

Rajasthan Public Service Commission, Ajmer

Syllabus for Screening Test for the post of

Lecturer in Computer Engineering

Technical Education Department

1. Fundamentals of Computer: Number systems, arithmetic operations, introduction to various categories of computer languages. Functional details of Input and Output devices.
2. Programming Fundamentals: “C” programming, data types(Built in and user defined), scope of variables, precedence of operators, control flow, functions, arrays, pointers, structures and unions, enumerated data-types and file handling, command line arguments.
3. Data structures and Algorithms: Abstract data types, Arrays as data structures, linked list v/s array for storage, stack and stack operations, queues, binary trees, binary search trees, graphs and their representations, sorting and searching, symbol table.

System Programming: Introduction to assembly process (One pass and multi pass assemblers), macro assemblers, linkers, loaders.

Compilers: Context free grammar, regular expressions, lexical analysis, parsing and code generation.

Algorithms: Tree traversals, Branch and bound and greedy methods, complexity of algorithms.

4. Digital Logic Systems and Microprocessors: Boolean expressions, K-maps, TTL and CMOS logic families, combinational logic design using half/full adders, subtractors, and multiplexers, synchronous sequential system design.

Microprocessors: 8085, 8086 architecture, data transfer scheme and interfaces, Addressing modes.

5. Operating Systems: CPU scheduling, Deadlocks, Memory management, file systems, disk scheduling. Concept of Client server architecture in distributed environment and RPC. Process, threads and their synchronization.

Real Time OS: clock synchronization and task scheduling.

System initialization, booting and handling user accounts. Backup and restore, Bourne shell programming for Linux.

6. Computer Organization and Architecture: Von-Neumann architecture of computers. Registers and micro operations, control logic, processor addressing and bus organization. Processor input/output and DMA. Memory organization and cache coherence.
7. Database Management System: E-R models, Relational algebra, calculus and databases. Integrity constraints, triggers, normalization, and indexing. Transaction processing and concurrency control.

8. Data and computer networks: TCP/IP & OSI/ISO reference models, functions of different layers, characteristics of physical media, multiplexing in physical layer, medium access protocols, introduction to 802.3, 802.4, 802.5, 802.11 LAN technology, IP protocol including routing and congestion control, TCP and UDP, DNS.
9. Object Oriented Programming using C++ and JAVA: Objects and classes. Inheritance, polymorphism, event and exceptions handling, files and streams. Applets in JAVA.
10. Software Engineering: Phases of System Development Life Cycle. System modeling. Software requirement specifications and DFDs. Introduction to software testing, software project management.
11. Network Security: Groups, rings and fields in finite space, Euler and Fermat's theorem, primality testing, security services and mechanisms, symmetric and asymmetric encryption including DES, AES, IDEA, RSA algorithms, key management in symmetric and asymmetric encryption, message authentication and hashing, email security, viruses and trusted systems.
12. Basics of communication: Channel capacity, attenuation, communication impairments, propagation of EM waves through free space (excluding free space models). PCM and delta modulation, WDM, brief introduction to GSM and CDMA based communication systems.

Pattern of Question Paper

1. Objective type Paper
2. Maximum Marks – 100
3. Number of Questions – 100
4. Duration of Paper : two Hours
5. All Questions carry equal Marks
6. There will be Negative Marking