

# Complete Interview Preparation



Detailed  
Course Syllabus

## 1) Resume Building

Resume Building

## 2) Programming Languages

**Programming Languages:**

- **C++** : Introduction and Basic I/O, Variables, Different Errors, Operators, Loops, Arrays, String, Functions, Pointers, Dynamic Memory Allocation, Exception Handling and Smart Pointers
- **Java** : Introduction and Basic I/O, Variables , Operators, Loops, Exception Handling, Arrays, String , Immutable Strings, ArrayList , BigInteger

## 3) Object Oriented Programming

**Object Oriented Programming:**

- Classes and Objects
- Inheritance and Polymorphism : Overloading and Overriding
- Abstraction and Encapsulation
- Access Modifiers
- Friend and Virtual functions in C++
- static, final, this and super keywords and Interfaces in Java

## 4) Data Structures ( Basics )

- **Analysis of Algorithms:**
  - Growth of functions
  - Asymptotic Notations Omega, Theta,
  - Recursion Tree Method
  - Space Complexity
- **Arrays:**
  - Insertion, Deletion, Updation, Shifting
  - Reversal, Sort Check, Maximum, Minimum
- **Recursion**
  - Introduction to Recursion
  - Tail Recursion
  - Natural Number Check Using Recursion

- Palindrome Check Using Recursion
  - Sum of Digits, Rod Cutting and Subsets
  - Tower of Hanoi
- **Hashing:**
  - Introduction to Hashing
  - Direct Address Table
  - Collision Handling
  - Chaining
  - Open Addressing
  - Double Hashing
  - Chaining Vs Open Addressing
- **String:**
  - Introduction to Strings
- **Searching:**
  - Linear Search
  - Binary Search (Iterative and Recursive)
- **Sorting:**
  - Stability in Sorting Algorithm
  - Bubble Sort
  - Selection Sort
  - Insertion Sort
  - Quick Sort
  - Different Partition Schemes in QuickSort
  - Merge Sort
  - Lomuto Partition
  - Hoare Partition
  - Heap Sort
  - Counting Sort
  - Radix Sort
  - Bucket Sort
- **Linked List:**
  - Drawback of Arrays
  - Introduction to Linked List and Implementation
  - Traversal, Insertion and Deletion
  - Sorted Insertion in Linked List
  - Reversal of Linked List (Iterative and Recursive)
  - Finding Middle
  - Remove Duplicate from Sorted Linked List
- **Circular Linked List:**
  - Traversal
  - Insertion (Head, End)
  - Deletion (Head, Kth Node)

- **Doubly Linked List:**
  - Traversal
  - Insertion (Head, End)
  - Deletion (Head, End)
  - Reversal
  - Circular Doubly Linked List
- **Stack:**
  - Introduction to Stack Data Structure
  - Implement using array
  - Implementation using Linked List
  - Stack Applications
- **Queue:**
  - Introduction to Queue Data Structure
  - Implementation using array
  - Implementation using Linked List.
- **Dequeue:**
  - Introduction to Deque Data Structure.
  - Implementations using Array
  - Implementation using Linked List
- **Tree:**
  - Implementation
  - Traversals: preorder, postorder, inorder, level order(Iterative & Recursive)
  - Binary Tree: Height, Size, Maximum
  - Print Nodes at K Distance
- **BST:**
  - Implementation
  - Search
  - Insertion
  - Deletion
  - Floor and Ceil in BST in CPP and Java
  - Self Balancing BST
  - AVL Tree (Introduction and applications)
  - Red-Black Tree (Introduction and applications)
  - Applications of BST
- **Heap:**
  - Implementation
  - Insert
  - Heapify and Extract in Heap
  - Decrease Key, Delete and Build Heap

