

Gate 2015 Exam Syllabus for Computer Science and Information Technology (CS-IT)

General Aptitude (GA)-Multiple Choice Test

- **This Paper Consists of Verbal Ability:** English grammar, verbal analogies, instructions, critical reasoning and verbal deduction, Sentence completion, Word groups

Engineering Mathematics- Mathematical branch that includes mathematical methods and techniques that are generally employed in Industry and engineering

- **Mathematical Logic:** Sub-division of mathematics that includes detailed mathematical analysis of logic and applying formal logic to other regions of mathematics. It include topics- to First Order Logic. Propositional Logic.
- **Probability:** Probability is the way to roughly judge the occurrence of a thing or to what extent a statement is true. It include topics- Median, Mean, Mode and Standard Deviation; Random Variables; Distributions; normal, uniform ,exponential, Poisson, Binomial, Conditional Probability
- **Set Theory & Algebra:** Set theory is a accumulation of objects and Algebra indicates a definite mathematical structure like number theory, geometry and analysis. It include topics- Relations; Sets, Functions; Partial Orders; Groups; Boolean Algebra; Lattice algebra.
- **Combinatorics:** Study of discrete structure whose total no. can be determined . It include topics- Combinations; Permutations; Counting; Summation; recurrence relations; asymptotic; generating Functions.
- **Graph Theory:** It is the study of graphs use to describe in a simplified manner the paired relations between objects. It include topics- spanning trees; Connectivity; Cut vertices & edges; matching; covering; independent sets; Colouring; Isomorphism; Planarity.
- **Linear Algebra :** It consists of vector spaces as well as linear mappings. It include topics- determinants, Algebra of matrices; systems of linear equations, Eigen vectors and Eigen values.
- **Numerical Methods:** It consists of set of rules which uses numerical approximation to find an answer to the problems of mathematical analysis. It include topics- LU decomposition for systems of linear equations; numerical solutions of non-linear algebraic equations by Bisection, Secant and Newton-Raphson Methods; Numerical integration by Simpson and trapezoidal's rules.
- **Calculus:** Mathematical branch that studies change in a mathematical manner. It include topics- Continuity , Limit & differentiability, Mean value Theorems,

Theorems of integral calculus, evaluation of Improper & definite integrals, Total derivatives, Partial derivatives, minima & maxima.

Gate syllabus for cse

Computer Science and Information Technology-

- **Digital Logic:Representation of signal by discrete bands of analog levels.** It include topics- Logic functions, Minimization, Design and synthesis of sequential and combinational circuits; Number representation and computer arithmetic (floating and fixed point).
- **Computer Organization and Architecture: It is the detail analysis of hardware and software of a computer** It include topics-Machine instructions and addressing modes, data-path and ALU, CPU control design, I/O interface (DMA and Interrupt mode) , Main and cache memory, Secondary storage, Memory interface Instruction pipelining.
- **Programming and Data Structures:It refers to coding and way of keeping things & arrange data in a systematic manner.** It include topics- Programming in C ; Recursion, Functions , Parameter passing, Binding, Scope; Abstract data types, Arrays, Queues, Stacks, Linked Lists, Trees, Binary heaps, Binary search trees.
- **Algorithms:It is the step by step procedure for performing a task.** It include topics-Analysis, Asymptotic notation, Notions of time and space complexity, Worst and average case analysis; Design: Greedy approach, Divide-and-conquer , Dynamic programming; Graph and tree traversals, Connected components, Shortest paths ,Spanning trees; Hashing, Searching, Sorting. Asymptotic analysis (worst, best, average cases) of space and Time, Lower and Upper bounds, Basic concepts of complexity classes NP,P, NP-complete, NP-hard.
- **Theory of Computation:It is the branch that deals with whether an answer can be found to a problem and how well it can be solved using a step by step approach.** It include topics-Regular languages and finite automata, Push-down automata and Context free languages , Turing machines and Recursively enumerable sets, Undecidability.
- **Compiler Design: The compiler should be planned in such a manner that it has the ability to change the source program (in one programming language) into equivalent program (in another language).** It include topics- Syntax directed translation, Parsing, Runtime environments, target and Intermediate code generation, Basics of code optimization; Lexical analysis.
- **Operating System:Accumulation of softwares that supervises computer hardware.** It include topics-Threads, Processes, Inter-process communication, Synchronization, Concurrency, Deadlock, CPU scheduling , File systems, I/O systems, Security and Protection, Memory management and virtual memory.
- **Databases:It refers to accumulation of data in a systematic manner.** It include topics-ER-model, Relational model (tuple calculus, relational algebra), Database design (normal forms, integrity constraints), File structures (

indexing, sequential files, B +and B trees), Query languages (SQL), Transactions and concurrency control.

- **Information Systems and Software Engineering: Detail analysis of complimentary hardware and software that is use to regulate the information by people as well as organization.** It include topics- information gathering, feasibility and requirement analysis, process specifications, input/output design, data flow diagrams, process life cycle, planning and managing the project, design, testing, coding, maintenance, Implementation.
- **Computer Networks: Telecom. network by which data is being interchanged through computer. It include topics- ISO/OSI stack, LAN technologies (Token ring, Ethernet), Routing algorithms, Flow and error control techniques , Congestion control, IP(v4), TCP/UDP and sockets, Application layer protocols (dns, pop, http, ftp, smtp, icmp); Network security basic concepts of private and public key cryptography, digital signature, firewalls, Basic concepts of hubs, gateways, switches and routers.**
- **Web technologies: It helps to plan HTML pages.** It include topics- basic concepts of client-server computing, XML & HTML.

