**III.B.TECH- I-SEM (R20)-II MID Examinations-December-2023 Date: 26.12.2023**

**Subject: Design And Analysis Of Algorithms Time: 10:00 TO 11:30 AM**

**Branch: CSE, IT, CSC, CSD, AIDS Marks: 25 M**

***Answer All Questions In Part-A& Part-B***

**PART-A 5 x 2 M = 10 M**

|  |  |  |
| --- | --- | --- |
|  |  | **CO** |
| **1.** | List the difference between back tracking and branch & bound. | **01** |
| **2.** | Describe Floyd-Warshall Algorithm. | **01** |
| **3.** | Define optimal binary search tree with example. | **02** |
| **4.** | Define Greedy method. | **02** |
| **5.** | Define Dijkstra Algorithm. | **02** |

**PART-B 3 x5 M = 15 M**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | |  | **CO** | |
| **6.** | | Write the algorithm to construct a spanning tree using Kruskal’s algorithm with an example. | **01** | |
|  | | **Or** |  | |
| **7.** | | Find Least Cost (LC) branch and bound of the following with given total weight of knapsack is 15 and number of items i.e. n=4.   |  |  |  |  |  | | --- | --- | --- | --- | --- | | **Profit** | 10 | 10 | 12 | 18 | | **Weight** | 2 | 4 | 6 | 9 | | **01** | |
| **8.** | | Explain Traveling sales person problem using Dynamic programming with an example.  . | **02** | |
|  | | **Or** |  | |
| **9.** | | Find the Reliability design for the following:   |  |  |  | | --- | --- | --- | | **Di** | **Ci** | **Ri** | | D1 | 30 | 0.9 | | D2 | 15 | 0.8 | | D3 | 20 | 0.5 |   Given budget is 105. | **02** | |
| **10.** | Single source shortest path for the following graph.  9  2  6  15  11  14  9  7  10 | | **03** |
|  | **Or** | |  |
| **11.** | a) State and prove Cook’s theorem.  b) What are NP-Hart and NP-complete? | | **03** |

**SCHEME OF EVALUATION**

**Part –A**

| **SNO** | **THEORY** | **MARKS** | **TOTAL** |
| --- | --- | --- | --- |
| **1** | List the difference between back tracking and branch & bound. | **2** | **2** |
| **2** | Describe Floyd-Warshall Algorithm. | **2** | **2** |
| **3** | Define optimal binary search tree with example. | **2** | **2** |
| **4** | Define Greedy method. | **2** | **2** |
| **5** | Define Dijkstra Algorithm. | **2** | **2** |

**Part –B**

| **SNO** | **THEORY** | **MARKS** | **TOTAL** |
| --- | --- | --- | --- |
| **6** | Write the algorithm to construct a spanning tree using Kruskal’s algorithm with an example.    (or) | **5** | **5** |
| **7** | Find Least Cost (LC) branch and bound of the following with given total weight of knapsack is 15 and number of items i.e. n=4.   |  |  |  |  |  | | --- | --- | --- | --- | --- | | **Profit** | 10 | 10 | 12 | 18 | | **Weight** | 2 | 4 | 6 | 9 | | **5** |  |
| **8** | Explain Traveling sales person problem using Dynamic programming with an example.    (or) | **5** | **5** |
| **9** | Find the Reliability design for the following:  Di Ci Ri  D1 30 0.9  D2 15 0.8  D3 20 0.5  Given budget is 105. | **5** |  |
| **10** | Single source shortest path for the following graph.    (or) | **5** | **5** |
| **11** | a) State and prove Cook’s theorem.  b) What are NP-Hart and NP-complete? | **2.5**  **2.5** |  |