## 5) Libraries

### C++ STL

- **Introduction to STL**
  - i) Introduction and Application
  - ii) Iterators
  - iii) Templates
  - iv) Function Templates
  - v) Class Templates
- **Pairs in CPP STL**
  - i) Introduction
  - ii) Problem(With Video Solutions): Sorting an array according to another array
  - iii) Practice Problems
    - (1) This track contains many practice problems for the users which are considered important and must-do as far as Data Structure and Algorithm is concerned.
- **Vectors in CPP STL**
  - i) Introduction
  - ii) Vector Declaration
  - iii) More functions of Vectors
  - iv) Time Complexities of different operations and passing Vectors to function
  - v) Internal Working of Vectors
  - vi) Problems(With Video Solutions):
    - (1) Vector and Vector of Pairs
    - (2) Keeping track of previous indexes after sorting a Vector
- **Forward\_list and list**
  - i) Forward List in C++ STL
  - ii) List in C++ STL
  - iii) Problems(With Video Solutions):
    - (1) Josephus Problem using List in STL
    - (2) Design a Data Structure with Insert/Replace/Print operations
  - iv) Practice Problems
    - (1) This track contains many practice problems for the users which are considered important and must-do as far as Data Structure and Algorithm is concerned.
- **Deque**
  - i) Introduction

- ii) Problems(With Video Solutions):
  - (1) Sliding Window Maximum
  - (2) Design a Data Structure with Min/Max operations in  $O(1)$  time
- iii) Practice Problems
  - (1) This track contains many practice problems for the users which are considered important and must-do as far as Data Structure and Algorithm is concerned.
- **Stack**
  - i) Introduction and Various Operations
    - (1) push()
    - (2) pop()
    - (3) top()
    - (4) size()
    - (5) empty()
  - ii) Problems(With Video Solutions):
    - (1) Reverse items using Stack
    - (2) Balanced Parenthesis
    - (3) Stock Span Problem
    - (4) Previous Greater Elements
    - (5) Next Greater Elements
  - iii) Practice Problems
    - (1) This track contains many practice problems for the users which are considered important and must-do as far as Data Structure and Algorithm is concerned.
- **Queue**
  - i) Introduction and Various Operations
    - (1) push()
    - (2) pop()
    - (3) front()
    - (4) back()
    - (5) empty()
    - (6) size()
  - ii) Problems(With Video Solutions):
    - (1) Reverse first K items in a Queue
  - iii) Practice Problems
    - (1) This track contains many practice problems for the users which are considered important and must-do as far as Data Structure and Algorithm is concerned.
- **Priority Queue**
  - i) Introduction and Various Operations
    - (1) push()

- (2) `pop()`
  - (3) `top()`
  - (4) `empty()`
  - (5) `size()`
  - (6) Creating Min Heap based Priority Queue
- ii) Problems(With Video Solutions):
  - (1) Sort an array using Priority Queue
  - (2) K Largest Elements in an array
  - (3) Buy maximum items with given money
  - (4) Find K most frequent elements
- iii) Practice Problems
  - (1) This track contains many practice problems for the users which are considered important and must-do as far as Data Structure and Algorithm is concerned.
- **Set & MultiSet**
  - i) Set in C++ STL
    - (1) Introduction and Implementation
    - (2) `insert()`
    - (3) `begin()`
    - (4) `end()`
    - (5) `rbegin()`
    - (6) `rend()`
    - (7) `erase()`
    - (8) `clear()`
    - (9) `find()`
    - (10) Internal Working
    - (11) Time Complexities
  - ii) Problems on Set(With Video Solutions):
    - (1) Design a Data Structure that supports the below operations:
    - (2) `insert()`
    - (3) `delete()`
    - (4) `search()`
    - (5) `getFloor()`
    - (6) `getCeiling()`
  - iii) Multiset in C++ STL with few operations
  - iv) Practice Problems
    - (1) This track contains many practice problems for the users which are considered important and must-do as far as Data Structure and Algorithm is concerned.
- **Map and MultiMap**
  - i) Introduction to Map

- (1) insert()
  - (2) operator()
  - (3) size()
  - (4) empty()
  - (5) clear()
  - (6) begin()
  - (7) end()
  - (8) Internal Working
  - (9) Time Complexities
- ii) Problem:
  - (1) Design a data structure for item prices. The operations are add(), find(), findGreater(), findSmaller() and printSorted()
  - (2) Count greater elements for every array element.
- iii) Multimap in C++ STL with few functional operations
- iv) Problem(With Video Solutions):
  - (1) Design a data structure for prices with duplicates allowed. The operations are add(), find(), findGreater(), findSmaller() and printSorted
- v) Practice Problems
  - (1) This track contains many practice problems for the users which are considered important and must-do as far as Data Structure and Algorithm is concerned.
- **Unordered\_set**
  - i) Introduction to Set
    - (1) insert()
    - (2) begin()
    - (3) size()
    - (4) end()
    - (5) clear()
    - (6) find()
    - (7) Internal Working
    - (8) Time Complexities
  - ii) Problems(With Video Solutions):
    - (1) Print Unique Elements of Array
    - (2) Print duplicate elements of the array
  - iii) Practice Problems
    - (1) This track contains many practice problems for the users which are considered important and must-do as far as Data Structure and Algorithm is concerned.
- **Unordered\_Map**
  - i) Introduction
  - ii) Problems(With Video Solutions):



