

Computer Engineering

Unit :1. Discrete Mathematics:

Set theory, Principle of mathematical induction, relations, functions, algebraic structures - semigroup, monoid, group, propositional Calculus, generating functions and graph theory.

Unit :2. Theoretical Computer Science:

Basic concepts of Strings, alphabets, languages, finite automata, regular expression, regular sets, minimization of finite automata, Chomsky hierarchy languages, relation between classes of languages, context free grammar, pushdown automata, linear bounded automata, Turing machine, halting problem and decidability.

Unit :3. Numerical Methods:

Number representation and the concepts of precision, errors in Computation, analysis procedures and error estimation, interpolation, root finding, Linear systems of equations, differentiation and integration.

Unit :4. Resources Management Techniques:

Types of models - Linear Programming - Transportation model - assignment models - Sequencing models - theory of games - Queueing models - replacement models - inventory models - simulation.

Unit :5. Digital Computer Fundamentals:

Number systems - Conversions - logic circuits - Registers - Counters - Half adder, Full adder Circuits - I/O Devices.

Unit :6. Operating Systems:

Process states - interrupt processing - dead lock - main memory storage (fixed and variable partitioning, multiprogramming) - Virtual memory management - page replacement algorithms - job and processor scheduling - process scheduling Algorithms - Disk scheduling - file systems.

Unit :7. Data and File Structures:

Stacks - Queue - evaluation of expressions - Infix, Prefix & Postfix forms - Linked Lists (single & double) - Sorting (Binary, quick, merge, heap, radix) - Binary trees - file organisation (sequential, random, indexed sequential).

Unit :8. 'C' Programming:

C Fundamentals (data types, looping statements, I/O statements & Conversion of data types) - Arrays (Strings & Character) - Pointers - String functions - preprocessors.

Unit :9. Object Oriented Programming:

OOP Concepts - C++ function - arguments passing - function overloading - operator overloading - Constructors and destructors - types of inheritance - Virtual functions - This Pointer - file pointers.

Unit :10. Relational Database Management System:

Data models - relational data base - SQL Data Manipulation - functional dependency - Normal forms - Design and implementation of typical data base systems - internal and external consistency - Concurrency Control techniques.

PAPER -II

Unit 1: Microprocessors & Assembly Language Programming:

Microprocessors - Evolution and organisation - instruction set 8085 - microprocessor timings - interfacing memory and i/o - devices - interfacing devices - applications of microprocessors - different processor details - Assembly language programming.

Unit 2: System Software:

Assemblers, loaders, linkers, macroprocessors, text editors, programming languages, lexical analysis, parsing, precedence grammars, symbol tables, scope rules and parameter passing mechanisms, syntax directed translation, runtime environment, machine code generation, interpreters.

Unit 3: Design & Analysis of Algorithms:

Design techniques, divide and conquer, greedy method, dynamic programming etc, graph algorithms strassen's matrix multiplication algorithm, geometric algorithms, NP- complete problems, approximation algorithms.

Unit 4: Computer System Architecture:

Elements of computer organization - machine instruction - addressing modes - instruction pipelining - memory organization, CPU, System bus and standards, von neuman, non-von Neuman architectures, language directed architectures, RISC architecture - I/O Subsystems, Hierarchical memory, virtual memory system, Cache memory - architectural classification, pipelined processors, vector processing, array processors, Multiprocessor architectures.

Unit 5: PC Maintenance & Trouble shooting:

PC hardware Components - Microprocessors in PC motherboard Circuits - Printer Controller - disk controller (floppy and hard) - display adapter - auxiliary subsystems (Serial port, Real time clock, LAN, memory expansions & backup) - installation & preventive maintenance - Trouble shooting (Nature of faults, types of faults, systematic trouble shooting - diagnosis, rectifications, diagnostic software - problems in mother board, printer interface, serial port, display adapter - disk drives).

Unit 6: Software Engineering:

System analysis - System modelling - Software prototyping - Object oriented design - design heuristics - Jackson System development - Warrier - Orr diagrams - real-time system - software reuse - CASE - quality assurance - quality metrics - Software testing.

Unit 7: Computer Networks:

Concepts of data communication, LAN evolution - OSI - ISO 7 layer model and design issues - Physical layer, transmission media, packet and circuit switching, topologies, Data link layer, LAN, token

passing, sliding window protocols, protocol specification and verification, network layer, routing, congestion control, Transport layer, session and presentation layer, design issues, application layer, file transfer, electronic mail, Multimedia systems, mobile computing.

Unit 8: Computer Graphics:

Interactive computer graphics - Raster Scan & random Scan systems - Input & Output devices - Output primitives - attributes - area filling.
2-D, and 3-D transformations - Matrix representations, viewing, windowing, clipping algorithms, picture construction techniques - curves-3D concepts - 3D display techniques - parallel and perspective projection - Depth cueing - Hidden surface/line elimination back face removal.

Unit 9: Visual Programming:

Fundamental of Visual Basic, and NET, VB tools, forms, Property Settings, Variables, Number constants, arrays, pointers, Statements in VB manipulation of objects in VB and File operations, database features.

Unit 10: Internet & Java Programming:

Browsers - URL definitions - WWW - Client/Server architecture in internet - domain name extension types - addressing Scheme - Java fundamentals - Constructors - dynamic method despatch - packages & interfaces - applets.