



IITPKD/R/NF/01/2024/17

15th Feb 2025

Recruitment for the post of Senior Technical Officer (Post Code : 24103) and Technical Officer (Post Code : 24106) vide Advt. No.: IITPKD/R/NF/01/2024 dated Jan 01, 2024.

Common syllabus for the post of Senior Technical Officer and Technical Officer:

Computer Networks: Topologies, Types of Networks and Internet, Media Types, Network Equipment Types and functions, Hubs, Switches, Routers, Modems, Transceivers, Firewalls, Wireless Controllers, Access Points. TCP/IP, LAN, Ethernet, Wi-Fi, Bluetooth, Mobile Networking. Configuring Router/Switch/Firewall. Protocols: ARP, EIGRP, TCP, UDP, HTTP, FTP, SSH, DNS, DHCP, NTP, RADIUS, VPN, SSL, SDN, etc. 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. Web-hosting: Web server and maintenance, Proxy Configuration (SQUID or other software), Reverse proxy, Web Security.

Operating System: System calls, processes, threads, inter-process communication, concurrency and synchronization. Deadlock. CPU and I/O scheduling. Memory management and virtual memory. File systems.

Algorithms and Architecture: Searching, sorting, hashing. Asymptotic worst case time and space complexity. Algorithm design techniques: greedy, dynamic programming and divide-and-conquer. Graph traversals, minimum spanning trees, shortest paths. Machine instructions and addressing modes. ALU, data-path and control unit. Instruction pipelining, pipeline hazards. Memory hierarchy: cache, main memory and secondary storage; I/O interface (interrupt and DMA mode).

Database: 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. Database system, Relational databases Database system, ER-Diagram Constraints, ER-Diagrams, Logical view of data, keys, integrity rules. Normalization, Database administration. Relational algebra: Selection and projection, set operations, renaming, Joins, Division, syntax, semantics. Operators, grouping and ungrouping, relational comparison. Constraints, Views and SQL (MySQL/ PostgreSQL): data definition, aggregate function, Null Values, nested sub queries, Joined relations. Data Analytics- Data Visualization-Principles of Artificial Intelligence & Machine Learning.

Cyber security: Vulnerability assessment and penetration testing (VAPT), Network security, Cryptography, Data protection Laws and regulation by IT Act 2000 and its amendments, Data analytics of logs and threat detection, Internet of Things, Ethical hacking, Hardening of servers, Data protection and disaster management, Firewalls, Web Application Filters, configuration of services in cloud computing.

Automation: Automation frameworks and tools, Programming and Scripting for automation (Python, Bash, Powershell), Applications of Programmable Logic Controllers.

Information Systems & Services: Community Information Services, Reference Service – Concept and Types; Referral Services, Alerting Services - CAS, SDI, Inter Library Loan and Document Delivery. Mobile based Library Services and Tools – Mobile OPAC, Mobile Databases, Mobile Library Website, Library Apps, Mobile Library Instructions, Augmented Reality, SMS Alerts, Geo-Location, Reference Enquiry. Web 2.0 and 3.0 - Library 2.0- Concept, Characteristics, Components; Instant Messaging, RSS Feeds, Podcasts, Vodcasts, Ask a Librarian Collaborative Services- Social Networks, Academics Social Networks, Social Tagging, Social Bookmarking. Web – Scale Discovery Services, Library Co-operation Resource Sharing and Library Networking. National Information Systems and Networks: NISCAIR, DESIDOC, ENVIS, INFLIBNET, DELNET, NICNET, ERNET, National Knowledge Network (NKN), Biotechnology Information System Network, International Information Systems and Networks: INIS, AGRIS, INSPEC, MEDLARS, BIOSIS, ERIC, Patent Information System (PIS), Biotechnology Information System (BIS). Library Resource Sharing and Library Consortia – National and International.

Data center: Server configuration, Storage -RAID, Distributed OS installation. Software Tools: Version control, Installation and management of open-source software and services, Virtualization, Hypervisor and containers, Software tools for troubleshooting, thermal management, types of air conditioning for data centers, building management systems, fire safety measures.

Programming: Programming in Java/Python/C language/bash/shell scripting. Application Development: Full stack development, Web Application Development & Deployment (XAMPP – LAMPP) High Performance Computing: CPU and GPU based programming, Schedulers, Cluster management suits, Server monitoring tools, Private cloud maintenance.

MVC framework, Web development framework (like Spring), PHP, Java technologies, J2EE technologies especially JSP, JDBC, HTMLS, JSON, Java script frontend framework like jQuery. Web service tools and XML. Database design and development for efficient on-line transaction processing environment using RDBMSs like Postgres SQL etc. System and database administration. Communication protocols like TCP/IP and HTTP. Software development processes including various like-cycle models. UML, system and class design, development, testing and maintenance of software systems.

Note:

The selection process shall consist of both multiple-choice and descriptive questions, followed by a personal interview for the shortlisted candidates.

Please note that the SCHEME OF SELECTION and DATE/TIME/VENUE shall be published in due course.

Other details and instructions shall be shared along with the hallticket that will be issued to the shortlisted candidates over email in due course.

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Registrar