- (1) Design a DS for storing user balance
    - (2) Find Winner of Election
  - iii) Practice Problems
    - (1) This track contains many practice problems for the users which are considered important and must-do as far as Data Structure and Algorithm is concerned.
- o **Non Mutating STL Algorithms**
  - i) Explanation along with Time Complexities of
    - (1) max\_element()
    - (2) min\_element()
    - (3) accumulate()
    - (4) count()
    - (5) find()
    - (6) binary\_search()
    - (7) lower\_bound()
    - (8) upper\_bound()
    - (9) rotate()
    - (10) fill()
    - (11) is\_permutation()
    - (12) rand()
  - ii) Practice Problems
    - (1) This track contains many practice problems for the users which are considered important and must-do as far as Data Structure and Algorithm is concerned.
- o **Mutating STL Algorithm**
  - i) Explanation along with Time Complexities of
    - (1) sort()
    - (2) reverse()
    - (3) next\_permutation()
    - (4) prev\_permutation()
    - (5) make\_heap()
    - (6) merge()
  - ii) Problems(With Video Solutions):
    - (1) The Thief problem
    - (2) Fractional knapsack problem
    - (3) Chocolate Distribution problem
    - (4) Sort array elements by frequency
  - iii) Practice Problems
    - (1) This track contains many practice problems for the users which are considered important and must-do as far as Data Structure and Algorithm is concerned.

## Java Collections

- **Collection Overview**
  - i) Introduction to Java Collections Framework
  - ii) Collections hierarchy
  - iii) Generics
  - iv) Wildcards
  - v) toArray() Methods
  - vi) Collections Interface
  - vii) Iterators
  - viii) Collections Bulk operations
  - ix) Iterating through Collections
- **Java Lambda Expressions**
  - i) Introduction to Lambda Expressions and ways to use them
  - ii) Introduction to Method References and examples
  - iii) Syntax of Lambda Expressions
  - iv) Practice Problems
    - (1) Practice problems on Lambda Expressions
- **Java Streams**
  - i) Introduction to Streams in Java
  - ii) Various Applications of Streams
  - iii) The Stream hierarchy and methods
  - iv) Examples on Streams
  - v) Practice Problems
    - (1) Practice problems on Streams
- **ArrayList**
  - i) Introduction to List Interface
  - ii) Using List Iterator
  - iii) Introduction to ArrayLists
  - iv) Implementation
  - v) ArrayList Methods
  - vi) Traversal
  - vii) Problems with video explanation
    - (1) List of smaller elements
  - viii) Practice Problems
    - (1) Practice problems on implementation, iterator, methods, and using ArrayList to solve dsa problems
- **Linked List**
  - i) Introduction and implementation of LinkedList in Java
  - ii) Problems with video explanation

- (1) Josephus Problem using LinkedList
    - (2) Design a DS for remove and print
  - iii) Practice Problems
    - (1) Practice problems on implementation, traversal, and use of LinkedList,
- o **Stack**
  - i) Introduction to Stack
  - ii) Implementation
  - iii) Methods
  - iv) Traversal
  - v) Problems with video explanation
    - (1) Reverse order of items
    - (2) Check for balanced parentheses
    - (3) Stock span
    - (4) Previous greater element
    - (5) Next greater element
  - vi) Practice Problems
    - (1) Practice problems on implementation, methods, and using Stacks to solve dsa problems
- o **Queue**
  - i) Introduction to Queue Interface
  - ii) Implementation and usage
  - iii) Methods
  - iv) Traversal
  - v) Problems with video explanation
    - (1) Reverse first k items
  - vi) Practice Problems
    - (1) Practice problems on implementation, methods, and using Queue to solve dsa problems
- o **Deque**
  - i) Introduction to Deque
  - ii) Implementation and usage
  - iii) ArrayDeque
  - iv) Methods
  - v) Traversal
  - vi) Practice Problems
    - (1) Practice problems on implementation, methods, and using ArrayDeque to solve dsa problems
- o **PriorityQueue**
  - i) Introduction to PriorityQueue
  - ii) Implementation and usage
  - iii) Methods

