



**SYLLABUS FOR THE WRITTEN TEST FOR THE POST OF
SCIENTIFIC / TECHNICAL OFFICER (MIS)**

- 1. 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.
- 2. Operating Systems** – Processes, Threads, Inter-Process Communication, Concurrency and Synchronization, Deadlock, CPU Scheduling, Memory Management and Virtual Memory, File Systems.
- 3. 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.
- 4. 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
- 5. Computer Networks** – Creating LAN using switches – Understanding switching tables - Networking commands – ping, netconfig, 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, Basic Concepts of Client Server Programming.
- 6. Website design and maintenance** – database connectivity – applications involving HTML, XML, PHP (python) and MySQL PostgreSQL database, Web Security and Configuring SSL
- 7. Information and Network Security:** Security attributes, mechanisms and attacks. Access Control and Authentication, Basics of Cryptography, Digital Signatures and Certificates. mitigating attacks. Web Denial of Service Attacks and Mitigation. Firewalls, configuration and hardening. Ethical Hacking: System reconnaissance tools, Website enumeration tools, Port Scanning tools.
- 8. Enterprise Resource Planning:** Basic concepts, Utilizing data warehouses and databases, Integrated Management Information, Business Modelling. Visual Data analytics, Customer Relationship Management in ERP Environment, Business Process Mapping in ERP, ERP Design, Decision Support Systems (DSS), Supply Chain Management. Gap Analysis and implementation.
- 9. Latest industry trends in the field of IT**