|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Course Code:** | | | **CST-314** |  | | | |
| **V Semester B.E. Computer Science and Engineering Test – I Examination**  **Design and Analysis of Algorithms [SHIFT-I]** | | | | | | | |
| Time: 1 Hours] | | | | [Max. Marks: 15 | | | |
| **All questions carry marks as indicate**  **Check the internal choices in each question** | | | | | | | |
| **Question** | | **Description of Question** | | | **Marks** | **CO** | **EO** |
|  | | **Solve Any one** | | |  |  |  |
| **1** | **(a)** | Write Prim’s Algorithm using suitable data structure. Apply the algorithm on following graph and generate the contents of intermediate data structures **[near**]. Comment on parallelization of Prim’s algorithm. | | | 05 | CO2 | L1, L3 |
| **1** | **(a)** | Implement Knapsack algorithm on the following set of data. N=7, Capacity=15. Write algorithm and solve for profit/wt ratio method. Write any one application of knapsack problem.   |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | Obj | 1 | 2 | 3 | 4 | 5 | 6 | 7 | | Pr | 10 | 14 | 7 | 12 | 4 | 15 | 6 | | Wt | 3 | 2 | 4 | 1 | 3 | 2 | 3 | | | | 05 | CO2 | L2 |
|  |  | **Solve Any one** | | |  |  |  |
| **2** | **(a)** | Apply Divide and Conquer principle on following array and construct the MIN-MAX tree. Analyze the depth of recursion and stack size required to execute the algorithm. Comment on depth of recursion and stack size required for implementation.  [-20, 56, 84, 8, 90, 125, -19, 4, -45, 67, 156] | | | 04 | CO2 | L3, L4 |
| **2** | **(a)** | Select the set of 15 points and implement closest pair algorithm. Demonstrate the concept of finding closest pair of point across the band. | | | 04 | CO2 | L2 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Course Code:** | | | **CST-314** |  | | | |
| **V Semester B.E. Computer Science and Engineering Test – I Examination**  **Design and Analysis of Algorithms [SHIFT-I]** | | | | | | | |
| Time: 1 Hours] | | | | [Max. Marks: 15 | | | |
| **All questions carry marks as indicate**  **Check the internal choices in each question** | | | | | | | |
| **Question** | | **Description of Question** | | | **Marks** | **CO** | **EO** |
|  | | **Solve any one** | | |  |  |  |
| **3** | **(a)** | Implement Multistage graph on following graph and compute the route between source and destination vertex. Write any two applications.  scan0003.jpg | | | 03 | CO3 | L1 |
|  | **(a)** | The automotive industry is using robot for assembly, which move around fixed set of points and returns back to start point. The distance matrix is as shown below. Devise a suitable formulation to complete the task in **maximum time**.   |  |  |  |  | | --- | --- | --- | --- | | 0 | 8 | 6 | 12 | | 5 | 0 | 5 | 9 | | 11 | 7 | 0 | 6 | | 10 | 4 | 9 | 0 | | | | 03 | CO3 | L3 |
| **Q.4** |  | **MCQ Questions** | | |  |  |  |
|  | **1** | Write the complexity equations of following sorting methods:  Quick Sort, Merge Sort, Binary Search, Ternary Search | | | 01 | CO2 | L2 |
|  | **2** | What is complexity equation of Kruskal algorithm | | | 01 | CO2 | L2 |
|  | **3** | What is complexity equation of Travelling Salesman problem, solved using dynamic programming | | | 01 | CO3 | L2 |