- iv) Traversal
- v) Problems with video explanation
  - (1) Purchasing maximum items
  - (2) K largest elements
  - (3) Find k most frequent
  - (4) Find k most frequent in Linear time
- vi) Practice Problems
  - (1) Practice problems on implementation, methods, and using PriorityQueue to solve dsa problems
- **HashSet and LinkedHashSet**
  - i) Introduction to HashSet
  - ii) Introduction to LinkedHashSet
  - iii) Implementation and usage
  - iv) Methods
  - v) Traversal
  - vi) Problems with video explanation
    - (1) Print distinct elements
    - (2) Print repeating elements
  - vii) Practice Problems
    - (1) Practice problems on implementation, methods, and using HashSet to solve dsa problems
- **TreeSet**
  - i) Introduction to TreeSet
  - ii) Implementation and usage
  - iii) Methods
  - iv) Traversal
  - v) Problems with video explanation
    - (1) Ceiling on right
    - (2) Count greater element
  - vi) Practice Problems
    - (1) Practice problems on implementation, methods, and using TreeSet to solve dsa problems
- **HashMap and LinkedHashMap**
  - i) Introduction to HashMap
  - ii) Introduction to LinkedHashMap
  - iii) Implementation and usage
  - iv) Methods
  - v) Traversal
  - vi) Problems with video explanation
    - (1) DS for balance
    - (2) Print frequencies in order
  - vii) Practice Problems

- (1) Practice problems on implementation, methods, and using HashMap to solve dsa problems
- **TreeMap**
  - i) Introduction to TreeMap
  - ii) Implementation and usage
  - iii) Methods
  - iv) Traversal
  - v) Problems with video explanation
    - (1) Design a data structure for item prices
    - (2) Design a data structure for item prices with duplicates allowed
  - vi) Practice Problems
    - (1) Practice problems on implementation, methods, and using TreeMap to solve dsa problems
- **String**
  - i) Introduction to Strings
  - ii) Introduction to StringBuilder and StringBuffer
  - iii) Implementation and usage
  - iv) Methods
  - v) Traversal
  - vi) Problems with video explanation
    - (1) Pangram checking
    - (2) Pattern searching
    - (3) Find one extra character
  - vii) Practice Problems
    - (1) Practice problems on implementation, methods, and using Strings to solve dsa problems
- **Comparator and Comparable**
  - i) Introduction to Comparable Interface
  - ii) Introduction to Comparator Interface
  - iii) Methods of Comparator Interface and Examples on it
  - iv) Practice Problems
    - (1) Practice problems on using Comparator to sort effectively
- **Arrays Class**
  - i) Introduction to Arrays and the Arrays Class
  - ii) Implementation and usage
  - iii) Methods like
    - (1) fill()
    - (2) BinarySearch()
    - (3) equals()
    - (4) mismatch()
    - (5) compare()

- (6) `asList()`
    - (7) `toString()`
  - iv) Traversal
  - v) Practice Problems
    - (1) Practice problems on implementation and methods
- **Collections Class**
  - i) Introduction to Collections Class
  - ii) Methods like `fill()`, `reverse()`, `binarySearch()`, `max()`, `min()`, `frequency()`
  - iii) Practice Problems
    - (1) Practice problems on methods
- **Sorting**
  - i) Introduction to sorting in Java
  - ii) `Arrays.sort()`
  - iii) `Collections.sort()`
  - iv) Comparable Interface
  - v) Problems with video explanation
    - (1) The thief problem
    - (2) Chocolate distribution problem
    - (3) Keep indices after sorting
    - (4) Sort an array according to other
    - (5) Sort students by marks
    - (6) Sort elements by frequency
    - (7) Sort elements by frequency in Linear Time
  - vi) Practice Problems
    - (1) Practice problems on various sorting algorithms, and comparator sort

