

Rajasthan Public Service Commission, Ajmer
Syllabus for Screening Test for the post of
Lecturer in Computer Engineering
Technical Education Department

1. Digital Logic & Computer Organization: Logic Functions, Minimization, Design and synthesis of combinational and sequential circuits; Number representation and computer arithmetic (fixed and floating point). Machine instructions and addressing modes, ALU and data-path, CPU control design, Memory interface, I/O interface (interrupt and DMA mode), Instruction pipelining, Cache and Main memory, Secondary storage.

2. Data Structures & Algorithm : Programming in C; Functions, Recursion, Parameter passing, Arrays, Stacks, Queues, Linked Lists, Trees, Binary search trees, AVL Trees. Analysis, Worst and average case analysis; Greedy approach, Dynamic programming, Divide-and-conquer; Tree and graph traversals, connected components, Spanning trees, Shortest paths; Hashing, Sorting, Searching.

3. Operating System: Processes, Threads, Inter-process communication, Concurrency, Synchronization, Deadlock, CPU scheduling, Memory management and virtual memory, File systems, I/O systems, Protection and security.

4. Databases & E-Commerce: ER-model, Relational model (relational algebra, tuple calculus), Database design (integrity constraints, normal forms), Query languages (SQL), File Structures (sequential files, indexing, B and B+ trees), Transactions and concurrency control. Concepts of E-Commerce, benefits, growth, e-payments and virus related to E-Commerce.

5. Computer Networks & Security: ISO/OSI stack, LAN technologies (Ethernet, Token ring), Flow and Error control techniques, Routing algorithms, Congestion control, TCP/UDP and sockets, IP (v4), Application layer protocols (icmp,dns,smtp,pop,ftp,http). Classical Encryption Techniques, Symmetric Cipher Model, Substitution Techniques, Steganography, Block Ciphers and the Data Encryption Standard, Transport-Level Security, Wireless Network Security, Electronic Mail Security, IP Security.

6. Software Engineering & Object Oriented Programming in C++: Implementation of Object Oriented Programming concepts in C++: friend function, operator overloading, nested classes, templates Data/File handling. System Analysis, Software Project Management, requirement Analysis Software Design.

7. Computer Graphics & Multimedia: DDA, Bresenham Algorithm, 2D and 3D Transformation, Hidden Surface removal, Line clipping and polygon clipping, MM. Introduction, Framework, Image Compression Standards, Jpeg, Mpeg, Midi format.

8. Embedded System: Categories and requirements of embedded systems and challenges and issues in embedded system, 8 bit microcontrollers architecture, instruction set/programming of Intel MCS51 family (8) bit. Simulation of a process control System.

9. Data Mining and Warehousing: Introduction of data warehousing, basic concepts, data function, tools to support data reconciliation. Data Modeling Techniques and Options: Dimensions and Query Hierarchies, Star Schema, Data transformation.

10. Numerical Methods: Numerical solutions of non-linear algebraic equations by Secant, Bisection and Newton-Raphson Methods.

Pattern of Question Paper

1. Objective type paper
2. Maximum marks- 100
3. Number of questions 100
4. Duration of paper - 2 hours
5. All question carry equal marks
6. There will be negative marking
