

**III.B.TECH- I-SEM (R20)-I MID EXAMINATIONS-OCTOBER-2023 Date: 30.10.2023**

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

**Branch: CSE, IT, CSE (CS), CSE (DS), AIDS Marks: 25 M**

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

|  |  |  |
| --- | --- | --- |
|  |  | **CO** |
| **1.** | Write definitions of Time and Space Complexity. | **01** |
| **2.** | What do you understand by Algorithm and define its characteristics? | **01** |
| **3.** | Define the Backtracking, what are the problems over which this can be apply? | **02** |
| **4.** | What is cyclic graph? Give an example. | **02** |
| **5.** | What is Dynamic programming? | **02** |

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

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

|  |  |  |
| --- | --- | --- |
|  |  | **CO** |
| **6.** | Write Binary Search algorithm. Further, find number 64, from the list 6, 10, 45, 64, 70, 89, 92, 97, 99 using Binary Search algorithm? | **01** |
|  | **OR** |  |
| **7.** | What is Divide and Conquer technique? Explain with an example. | **01** |
| **8.** | Draw the state-space tree along with answer nodes for 4-queens problem.  . | **02** |
|  | **OR** |  |
| **9.** | What is sum-of-subsets problem? Find all possible solution for given elements whose weights are (w1,w2,w3,w4,w5)=(2,3,5,6,8,10) and m=10. Draw its State-Space Tree. | **02** |
| **10** | Write Graph coloring algorithm. Draw the state space tree for the following graph. | **03** |
|  | **OR** |  |
| **11.** | Solve the instance of 0/1 knapsack problem using Dynamic Programming given weights = {1,3,4,5} and profit = {1, 4, 5, 7} having Knapsack weight = 7 and n=4. | **03** |

**SCHEME OF EVALUATION**

**Part –A**

| **SNO** | **THEORY** | **MARKS** | **TOTAL** |
| --- | --- | --- | --- |
| **1** | Write definitions of Time and Space Complexity. | **2** | **2** |
| **2** | What do you understand by Algorithm and define its characteristics? | **2** | **2** |
| **3** | Define the Backtracking, what are the problems over which this can be apply? | **2** | **2** |
| **4** | What is cyclic graph? Give an example. | **2** | **2** |
| **5** | What is Dynamic programming? | **2** | **2** |

**Part –B**

| **SNO** | **THEORY** | **MARKS** | **TOTAL** |
| --- | --- | --- | --- |
| **6** | Write Binary Search algorithm. Further, find number 64, from the list 6, 10, 45, 64, 70, 89, 92, 97, 99 using Binary Search algorithm?  **OR** | **5** | **5** |
| **7** | What is Divide and Conquer technique? Explain with an example. | **5** | **5** |
| **8** | Draw the state-space tree along with answer nodes for 4-queens problem.  .  **OR** | **5** | **5** |
| **9** | What is sum-of-subsets problem? Find all possible solution for given elements whose weights are (w1,w2,w3,w4,w5)=(2,3,5,6,8,10) and m=10. Draw its State-Space Tree. | **5** | **5** |
| **10** | Write Graph coloring algorithm. Draw the state space tree for the following graph.  **OR** | **5** | **5** |
| **11** | Solve the instance of 0/1 knapsack problem using Dynamic Programming given weights = {1,3,4,5} and profit = {1, 4, 5, 7} having Knapsack weight = 7 and n=4. | **5** | **5** |