## 6) Data Structures ( Advanced )

- **Mathematics**
  - Count Digits
  - Palindrome Numbers
  - Factorial of Numbers
  - GCD of Two Numbers
  - LCM of Two Numbers
  - Check for Prime
  - Prime Factors
  - Sieve of Eratosthenes
  - Computing Power

- **Bit Magic**
  - Bitwise Operators in CPP(Part 1)
  - Bitwise Operators in CPP(Part 2)
  - Bitwise Operators in JAVA(Part 1)
  - Bitwise Operators in JAVA(Part 2)
  - Bitwise Operators in JAVA(Part 3)
  - Check Kth bit is set or not
  - Count set bits
  - Power of Two
  - One Odd Occurring
  - Two Odd Occurring
  - Power Set using Bitwise
- **Recursion**
  - Josephus Problem
  - Subset Sum Problem
- **Arrays:**
  - Kadane's Algorithm
  - Shuffling Algorithms
  - Sliding Window
  - Prefix Sum Technique
  - Video Solutions for some standard and complex problems
  - More Problems for Practice.
- **Matrix:**
  - Multidimensional Array in CPP and Java
  - Search, Transpose and Rotate
  - Pattern Traversal: Snake, Spiral, Boundary
  - Video Solutions for some standard and complex problems
  - More Problems for Practice.
- **Searching:**
  - Two Pointer Approach
  - Video Solutions for some standard and complex problems
  - More Problems for Practice.
- **Sorting:**
  - Union And Intersection of Sorted Arrays
  - Inversions Count
  - Tail Call elimination Quick Sort
  - Cycle Sort
  - Merge of Overlapping Intervals
  - Overview of Sorting Algorithms
  - Video Solutions for some standard and complex problems
  - More Problems for Practice.

- **Hashing:**
  - Double Hashing
  - Find frequencies of array
  - Count Distinct element in Every Window
  - Intersection and Union via Hashing
  - Frequencies of Array Elements
  - Distinct Elements in Window
  - Counting Occurrences
  - Check for a Pair with given Sum
  - Longest Consecutive Subsequence
  - Subsequence Problems
  - Subarray Problems
  - Video Solutions for some standard and complex problems
  - More Problems for Practice.
- **Strings:**
  - Creation, Updation
  - Reverse, Pangram, Case conversion
  - Validation, Length
  - Palindrome Check
  - Overview of Pattern Searching
  - Pattern Matching Algorithms:
    - Rabin Karp Algorithm
    - KMP Algorithm
  - Rotations Check of two Strings
  - Anagram
  - Video Solutions for some standard and complex problems
  - More Problems for Practice.
- **Linked List:**
  - Doubly Linked List
  - Circular Linked List
  - Loop in Linked List (Detection and Removal)
  - Loop Detection Algorithms
  - Union and Intersection of LinkedLists
  - Reverse in Groups
  - LRU Cache Design
  - Palindrome LinkedList
  - Video Solutions for some standard and complex problems
  - More Problems for Practice.
- **Stack:**
  - Infix, Postfix, Prefix (Introduction)
  - Infix to PostFix (Simple Solution)
  - Infix to PostFix (Efficient Solution)
  - Evaluation of Postfix
  - Infix to Prefix (Simple Solution)



- Infix to Postfix (Efficient Solution)
  - Evaluation of Prefix
  - Implementing Two Stacks in Single Array
  - Implementing K stacks in Single Array
  - Largest Rectangular Area in Histogram
  - Design a Stack that supports getMin() operation
  - Video Solutions for some standard and complex problems
  - More Problems for Practice.
- **Queue and Deque:**
  - Stack using Queue
  - Reversal
  - Maximum of all Subarrays of Size K
  - Generate numbers using given digits
  - Design a data structure with min/max operations
  - Video Solutions for some standard and complex problems
  - More Problems for Practice.
- **Tree:**
  - Line By Line Level Order Traversal
  - Printing Left, Right, Top and Bottom Views
  - Binary Tree to Doubly Linked List
  - Binary Tree from Inorder and Postorder Traversal
  - Maximum Width
  - Child Sum Property
  - Convert Binary Tree to Doubly LinkedList
  - Burning a Tree from Leaf
  - Diameter
  - LCA
  - Serialize and Deserialize
  - Count Nodes in Complete Binary Tree
  - Video Solutions for some standard and complex problems
  - More Problems for Practice.
- **Binary Search Tree:**
  - Top View
  - Bottom View
  - Vertical Sum
  - Vertical Traversal
  - Fix BST With Two Nodes Swapped
  - Check For BST
  - Video Solutions for some standard and complex problems
  - More Problems for Practice.
- **Heap:**
  - Heap Sort
  - Video Solutions for some standard and complex problems
  - More Problems for Practice.

