

## **Indicative Syllabus for the post of Technical Officer**

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### **Section-I**

**Aptitude-** Averages, Number System, Profit and Loss, Time and Work, Problems on Trains, Compound Interest, Decimal Fractions, Calendar, Area, Problems on Numbers, Square Root and Cube Root, Boats and Streams, Probability, Interest, Percentage, Ratio, Time And Distance, Problems on Ages, Partnership, Clock, Simplifications, Volume and Surface, Problems on H.C.F And L.C.M, Logarithm, Chain Rule, Pipes and Cistern, Odd Man Out and Series, Height and Distance etc.

**Reasoning-** Number Series Compilation, Missing Number Finding, Continuous Pattern Series, Direction Sense Test, Puzzle, Verbal Classification, Matching Definitions, Logical Deduction, Series Compilations, Classification, Missing Character Finding, Odd Man Out, Blood Relations, Analogy, Coding And Decoding, Truth Verification of The Statement, Syllogisms, Analogies, Verbal Reasoning, Statement and Conclusions, Letter and Symbol Series, Logical Problems, Logical Sequence of Words, Arithmetic Reasoning, Data Sufficiency etc.

**General English-** Antonyms, Synonyms, Spelling Check, Change of Voice, Spotting Errors, Sentence Improvement, One Word Substitute, Selecting Words, Sentence Corrections, Idioms and Phrases, Communication Skills, Common Error Detection, Sentence Compilation, Ordering of Words, Ordering of Sentences, Verbal Analogies, Sentence Formation, Completing Statements, Change of Speech etc.

**GK-** Indian History, Indian Economy, Indian Culture, Environmental Science, Awards and Honors, Famous Places In India, World Organization, Sports, Books and Authors, Famous Personalities, Days and Years, World Geography, Basic General Knowledge, Physics, Biology, Indian Politics, Indian Geography, General Science, Chemistry, Technology, Inventions, Current Affairs etc.

**Computer Fundamentals-** Computer Fundamentals: Includes questions on Operating System, MS Office, MS Word, MS Excel, Power Point, Internet, E-mail, Antivirus and various online tools used in day to-day office work etc.

### **Section-II**

#### **Domain Knowledge:**

**Basic Computer Fundamentals:** Programming in C and JAVA - sequence, selection and repetition statements, Recursion, Arrays, Problems involving arrays - Error identification – debugging.

**Data Structures** – Stacks, Queues, Linked Lists, Trees, Binary Search Trees, Binary Heaps, Graphs. Operating Systems – Processes, Threads, Inter-Process Communication, Concurrency and Synchronization, Deadlock, CPU Scheduling, Memory Management and Virtual Memory, File Systems.

**File Management:** File organization: blocking and buffering, file descriptor, directory structure. File and Directory structures, blocks and fragments, directory tree, inodes, file descriptors, UNIX file structure. Concept of I/O management.

**Microprocessor Operations:** - Instruction Cycle, Data fetch, Address Decoding, Classification of Interrupts, Input Output Techniques, Device Controllers (DMA controller, Disk drive controller) Computer Memory and Memory Management Techniques: Types and characteristics, Classification Of memory devices.

**Databases** – E-R Model, Relational Model: Relational Algebra, Tuple Calculus, SQL, Integrity Constraints, Normal Forms, File Organization, Indexing: B and B++ Trees, Transactions and Concurrency Control.

System maintenance and troubleshooting – Windows and Linux OS installation procedures - Dual boot – Reserving space for User/ System while installing OS – Trouble shooting issues related to OS, device drivers – Installing packages through apt- get install – using GUI.

**Computer Networks** – Creating LAN using switches – Understanding switching tables - Networking commands – ping, IP lookup, traceroute – IP settings – DHCP – DNS - Wi- Fi settings – Wired LAN – Wireless LAN – Access points, Concepts of Layering, Flow and Error Control Techniques, Switching, IPv4/IPv6, Routers and Routing Algorithms: Distance Vector and Link State, TCP/UDP and Sockets, Congestion Control, Application Layer Protocols: SMTP, POP, FTP, HTTP.

**Network Security:** Authentication, Basics of Cryptography, Digital Signatures and Certificates, Firewalls, Basic Concepts of Client Server Programming, Cryptography, Digital Signatures and Certificates, Firewalls, Basic Concepts of Client Server Programming.

**Practical Networking:** Explain the role and function of network components: Routers, L2 and L3 switches, Next-generation firewalls and IPS, Access points, Controllers, Endpoints, Servers, Describe characteristics of network topology architectures 2 tier, 3 tier, WAN ,Small office/home office (SOHO) and cloud, Compare physical interface and cabling types, Single-mode fiber, multimode fiber, copper, Connections (Ethernet shared media and point-to-point),Concepts of PoE.

**Website design and MIS** – Website Design principles, database connectivity – applications involving HTML, CSS, JavaScript, .NET, Decision Making & Types of information systems. Management information systems, transactions processing systems, decisions support systems, office automation systems and knowledge-based systems.

**Software Engineering:** Components of Software process, process framework, process assessment, Software Life Cycle Models, Selection criteria, Process change management, Requirement Engineering process, Feasibility Study, Requirements Analysis – Structured Analysis, Object Oriented Modelling, Other approaches, Requirements Management.

**Software Design** – basic principles, concepts, Data design, Data Architectural design, Component level design, User Interface design, Pattern based Software design, Design Notations, Design Reviews – types, process, evaluating reviews, Software Design Documentation.

**ERP:** Computer Programming, ERP Modules, Benefits of ERP System etc.