

**MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)**

**II B.Tech II Semester (MR21- 2021-22 Batch) I Mid Term Examinations-I, 2023**

Branch: **CSE**  Time: **90 Mins**

Subject: Design and Analysis of Algorithms

**Answer ALL the Questions**

**Name of the Faculty: Dr. S.Sandhya Rani,**

**Mr. P V Ramana, Ms Asmitha p Ambekar**

**MODULE-I**

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| **S No** | **Questions** | **Marks** | **Blooms Taxonomy Level** | **co** |
| **1** | Define the algorithms and its characteristics? | **5** | L1 | **1** |
| **2** | Explain Performance of analysis ,Compare time complexity with space complexity with examples | **5** | L1 | **1** |
| **3** | Discuss Importance of Asymptotic notations and its types with Diagrams? | **5** | L3 | **1** |
| **4** | Describe about the term I) Connected Components  II) Bi Connected Components with example | **5** | L1 | **1** |
| **5** | Summarize disjoint set operations and its algorithms with example | **5** | L1 | **1** |
| **6** | What is the time complexity of following function fun ()? Explain  int fun(int n)  {  for (int i = 1; i <= n; i++)  {  for (int j = 1; j < n; j += i)  {  Sum = Sum +i\*j;  }  }  return(Sum);  } | **5** | L3 | **1** |
| **7** | Discuss About Pseudo code for expressing an Algorithm? | **5** | L3 | **1** |
| **8** | Describe about Amortized Analysis? | **5** | L1 | **1** |

**MODULE-II**

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| **S No** | **Questions** | **Marks** | **Blooms Taxonomy Level** | **co** |
| **1** | Derive the time complexity of Divide and Conquer Method | **5** | L2 | **2** |
| **2** | Write Quick sort algorithm and analyse the algorithm for time complexity with example 65,60,70,45,50,90,85,80. | **5** | L3 | **2** |
| **3** | Write Merge sort algorithm and analyse time complexity of the algorithm | **5** | L2 | **2** |
| **4** | Explain a job Sequence with dead lines n=4(no of jobs) Jobs Prices(P1,P2,P3,P4)={100,10,15,27} and Dead Lines{d1,d2,d3,d4}={2,1,2,1}. | **5** | L1 | 2 |
| **5** | Solve the following instance of 0/1 Knapsack problem using Greedy method, Capacity (W) = 5.   |  |  |  | | --- | --- | --- | | **Item** | **Weight** | **Value($)** | | 1 | 2 | 12 | | 2 | 1 | 10 | | 3 | 3 | 20 | | 4 | 2 | 15 | | **5** | L3 | 2 |
| **6** | Explain differences between Prim’s and Kruskal’s Minimum spanning Tree algorithm. Derive the time complexity of Kruskal’s algorithm. | **5** | L1 | 2 |
| **7** | Solve the Minimum cost spanning tree of Kruskal’s algorithm.. | **5** | L2 | **2** |
| **8** | Solve the Minimum cost spanning tree of Prim’s algorithm | **5** | L2 | **2** |

**MODULE – III**

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| **S No** | **Questions** | **Marks** | **Blooms Taxonomy Level** | **co** |
| **1** | Categorize how Matrix – chain Multiplication problem can be solved using dynamic programming techniques, with suitable example. | 5 | L2 | 3 |
| **2** | Compare Greedy Method and Dynamic Programming techniques | **5** | L1 | 3 |
| **3** | Solve the following instance of 0/1 Knapsack problem using Dynamic Programming, Capacity (W) = 5.   |  |  |  | | --- | --- | --- | | **Item** | **Weight** | **Value($)** | | 1 | 2 | 12 | | 2 | 1 | 10 | | 3 | 3 | 20 | | 4 | 2 | 15 | | **5** | L3 | 3 |
| **4** | Describe the general methodology of Dynamic programming techniques. | **5** | L1 | 3 |

**Prepared By Name: HOD Signature**

**Signature:**