- **Graph:**
  - Graph Representation: Adjacency List
  - Adjacency List Implementation in CPP
  - Adjacency List Implementation in Java
  - Adjacency List and Matrix Comparison
  - Breadth First Search and application
  - Depth First Search and application
  - Detect Cycle in Undirected Graph
  - Detect Cycle in Directed Graph
  - Topological Sorting
  - Shortest Path Problems
  - Prim's Algorithm Introduction and Implementation in CPP and Java
  - Dijkstra's Algorithm Introduction and Implementation in CPP and Java
  - Bellman Ford Algorithm
  - Kosaraju's Algorithm
  - Articulation Point
  - Bridges in Graph
  - Tarjan's Algorithm
  - Video Solutions for some standard and complex problems
  - More Problems for Practice.
- **Greedy Algorithm:**
  - Introduction
  - Activity Selection Problem in CPP and Java
  - Fractional Knapsack in CPP and Java
  - Job Sequencing Problem
  - Huffman Coding
  - Video Solutions for some standard and complex problems
  - More Problems for Practice.
- **BackTracking:**
  - Concept of Backtracking
  - Problems: Rat In Maze, N Queen, Sudoku
  - More Problems for Practice.
- **Dynamic Programming:**
  - Introduction
  - Memoization
  - Tabulation
  - LCS and its variations
  - Coin Change
  - KnapSack
  - LIS and its variations
  - Egg Drop Puzzle
  - Subset Sum
  - Matrix Chain Multiplication
  - Palindrome Partitioning

- Video Solutions for some standard and complex problems
  - More Problems for Practice.
- **Trie:**
  - Introduction
  - Insert, Search, Delete
  - Video Solutions for some standard and complex problems
  - More Problems for Practice.
- **Segment Tree:**
  - Introduction
  - Construction
  - Range and Update Query
  - More Problems for Practice.
- **Disjoint-Set**
  - Introduction
  - Union-Find
  - Union By Rank
  - Path Compression
  - Kruskal's Algorithm
  - More Problems for Practice

## 7) Object Oriented Analysis and Design

### Object oriented Analysis and Design Concepts

- Introduction to Object and Classes.
- Software Development Process.
- UML and its importance.
- Class Diagrams & Object Diagrams
- Use-case Diagrams

### Object-oriented Analysis and Design Case Studies: Complete step by step design and analysis of below case studies.

- BookMyShow : Movie ticket booking application.
- MyFlipCart : Complete e-commerce application.
- ParkingLot : Automated Solution for Parking-Lots.
- BlackJack : Most popular card game in casinos.

## 8) CS Subjects

- **Operating System**
- Operating System and its Types
- Multiprogramming, Multiprocessing, Multithreading
- Process Management and Scheduling
- Process Synchronization.
- Deadlock
- Memory Management
- **Database Management System**
- Introduction to DBMS
- Architectures
- ER Model
- Relational Model
- Keys in Relational Model
- Database Normalization
- Normal Forms
- Concurrency Control
- Indexing in Database
- B+ Tree Introduction
- SQL
- **Computer Networks:**
- Introduction to Computer Networks
- TCP/IP vs OSI Model
- Circuit Switching vs Packet Switching
- Flow Control Protocols
- IP and Classful Addressing
- Classless Addressing
- Routing Protocols
- ARP & DHCP
- Transport Layer
- TCP & UDP
- Application Layer
- **Subject Wise Most Asked Interview Questions**
- Virtual Memory

## 9) Aptitude and Reasoning

### QUANTITATIVE ANALYSIS

- **Number System** - Numbers, Prime & Composite Numbers, Co-Prime numbers, ....
- **Divisibility Test** - Divisibility, Factor, Prime Factor, Divisibility Rules(2, 3, 4, ...., 10, 11)

