**SHAMBHUNATH INSTITUTE OF ENGINEERING & TECHNOLOGY JHALWA ALLAHABAD, UP, INDIA – 211012**

**LECTURE BLOW\_UP**

**DESIGN AND ANALYSIS OF ALGORITHMS**

B. Tech. 5th Semester

Computer Science & Engineering

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| **UNIT-1** | **TOPIC** | **LECT.** | **REFE.** |
| Introduction to Design and analysis of algorithms | L1 | R1 |
| Complexity of algorithm | L2 | R1 |
| Time complexity of Pseudo code | L3 | R1 |
| Asymptotic notations | L4 | R1 |
| Growth of Functions | L5 | R1 |
| Master Method | L6 | R1 |
| Recurrences, Solution of Recurrences by substitution | L7 | R1 |
| Recursion tree method | L8 | R1 |
| Iteration method | L9 | R1 |
| Quick sort & implementation | L10 | R1 |
| Analysis of quick sort | L11 | R1 |
| Heap , Heapify | L12 | R1 |
| Heap sort | L13 | R1 |
| Comparison of Sorting algorithm | L14 | R1 |
| Linear time sorting ,counting sort | L15 | R1 |
| Redix & Bucket sort, Revison | L16 | R1 |
| **UNIT-2** | Tries and Skip list, | L17 |  |
| Advanced Data Structure | L18 | R1,R2 |
| R-B Tree , its properties, Rotation | L19 | R1,R2 |
| R-B Tree Insertion & Deletion | L20 | R1,R2 |
| R-B Tree Example | L21 | R1,R2 |
| B-Tree ,its properties, Derivation | L22 | R1 |
| B-Tree Insertion & Deletion | L23 | R1 |
| B-Tree Example | L24 | R1 |
| Binomial Heap ,Representation, properties | L25 | R1 |
| Binomial Heap Operation | L26 | R1 |
| Binomial Heap as priority Queue | L27 | R1 |
| Fibonacci Heap ,Representation, properties | L28 | R1 |
| Fibonacci Heap Operation | L29 | R1 |
| Fibonacci Heap Application (Consolidation) | L30 | R1 |
| Revision | L31 |  |
| **UNIT-3** | Divide & Conquer With Matrix Multiplication | L32 | R2 |
| Divide & Conquer With Binary Searching | L33 | R2 |
|  | Divide & Conquer With Convex Hull | L34 | R2 |
| Greedy Methods , Properties | L35 | R1 |
| Activity Selection Problem | L36 | R1 |
| Knapsack , Huffman Codes | L37 | R1 |
| Minimum Spanning Tree , Prim’s Algorithm | L38 | R1 |
| Kruskal’ algorithms | L39 | R1 |
| Shortest Path Problem , Dijkstra’algorithm | L40 | R1 |
| Bellman Ford Algorithms | L41 | R1 |
| **UNIT-4** | Dynamic Programming ,properties ,Knapsack(0-1) | L42 | R1 |
| Longest Common Subsequence | L43 | R1 |
| Matrix Chain Multiplication | L44 | R1 |
| All Pair Shortest Path Problem ,Warshal’ & Floyd Algo. | L45 | R1 |
| Back tracking , Branch & Bound Technique | L46 | R2 |
| Graph Coloring, n-Queen | L47 | R2 |
| Hamiltonion Cycle & Sum of Subset Problem | L48 | R2 |
| Trevelling Salesman Problem | L49 | R2 |
| **UNIT-5** | String Matching , Simple Naïve & Rabin Karp Algorithm | L50 | R1 |
| Numerical Upon Rabin Karp algorithm | L51 | R1 |
| KMP Algorithm & Prefix Function | L52 | R1 |
| BM Moore Algorithm & Last Function | L53 | R1 |
| Finite Automaton Matcher | L54 | R1 |
| Approximation Algorithms | L55 | R1 |
| APPROX - Vertex Cover & TSP | L56 | R1 |
| Randomized Algorithm | L57 | R1 |
| Discrete Fourier Transform | L58 | R2 |
| Fast Fourier Transform | L59 | R2 |
| NP-Completeness | L60 | R1 |
| Polynomial time verification | L61 | R1 |
| NP-Complete Problems (without proofs) | L62 | R1 |
|  | **Revision Of all 5 th unit** | L63 |  |
| L64 |
| L65 |
| L66 |
| L67 |
| **References:**  **1: Thomas H.Coreman, Charles E. Leiserson and Ronald L. Rivest ,“Introduction To Algorithms “**  **2: E. Horowitz & S Sahni,” Fundamentals of Computer Algorithms”** | | | |