**GANPAT UNIVERSITY**

**U.V. PATEL COLLEGE OF ENGINEERING**

**B. TECH-CE/IT/CE-AI (SEM IV)**

**DESIGN AND ANALYSIS OF ALGORITHMS**

**ASSIGNMENT-1**

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| Q.1 | What is space complexity? Discuss various factors affecting it. Write iterative and recursive algorithms for finding factorial of a given number and find its space and time complexity. |
| Q.2 | Find out the step count for the following functions using tabular method.   |  |  | | --- | --- | | void ABC( int n )  {  for( int i=1; i<= n; i++){  for (int j=1; j<=n;j=j\*2) {  printf(“%d”,j);  }  }  } | void Example2 (int n){  int a = 0;  for (int i = 0; i < N; i++) {  for (int j = N; j > i; j--) {  a = a + i + j;  }  }  } | |
| Q.3 | Arrange the following growth functions in increasing order of growth:  O(n1.5), O(2n), O (nlogn), O(logn), O(n3), O() |
| Q.4 | Prove weather following statements are true or false.   1. 7n3+n2 ≠ Ω(n4) 2. 9n + 3 = O(n2) 3. 2n + n3 + 1 = Ө(n3) |
| Q.5 | Solve the following recursive equation and find the time complexity.  Tn=T(n-1)+n, T(0)=1 |
| Q.6 | Explain the Backtracking and its Application & Advantage and Disadvantages. Illustrate 8X8 Queen problem. |
| Q.7 | Solve the following using greedy knapsack strategy.  Bag Capacity: 15   |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | Objects | 1 | 2 | 3 | 4 | 5 | 6 | 7 | | Profit (P) | 5 | 10 | 15 | 7 | 8 | 9 | 4 | | Weight(w) | 1 | 3 | 5 | 4 | 1 | 3 | 2 | |
| Q.8 | Write down the algorithm for DFS and BFS. Compute the DFS order for the graph given below: |
| Q.9 | Let us consider a set of given jobs as shown in the following table. We have to find a sequence of jobs, which will be completed within their deadlines and will give maximum profit. Each job is associated with a deadline and profit. |
| Q.10 | Define the following Term regarding to Graph.   1. Regular Graph 2. Complete Graph 3. Connected Graph 4. Planner Graph 5. Bi-partite Graph 6. Complete Bi-partite Graph 7. Cyclic Graph |
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**NOTE: Last date of assignment submission is 06.03.2023.**