

**SARDAR PATEL UNIVERSITY**  
**Programme: MCA**  
**Semester: III**  
**Syllabus with effect from: June 2014**

<b>Paper Code:</b> PS03CMCA04	<b>Total Credit: 4</b>
<b>Title Of Paper:</b> Analysis and Design of Algorithms	

<b>Unit</b>	<b>Description in detail</b>	<b>Weighting (%)</b>
<b>1</b>	<b>Review of Data Structures</b> Such as stacks, queues, linked lists, trees, graphs, heaps and sets along with important operations on it Concepts in algorithm analysis, asymptotic complexity	
<b>2</b>	<b>Divide and Conquer</b> The general method Binary search, Finding maximum, minimum Merge sort, Quick sort Strassen's matrix multiplication	
<b>3</b>	<b>Greedy method</b> General method Optimal storage in tape, Knap sack Job sequencing with deadlines Spanning trees, Shortest paths	
<b>4</b>	<b>Dynamic Programming.</b> General method Multistage graphs Optimal binary search trees 0/1 knapstack, Travelling salesman problem	
<b>5</b>	<b>Backtracking</b> General method 8 queens problems, Graph colouring Hamiltonian cycles	
<b>6</b>	<b>Branch &amp; Bound</b> The method, LC Search, 15 puzzle Travelling salesman algorithm using branch & bound techniques	

**Basic Text & Reference Books**

- Horowitz, Ellis & Sahni, Sartaj : Fundamental of data structures, computer science Press ,Potomac maryland, 1976.
- Horowitz Ellis & Sahni Sartaj : Fundamentals of Computer Algorithms, Galgotia Pub. Pvt. Ltd., New Delhi, 1993.
- Goodman, S. E. & Hedetniemi, : Introduction to the Design and Analysis of Algorithms, McGraw-Hill Book Comp., 1977.
- Kunth. D. E. : Fundamentals of Algorithms : The Art of Computer Programming Vol. 1, Narosa Pub. House, 1985.
- Aho, A. V., Hopcroft, J. E., Ullman J. D. : The Design and Analysis of Computer Algorithms, Addison-Wesley Pub. Co., 1974.

