

Dr B R Ambedkar National Institute of Technology, Jalandhar

Syllabus for Written Test for the Post of Senior Scientific Officer

Time: 02 Hours

(Max. Marks: 100)

Marks-30	Computer Network: 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.
Marks-20	Programming and Data Structures: Object Oriented Programming, Recursion, Arrays, Stacks, Queues, Linked lists, Trees, Binary Search Trees, Binary Heaps, Graphs, Sorting, Searching Algorithms.
Marks-20	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.
Marks-20	Web Applications: HTML, CCS, Bootstrap, PHP, JavaScript, JQuery, AJAX
Marks-10	Cyber Security: Cyber Attacks, Cyber Security Vulnerabilities, Securing Web Application, Services and Servers, Intrusion Detection and Prevention, Access control, Audit Authentication, Cryptography, Ethical Hacking, Firewalls.