

Department of Computer Science & Engineering, IIT Guwahati.

Dual Degree (M.Tech+Ph.D) Admission (July 2019): Syllabus for the Written Test

General Aptitude:

Verbal Ability: English grammar, Sentence completion, Verbal analogies, Word groups, Instructions, Critical reasoning and verbal deduction.

Numerical Ability: Numerical computation, Numerical estimation, Numerical reasoning and data interpretation.

Set Theory & Algebra:

Sets; Relations; Functions; Groups; Partial Orders; Lattice; Boolean Algebra.

Linear Algebra:

Algebra of matrices, determinants, systems of linear equations, Eigen values and Eigen vectors.

Numerical Methods:

LU decomposition for systems of linear equations; numerical solutions of non-linear algebraic equations by Secant, Bisection and Newton-Raphson Methods; Numerical integration by trapezoidal and Simpson's rules.

Probability and Statistics:

Sampling theorems, Conditional probability, Mean, median, mode and standard deviation, Random variables, Discrete and continuous distributions, Poisson, Normal and Binomial distribution, Correlation and regression analysis.

Programming and Data Structures:

Programming in C; Functions, Recursion, Parameter passing, Scope, Binding; Abstract data types, Arrays, Stacks, Queues, Linked Lists, Trees, Binary search trees, Binary heaps, Sorting and Searching.

Digital circuits:

Boolean algebra, minimization of Boolean functions; logic gates; digital IC families (DTL, TTL, ECL, MOS, CMOS). Combinatorial circuits: arithmetic circuits, code converters, multiplexers, decoders, PROMs and PLAs. Sequential circuits: latches and flip-flops, counters and shift-registers. Sample and hold circuits, ADCs, DACs. Semiconductor memories. Microprocessor(8085): architecture, programming, memory and I/O interfacing.