# **Module - 1**

**Syllabus: -**

* **Algorithm Analysis:** Time and space complexity. Asymptotic Notations and their significance. Asymptotic Analysis. Finding time complexity of well-known algorithms like-insertion sort, heapsort, Asymptotic solution to recurrences, Substitution Method, Recursion Tree, Master Theorem.
* **Divide-and-Conquer Method:** Basic Principle, Binary Search – Worst-case and Average Case Analysis, Merge Sort – Time Complexity Analysis, quicksort – Worst-case and Average Case Analysis, Concept of Randomized Quicksort.
* **Medians and Order Statistics**
* **Lower Bound Theory:** Bounds on sorting and searching techniques.