and logical sequencing.

GENERAL AWARENESS:

Questions will be aimed at testing your general awareness of the environment around you and its application to society. Questions will also test your knowledge of current events and of matters of everyday observations and experiences in their scientific aspect. The test will also include questions relating to India and its neighboring countries especially pertaining to History, Culture, Geography, sports, Economic Science, fine Arts, General Polity mainly relating to India and neighboring countries.

Computer Science Engineering (CSE)

Digital Logic
Boolean algebra. Combinational and sequential circuits. Minimization. Number representations and computer arithmetic (fixed and floating point).

Computer Organization and Architecture
Machine instructions and addressing modes. ALU, data-path and control unit. Instruction pipelining. Memory hierarchy: cache, main memory and secondary storage; I/O interface (interrupt and DMA mode).

Programming and Data Structures
Programming in C. Recursion. Arrays, stacks, queues, linked lists, trees, binary search trees, binary heaps, graphs.

Algorithms
Searching, sorting, hashing. Asymptotic worst case time and space complexity. Algorithm design techniques: greedy, dynamic programming and divide-and-conquer. Graph search, minimum spanning trees, shortest paths.

Theory of Computation
Regular expressions and finite automata. Context-free grammars and push-down automata. Regular and contex-free languages, pumping lemma. Turing machines and undecidability.

Compiler Design
Lexical analysis, parsing, syntax-directed translation. Runtime environments. Intermediate code generation.

Operating System
Processes, threads, inter-process communication, concurrency and synchronization. Deadlock. CPU scheduling. Memory management and virtual memory. File systems.

Databases
ER-model. Relational model: relational algebra, tuple calculus, SQL. Integrity constraints, normal forms. File organization, indexing (e.g., B and B+ trees). Transactions and concurrency control.

Computer Networks

Concept of layering. LAN technologies (Ethernet). Flow and error control techniques, switching. IPv4/IPv6, routers and routing algorithms (distance vector, link state). TCP/UDP and sockets, congestion control. Application layer protocols (DNS, SMTP, POP, FTP, HTTP). Basics of Wi-Fi. Network security: authentication, basics of public key and private key cryptography, digital signatures and certificates, firewalls.