

**Department of Computer Science & Engineering
National Institute of Technology Srinagar**

Syllabus for Entrance Examination for Ph D Admission

Section A

Note: 30 questions from the sub-sections 1-7.

- 1. Programming Language**
(Concepts and Methodology for C, C++, Java)
- 2. Discrete Mathematics**
(Sets, Relations, Lattices, Graphs Theory, Propositional Calculus, Group Theory)
- 3. Data Structures**
(Linked List, Queue, Stack, Trees, Sorting, Searching)
- 4. Design and Analysis of Algorithms**
(Asymptotic Notation, Computational Complexity, Divide & Conquer, Greedy methods, Dynamic Programming, Graph Searching and Traversal, Backtracking, Branch and Bound)
- 5. Theory of Computation**
(Complexity Theory, Theorems and Proofs, Formal Languages and Automata, Context Free Languages and Computability Theory)
- 6. Computer Architecture and Organization**
(CPU, I/O, Memory, Parallel Processing)
- 7. Operating Systems**
(Concurrent Processes, CPU Scheduling, Deadlock, Memory Management, I/O Management Disk Scheduling and Files)

Section B

Note: 15 questions from the sub-sections 8-11.

- 8. Computer Networks and Security**
(Network Protocol Architecture, Error and Flow Control, Congestion Control, Switching Techniques, Routing, Security Algorithms- DES, AES, 3DES, SHA and its versions, Authentication Algorithms)
- 9. Wireless Communication**
(antenna basics, radio propagation, coding and error control, MAC protocols, mobility, TCP and wireless, wireless LANs and ad-hoc networks, cellular communication concepts, and security in wireless systems).
- 10. Artificial Intelligence**
(Search, Knowledge Representation and Reasoning, Rule Based Representation, Theorem Proving and Expert Systems)

11. Data base Management

(Relational Database Design, Query Processing, Object oriented and Object Related Databases)

Section C

Note: 15 questions from the sub-section 12.

12. Engineering Maths and general aptitude