

**SYNERGY INSTITUTE OF ENGINEERING AND TECHNOLOGY, DHENKANAL**

Near NH-55, Banamali Prasad – 759001

**Quiz-IV**

**Full Marks-05**

**Duration-05 Min**

**Subject with Code:** DAA\_LAB (CSPC2206)

**Year & Semester:** 2nd & 4th

**Course & Branch**: B. Tech. & CSE

**Name: Registration No-**

**Roll No-**

Answer All Questions

**Tick the Correct Answer/Answers**

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| **Course Outcome** | **Total Marks** | **Marks Secured** | **Signature of Evaluator** |
| **CO2** | **05** |  |  |

**1.Which of the following statements is true about the Fractional Knapsack problem? [0.5 Mark][CO2][L3]**  
a) Items can only be taken as a whole  
b) Items can be divided into smaller parts  
c) It cannot be solved using the greedy method  
d) It requires O(n²) time complexity

**2.Which strategy does the Greedy Algorithm use for solving the Fractional Knapsack problem? [0.5 Mark][CO2][L3]**  
a) Select the item with the highest weight  
b) Select the item with the highest value  
c) Select the item with the highest value-to-weight ratio  
d) Select the item randomly

**3.Why does the Greedy Method fail for the 0/1 Knapsack problem?[0.5 Mark][CO2][L3]**  
a) It does not consider the total weight  
b) It cannot handle integer constraints correctly  
c) It only works on sorted input  
d) It does not always find the optimal solution

**4.What is the time complexity of solving the 0/1 Knapsack problem using Dynamic Programming? [0.5 Mark][CO2][L3]**  
a) O(n log n)  
b) O(2ⁿ)  
c) O(nW)  
d) O(n²)

**5.Which type of approach is used in the Dynamic Programming solution to the 0/1 Knapsack problem? [0.5 Mark][CO2][L3]**  
a) Bottom-up approach  
b) Top-down approach  
c) Divide and Conquer  
d) Both (a) and (b)

**6.In the Dynamic Programming approach to the 0/1 Knapsack problem, what does the DP table store? [0.5 Mark][CO2][L3]**  
a) The total weight of the knapsack  
b) The maximum value that can be obtained for each subproblem  
c) The items selected for the knapsack  
d) The remaining capacity of the knapsack

**7.In the 0/1 Knapsack problem using Dynamic Programming, if** dp[i][w] **represents the maximum value for** i **items and weight** w**, which recurrence relation is correct? [0.5 Mark][CO2][L3]**  
a) dp[i][w] = max(dp[i-1][w], dp[i-1][w-wt[i]] + val[i]) if wt[i] ≤ w  
b) dp[i][w] = dp[i-1][w] + dp[i][w-wt[i]]  
c) dp[i][w] = min(dp[i-1][w], dp[i-1][w-wt[i]] + val[i])  
d) dp[i][w] = dp[i][w] - dp[i-1][w-wt[i]]

**8.Which approach is used to solve the Fractional Knapsack problem efficiently? [0.5 Mark][CO2][L3]**  
a) Greedy Algorithm  
b) Dynamic Programming  
c) Brute Force  
d) Backtracking

**9.How can we optimize the space complexity of the Dynamic Programming solution for the 0/1 Knapsack problem? [0.5 Mark][CO2][L3]**  
a) Use a greedy method instead  
b) Use a 1D array instead of a 2D array  
c) Use recursion instead of iteration  
d) Reduce the number of items in the problem

**10.Which of the following statements is true regarding the Dynamic Programming approach for 0/1 Knapsack? [0.5 Mark][CO2][L3]**  
a) It guarantees an optimal solution  
b) It works faster than the Greedy approach for large inputs  
c) It requires additional space compared to the Greedy approach  
d) All of the above