1. What is the Knapsack problem?
   1. A problem in graph theory
   2. A problem in network flow
   3. **A problem in dynamic programming**
   4. A problem in combinatorial optimization
2. Which type of knapsack problem allows selecting each item at most once?
   1. **0/1 Knapsack**
   2. Fractional Knapsack
   3. Bounded Knapsack
   4. Unbounded Knapsack
3. In the 0/1 Knapsack problem, can we include a fraction of an item?
   1. Yes
   2. **No**
4. Which type of knapsack problem allows selecting any fraction of an item?
   1. 0/1 Knapsack
   2. **Fractional Knapsack**
   3. Bounded Knapsack
   4. Unbounded Knapsack
5. What is the objective in the Knapsack problem?
   1. Minimize the total weight
   2. **Maximize the total value**
   3. Minimize the total value
   4. Maximize the total weight
6. Which dynamic programming approach is commonly used to solve the Knapsack problem?
   1. Top-down approach
   2. Greedy approach
   3. **Bottom-up approach**
   4. Divide and conquer
7. In the 0/1 Knapsack problem, what does the "0" represent?
   1. No constraints on item selection
   2. Fractional item selection
   3. No repetition of items
   4. **Binary item selection (either 0 or 1)**
8. Which approach is used to solve the Fractional Knapsack problem?
   1. Dynamic programming
   2. **Greedy algorithm**
   3. Branch and bound
   4. Backtracking
9. Which type of Knapsack problem allows selecting multiple copies of the same item?
   1. 0/1 Knapsack
   2. Fractional Knapsack
   3. Bounded Knapsack
   4. **Unbounded Knapsack**
10. In the Knapsack problem, what is the significance of the "knapsack capacity"?
    1. The maximum number of items that can be selected
    2. **The maximum weight that can be carried**
    3. The maximum value that can be achieved
    4. The number of available items
11. Which data structure is commonly used to implement dynamic programming for the Knapsack problem?
    1. Stack
    2. Queue
    3. **Table or 2D array**
    4. Linked list
12. What is the time complexity of solving the 0/1 Knapsack problem using dynamic programming?
    1. O(n)
    2. O(n log n)
    3. O(n^2)
    4. **O(nW), where W is the knapsack capacity**
13. In the Fractional Knapsack problem, what is the key factor for item selection?
    1. Item weight
    2. Item value
    3. **Item ratio (value-to-weight ratio)**
    4. Item name
14. Which of the following statements is true about the Bounded Knapsack problem?
    1. Each item can be selected multiple times.
    2. Only a fraction of each item can be selected.
    3. **Each item can be selected at most once.**
    4. There is no restriction on item selection.
15. Which Knapsack problem is also known as the "Fractional Knapsack" problem?
    1. 0/1 Knapsack
    2. **Fractional Knapsack**
    3. Bounded Knapsack
    4. Unbounded Knapsack
16. What is the space complexity of solving the Knapsack problem using dynamic programming?
    1. O(n)
    2. O(n log n)
    3. O(n^2)
    4. **O(nW), where W is the knapsack capacity**
17. In the 0/1 Knapsack problem, what does "1" represent?
    1. The minimum weight of an item
    2. The maximum weight of an item
    3. The maximum number of items to be selected
    4. **The option to either select or not select an item**
18. Which Knapsack problem involves selecting a subset of items to maximize total value, subject to a weight constraint?
    1. **0/1 Knapsack**
    2. Fractional Knapsack
    3. Bounded Knapsack
    4. Unbounded Knapsack
19. What is the primary difference between the 0/1 Knapsack and Fractional Knapsack problems?
    1. **0/1 Knapsack allows fractional item selection, while Fractional Knapsack does not.**
    2. Fractional Knapsack allows selecting each item at most once, while 0/1 Knapsack does not.
    3. 0/1 Knapsack allows selecting multiple copies of the same item, while Fractional Knapsack does not.
    4. There is no difference; they are the same problem.
20. Which Knapsack problem involves selecting each item at most once and has a binary decision for item selection?
    1. **0/1 Knapsack**
    2. Fractional Knapsack
    3. Bounded Knapsack
    4. Unbounded Knapsack
21. In dynamic programming for the 0/1 Knapsack problem, what does the state "dp[i][w]" represent?
    1. **The maximum value achievable by selecting items from the first "i" items with a maximum weight limit of "w."**
    2. The total weight of items selected from the first "i" items.
    3. The number of items selected from the first "i" items.
    4. The maximum weight limit achievable by selecting items from the first "i" items.
22. Which algorithm is used to solve the Fractional Knapsack problem optimally?
    1. **Greedy algorithm**
    2. Dynamic programming
    3. Backtracking
    4. Branch and bound
23. In the Fractional Knapsack problem, how is the ratio of value-to-weight used to make decisions?
    1. **Items with the highest ratio are selected first.**
    2. Items with the lowest ratio are selected first.
    3. Items are selected randomly.
    4. The ratio is not used in this problem.
24. In the Bounded Knapsack problem, how many times can each item be selected?
    1. At most once
    2. **Multiple times**
    3. An arbitrary number of times
    4. Depends on the item weight
25. Which Knapsack problem involves selecting a subset of items without exceeding a weight constraint?
    1. **0/1 Knapsack**
    2. Fractional Knapsack
    3. Bounded Knapsack
    4. Unbounded Knapsack
26. In the Unbounded Knapsack problem, what does the term "unbounded" signify?
    1. There are no constraints on item selection.
    2. Each item can be selected at most once.
    3. **Each item can be selected multiple times.**
    4. The knapsack capacity is unlimited.
27. Which approach is used to solve the Fractional Knapsack problem when items cannot be divided?
    1. Dynamic programming
    2. **Greedy algorithm**
    3. Backtracking
    4. Brute force
28. In the Unbounded Knapsack problem, can the same item be selected more than once?
    1. **Yes**
    2. No
29. Which Knapsack problem has a time complexity of O(n log n) when solved optimally?
    1. 0/1 Knapsack
    2. **Fractional Knapsack**
    3. Bounded Knapsack
    4. Unbounded Knapsack
30. In the Knapsack problem, what is the purpose of the "value" associated with each item?
    1. To specify the item's weight
    2. To determine the item's name
    3. **To indicate the profit or benefit of selecting the item**
    4. To represent the item's quantity
31. Which Knapsack problem allows selecting each item at most once and has a fractional item selection option?
    1. **0/1 Knapsack**
    2. Fractional Knapsack
    3. Bounded Knapsack
    4. Unbounded Knapsack
32. Which Knapsack problem involves selecting a subset of items to maximize total profit, subject to a weight constraint?
    1. **0/1 Knapsack**
    2. Fractional Knapsack
    3. Bounded Knapsack
    4. Unbounded Knapsack
33. In the Unbounded Knapsack problem, what does the "unbounded" signify?
    1. There are no constraints on item selection.
    2. Each item can be selected at most once.
    3. **Each item can be selected multiple times.**
    4. The knapsack capacity is unlimited.
34. In the Knapsack problem, what is the purpose of the "weight" associated with each item?
    1. To specify the item's name
    2. To determine the item's value
    3. To indicate the maximum quantity of the item that can be selected
    4. **To represent the item's size or capacity**
35. Which Knapsack problem involves selecting each item at most once and has a binary decision for item selection?
    1. **0/1 Knapsack**
    2. Fractional Knapsack
    3. Bounded Knapsack
    4. Unbounded Knapsack