

C + DS

Important Points :

This is the most important subject according to GATE point of view. Approximately 25% Questions in Gate come from above topics and all are related with each other. If you are good in this subject this will not only help you in GATE but also after it in so many written exams and interviews of Different IITs and IIITs.

C programming Questions are mostly based on finding outputs which contain some pointers, static variables, arrays, strings, functions etc. So the best way to practice C programming question is take questions from different books, try to solve them and try to do programming on Compiler. It will increase your skills and accuracy. Very high chances of common data questions. So if you are not good at programming start practice from now.

Understand Different Problems on Stack, Queue, Link List. Generally they come in a C program, But you can solve them only if you know the logic. Properties of Heap. Deletion and insertion of items in the heap.

Practice Tree problems like no of leaf nodes, non leaf nodes, total nodes, height of the tree, no of full nodes, mirror image, etc. AVL tree and balancing them on insertion and Deletion. Binary tree, Binary Search Tree, Inorder, Preorder, Postorder traversal. Spanning Trees, Minimum Spanning Tree problems.

Finding Complexity : Very Important Topic. You need to practice more and with every problem you solved. Sometimes direct question comes related to complexity like give complexity of Heap sort. But mostly you are given a code or question. You need to find best average case complexity of that problem. So try to find complexity of every algorithm or program which you practice. Also understand properties of complexity. Sometimes relation between them is asked.

Searching and Sorting Problems. Difference between Different Techniques and how to apply them on different real life problems.

Questions on approach of dynamic programming, Divide and Conquer, Greedy and Brute Force. Practice basic problems like quick sort, merge sort, knapsack problem, matrix chain multiplication, LCS, Job sequencing, Compressing Mechanism. It will help you to solve other tricky problems.

Basic Theory of P-NP class

Operating System

Syllabus : Processes, Threads, Inter-process communication, Concurrency, Synchronization, Deadlock, CPU scheduling, Memory management and virtual memory, File systems, I/O systems, Protection and security.

Important Points :

- Scheduling : Numerical Questions have more chances. Practice more in finding turn around time and waiting time of different scheduling policies.
- Deadlock : Bankers Algo, Given Sequence is safe or not. Chances of common data or linked questions.
- Synchronization : High Probability Of Questions in exam. Practice some question related to semaphores and classical problems of synchronization (this will help you to solve other questions)
- Memory Management : Questions generally comes from page table size, number of pages, logical address, physical address, page size, inverted page table, virtual memory, TLB etc.

Theory Of Computation :

Syllabus : Regular languages and finite automata, Context free languages and Push-down automata, Recursively enumerable sets and Turing machines, Undecidability.

Important Points :

- Finite Automata covers approximately 50% questions from TOC. So give it more time than others. Do questions related to finding minimum number of states, NFA to DFA conversion, Closure Properties of finite automata, Finding Regular Expressions, mealy moore machine etc.
- In Context free grammar practice more on simplification of CFG, pushdown automata, closure properties etc.
- Do problems on finding category of any language or grammar.
- Concepts related to expressive power of different languages.
- Basic problems related to NP-Completeness. Properties of Recursive and Recursive Enumerable Languages.
- Turing Machine making and expressive power of different type of turing machine. (also useful for interview)

Compiler Design

Important Points :

- Parsing : there is always a question related to parsing. You need to practice all parsing technique because there is also chances for linked questions. finding first and follow, LL(1)-LR(1)-SLR-LALR-CLR.
- Precedence and Associativity of operators.
- Finding value from expression tree.
- Ambiguous grammar.

Databases

Important Points :

- No gate paper completed without Normalization. This is very easy once you understand and can solve questions quickly. Questions are like Finding normal form (comes 70% times in gate paper), finding candidate keys, decomposition of relation, loss less join and dependency preservation have more probability to come.
- SQL Queries also asked in the paper. Practice select clause properly with properties of having, group by, any ,all, exists. Question may come with relational algebra in common data section.
- Practice joins because there is more probability of tricky questions from them.
- Finding View and Conflict serializability. Finding Recoverable and Cascade schedule. lock based, Two phase, time stamp and graph based protocol with there properties like deadlock freedom, starvation freedom.
- formation and structure of B and B+ trees. primary and clustering index. Numerical Questions from no of block required in indexing of different type, collision resolution, minimum and maximum no of nodes in B,B+ trees.

Digital Logic

Syllabus : Logic functions, Minimization, Design and synthesis of combinational and sequential circuits; Number representation and computer arithmetic (fixed and floating point).

Important Points :

- Digital logic contains very simple questions. If you practice and use your brain in a right way you can do them easily.
- Practice K-Map. very high chances of very simple question. Don't loose your marks here.
- Practice Multiplexer, De-multiplexer, Encoder, Decoder questions.
- Understand concept of flip flop. They are given and modulus of counter is asked.
- Practice questions related to Floating Point representation, integer representation, ieee format, range and precision.

Computer Organization and Architecture

Syllabus : Machine instructions and addressing modes, ALU and data-path, CPU control design, Memory interface, I/O interface (Interrupt and DMA mode), Instruction pipelining, Cache and main memory, Secondary storage.

Important Points :

- Addressing Modes : Theory and questions
- Numerical related to program counter after some instruction, no of one address-two address instructions, Values after shift and rotate instructions, horizontal and vertical programming related questions.
- Numerical Problems on Speed up of pipeline, time taken to complete instruction in pipeline and non-pipeline architectures, Hazards in pipeline, hazards removal, branch penalty etc.
- Numerical Problems on cache memory organization, mapping technique, multilevel caches, write through and write back technique
- Questions are more tricky in this subject. So you need to practice more on different types of Numerical Questions.

Computer Network

Syllabus : ISO/OSI stack, LAN technologies (Ethernet, Token ring), Flow and error control techniques, Routing algorithms, Congestion control, TCP/UDP and sockets, IP(v4), Application layer protocols (icmp, dns, smtp, pop, ftp, http); Basic concepts of hubs, switches, gateways, and routers. Network security – basic concepts of public key and private key cryptography, digital signature, firewalls.

Important Points :

- Addressing related questions : Subnet address, supernet address, broadcast address, range of network, no of host, classless addressing, non continuous addresses, first host and last host finding etc.
- Properties Of Circuit Switching and packet switching, Routing Protocols and Numerical Problems on them.
- Flow Control and Error Control Policies. Numerical Problems on Window Size, No Of Sequence bits, frame size, bandwidth, round trip time, utilization, Hamming Distance, CRC. Congestion Control policies like slow start, congestion avoidance and Congestion Detection.
- IP Header , TCP and UDP header format, theory related to Ethernet and token ring.
- Basics Of Different Type of protocols like : FTP , HTTP , DHCP , ARP , RARP , SMTP , ICMP ,POP
- Basic Concepts of Cryptography and firewalls.

Information System and Software Engineering

Syllabus : information gathering, requirement and feasibility analysis, data flow diagrams, process specifications, input/output design, process life cycle, planning and managing the project, design, coding, testing, implementation, maintenance.

Important Points :

- This Subject is more related with theory. So better collect some institutes notes on this subjects or prepare yourself.
- Numerical Problem may come from COCOMO model, cyclomatic complexity etc.
- Study Different Models and there properties along with difference between them. Data flow Diagrams are also important.