

APPENDIX - A**SYLLABUS DETAILS FOR THE POST OF SYSTEMS OFFICER****Data Structure:**

Notion of abstract data types, stack, Queue, List, Set, String, Tree, Binary search tree, Heap, Graph.

Programming Methodology:

C-Programming, Program control (iteration, recursion, Functions), Scope, Binding, Parameter passing, Elementary concepts of Object oriented, Functional and Logic Programming.

Algorithms for problem solving:

Tree and graph traversals, Connected components, Spanning trees, Shortest paths; Hashing, Sorting, Searching; Design techniques (Greedy, Dynamic Programming, Divide-and-conquer).

IMP: Analysis, design and algorithm

CONCEPT:

Concept of algorithm, component of algorithms, numerical algorithms, review of searching algorithm, review of sorting algorithm, recursion v/s iteration, introduction to graph theory, matrix representation, trees, divide & conquer: binary search, max – min search & merge sort, integer multiplication, cassette filling, knapsack problem, job scheduling, backtracking, branch & bound, shortest path, minimal spanning trees, technique for graphs.

Compiler Design:

Lexical analysis, Parsing, Syntax directed translation, Runtime environment, Code generation, Linking (static and dynamic).

Operating Systems:

Classical concepts (concurrency, synchronization, deadlock), Processes, threads and Inter-process communication, CPU scheduling, Memory management, File systems, I/O systems, Protection and security.

Databases:

Database management system concepts, database system concept and architecture, Entity relationship and enhanced e-r relational data model and relational algebra, relational database design, query language-sql, normalization.

IMP: Relational model (ER-model, relational algebra, tuple calculus), Database design (integrity constraints normal forms), Query languages (SQL), File structures (sequential files, indexing, B+ trees), Transactions and concurrency control.

Computer Networks:

ISO/OSI stack, sliding window protocol, LAN Technologies (Ethernet, Token ring), T C P/U D P, IP, Basic concepts of switches, gateways, and routers.

IMP: Network Types and topologies: Network types, ethernet, Intranet and extranet, star ring and bus topology, SUBNET, network hardware, N.I.C., hubs, routers, switches.

Network APPLICATION: telnet, smtp, pop3, ftp, ping, network services: DNS, WINS.

Computer Hardware:**Digital Logic:**

Logic functions, Minimization, Design and synthesis of Combinational and Sequential circuits; Number representation and Computer Arithmetic (fixed and floating point).

Computer Organization:

Machine instructions and addressing MODES, ALU and Data-PATH, hardwired and micro-programmed CONTROL, Memory interface, I/O interface (Interrupt and DMA mode), Serial communication interface, Instruction pipelining, Cache, main and secondary storage.