

AURCET - 2013 SYLLABUS

TEST NO. 73 :: COMPUTER SCIENCE & SYSTEMS ENGINEERING

(100 MARKS)

1. Data Structures & Algorithms:
Abstract Data Types, Arrays, Stacks, Linked Lists, Graphs, Trees, Binary Search Trees, Binary Heaps; Space & Time Complexity of Algorithms, Analysis Design, Tree & Graph Traversals, Spanning Trees, Shortest paths, sorting, searching, hashing, Divide & conquer & dynamic programming techniques.
2. Programming Concepts:
Basic programming Concepts in C: Functions, Recursion, Parameter passing, pointers; Basic concepts in C++ : Classes, inheritance, polymorphism, streams & files; Basic concepts in Java: Classes, methods & interfaces, threading, libraries.
3. Computer Organization & Architecture:
Computer Registers, Computer Instructions, Instruction Cycle, Memory-Reference Instructions, Input-Output and Interrupt, Complete Computer Description, General Register Organization, Stack Organization, Instruction Formats, Addressing Modes, Data Transfer and Manipulation, Memory Hierarchy, Main Memory, Auxiliary Memory, Associative Memory, Cache Memory, Virtual Memory.
4. Operating Systems:
Process, Threads, Inter process Communications, Concurrency, Synchronization, Deadlocks, CPU Scheduling, Memory Management and virtual memory, File Systems, IO Systems, and Protection & Security.
5. Theory of Computation:
Finite Automata, Regular Expressions, Regular sets and Pumping Lemmas, Context Free Languages and Pushdown Automata, Turing Machines and computability.
6. Language Processors & Compilers:
Lexical Analysis, Parsing, Semantic Checking & Syntax Directed Translation, Code Optimization & Code Generation; Introduction to Assembly Language Programming, Instruction Formats, Data formats - Role of Base Register, Index Register, Single Pass & Double Pass Assemblers, .
7. Data Base Management Systems:
Overview of File system and DBMS, DBMS structure, E-R Models, Relational Model, Relational Algebra, Tuples Calculus, Database design, Normal forms, Storage data, queries, Query Languages(SQL), File Structures, Sequential files, indexing, B and B+ trees, Transaction Management & Concurrency Control.
8. Data Communications & Computer Networks:
OSI & TCP IP Reference Models, LAN Technologies, Routing Algorithms, Congestion Control, TCP UDP Socket, Application Layer, Protocols(smtp, dns, pop, ftp, http), Basic concepts of hubs and switches, gateways and routers. Fibre optic & Wireless

Communication Technologies. RFID System Architecture.

9 . Operation Research & Statistics:

Linear & Non-linear Programming, Dynamic programming, Simplex methods, Transportation & Assignment problems, Travelling salesman Problems, PERT, CPM techniques; Probability Distributions Binomial, Poisson Negative binomial distributions, Normal, exponential distributions, Correlation & Regression Analysis, Multiple Regression, Sampling distribution, Testing of Hypothesis, Small & Large Sample Tests, χ^2 – test, analysis of variance and Queuing Theory Fundamentals.

10. Object Oriented Software Engineering:

The nature of software, software engineering , software engineering projects, Domain analysis, Requirement definition, type of requirements, gathering and analyzing of requirements, requirements document, UML diagrams, User-Centred design, Developing use case models of systems, The process of software architecture& design, Design document, Testing and inspecting to ensure high quality, Documentation defects, Writing formal test cases and test plans, Strategies for testing large software, Inspections, Quality assurance, Project management, Software process model, Cost estimation, Project scheduling and tracking, Contents of a project plan

11. Web Technologies: Basic Concepts in Client Server Computing, HTML, XML, JAVA Scripts, JAVA Beans, Web servers & Servlets, JSP Applications and Database access using JDBC & ODBC