- **HCF and LCM** - Listing Multiples, Prime Factorization, Division method, etc.
- **Decimals Fractions** - Fractions, Decimals, Decimal Fractions, Recurring Decimals.
- **Squares & Cubes** - Square, Cube, Square Root, Cube Root
- **Average** - Mean, Median and Mode
- **Age** - Various techniques to solve age problems.
- **Log** - Log Function, Common Log, Natural Log, Binary Log, Laws of Logarithms.
- **Percentage** - Percentage, Fractions of Percentages, Expenditure, Price, Consumption, Population, Depreciation, ...
- **Profit, Loss & Discount** - CP, SP, MP, Profit, Loss, Discount, ...
- **Ratio And Proportion** - Ratio, Proportion, Compounded Ratio, Mean Proportional, Componendo, Dividendo, Directly Proportional, Inversely Proportional.
- **Partnership** - Various types of Partnership and Partners.
- **Pipe and Cistern | Part 1**
- **Pipe and Cistern | Part 2**
- **Time And Work** - Problems on Time, Work and Efficiency.
- **Work and Wages | Part 1**
- **Work and Wages | Part 2**
- **Speed, Distance and Time | Part 1**
- **Speed, Distance and Time | Part 2**
- **Boats and Streams** - Downstream, Upstream, Average Speed, ...
- **Trains** - Problems in same and opposite Direction.
- **Simple Interest**
- **Compound Interest | Part 1**
- **Compound Interest | Part 2**
- **Area** - Rectangle, Square, Triangle etc.
- **Volume** - Cube, Cuboid, Cylinder, Cone, Sphere, Hemisphere,
- **Race** - Race, Winner, Dead Heat Race, etc.
- **Clocks** - Problems related to angle between hands.
- **Calendars** - Day, Week, Month, Year, Leap Year, Non-Leap year, Odd days etc.
- **Height Distance** - Heights, Height, Distance, Angle of Elevation, Depression, Trigonometry Ratio, Conversion
- **Series And Sequence** - AP, GP, HP.

## LOGICAL and VERBAL REASONING

- **LOGICAL REASONING** -
  - Introduction,
  - Data Sufficiency,
  - Data Interpretation,
  - Blood Relations,
  - Sequence and Series,

- Direction Test,
  - Mathematical Operations,
  - Syllogism.
- **VERBAL APTITUDE -**
  - Verbal Ability
  - Reading Comprehension
  - Vocabulary Section
  - Vocabulary Reasoning Section
- **BASICS OF GRAMMAR 1 -**
  - Section
  - Clause
  - Phrase
  - Parts of Speech
  - Nouns
  - Gerunds
  - Pronouns
  - Verbs
  - Adjectives.
  - Adverbs
- **BASICS OF GRAMMAR 2 -**
  - Prepositions
  - Conjunctions
  - Subordinating Conjunctions
  - Tenses
  - Interjections
- **ARTICLE -**
- **ACTIVE VOICE & PASSIVE VOICE -**
  - Use with Tenses
- **CLOSET TESTS -**
  - Problem Solving
- **PASSAGE FORMATION -**
  - Problem Solving
- **SENTENCE FORMATION -**
  - Problem Solving
- **SENTENCE COMPLETION-**
  - Problem Solving
- **SUBJECT VERB and AGREEMENT -**
  - General Rule
  - Multiple Subjects
  - Inverted Sentences
  - There is & There are
  - Collective Nouns
  - Or and Nor
  - Indefinite Pronouns

- Number Of and Percentage Of
- **DETERMINERS**
  - Demonstration and Use
- **MODIFIERS**
  - General Rules
  - Problem Solving
  - Dangling Modifiers
- **PARALLEL STRUCTURE**
  - General Rules
  - Problems with Articles, Infinitives, and Prepositions.
  - Conjunction Pairs
  - Comparing and Contrasting
- **GRAMMAR EXERCISE -**
  - Subject-Verb Agreement
  - Pronouns
  - Verbs
  - Parallel Structure
  - Modifiers
  - Adjectives and Adverbs
- **ERROR SPOTTING**
  - Types of Errors
  - Problem Solving
- **PARAJUMBLES**
  - Problem Solving
- **VERBAL ANALOGIES**
  - Problem Solving