

siddh34 / MCQs Public

[Code](#) [Issues](#) [Pull requests](#) [Actions](#) [Projects](#) [Security](#) [Insights](#)

master ▾

...

[MCQs](#) / [Insem2](#) / DAA.md

siddh34 Update DAA

[History](#)

2 contributors



898 lines (595 sloc) | 23.4 KB

...

DAA MCQ's

- These questions are created for **The purpose of practice**
- CIE Questions are also included
- Before proceeding very important to visit this drive first

[DAA Drive Link](#)

Unit 1

Q1. An ___ is defined as a set of well-defined instructions used to accomplish a particular task.

- A. Algorithm
- B. Function
- C. Program
- D. Procedure

Answer : Option A

Q2. The measure of the longest amount of time possibly taken to complete an algorithm is expressed as ____

- A. Little-0
- B. Little-Omega
- C. Big-Omega
- D. Big-0

Answer : Option D

Q3. A ____ is a compact, informal, and environment-independent description of a computer programming algorithm.

- A. Stack
- B. Queue
- C. Psuedocode
- D. Non-linear data structure

Answer : Option C

Q4. ____ of an algorithm is the amount of time required for it to execute.

- A. Time complexity
- B. Space complexity
- C. Compiling time
- D. Best case

Answer : Option A

Q5. Which of the following is used for solving the N Queens Problem

- A. Greedy Algorithm
- B. Dynamic Programming
- C. Backtracking
- D. Sorting

Answer : Option C

Q6. ____ is the first step in solving the problem ?

- A. Understanding the Problem
- B. Identify the Problem

- C. Evaluate the Solution
- D. Coding the Problem

Answer : Option B

Q7. The correctness and appropriateness of _____ solution can be checked very easily.

- A. Algorithmic solution
- B. heuristic solution
- C. random solution
- D. Brute force Solution

Answer : Option A

Q8. Two main measures for the efficiency of an algorithm are

- A. Processor and memory
- B. Complexity and capacity
- C. Time and space
- D. Data and space

Answer : Option C

Q9. Which of the following sorting algorithms provide the best time complexity in the worst-case scenario

- A. Merge Sort
- B. Quick Sort
- C. Bubble Sort
- D. Selection sort

Answer : Option A

Q10. Partition and exchange sort is_____

- A. Quick sort
- B. Tree sort
- C. Heap sort
- D. Bubble

Answer : Option A

Q11. Which of the following sorting algorithm is of divide and conquer type

- A. Quick sort
- B. Insertion sort
- C. Merge sort
- D. A & C

Answer : A & C

Q12. The time complexity of a quick sort algorithm which makes use of median, found by an $O(n)$ algorithm, as pivot element is

- A. $O(n^2)$
- B. $O(n \log n)$
- C. $O(n \log \log n)$
- D. $O(n)$

Answer : Option B

Q13. Which of the following algorithm design technique is used in the quick sort algorithm

- A. Dynamic programming
- B. Backtracking
- C. Divide-and-conquer
- D. Greedy method

Answer : Option C

Q14. Which of the following is not a stable sorting algorithm

- A. Quick sort
- B. Insertion sort
- C. Merge sort
- D. Bubble

Answer : Option A

Q15. Master's theorem is used for

- A. Solving recurrences
- B. Solving iterative relations

- C. Analyzing loops
- D. Calculating the time complexity of any code

Answer : Option A

16. Prim's algorithm starts constructing a minimum spanning tree from ____

- A. An arbitrary root vertex
- B. The shortest arc
- C. The left most vertex
- D. The right most vertex

Answer : Option A

17. Which method of encoding does not consider the probability of occurrence of symbols?

- A. Static Huffman coding
- B. Variable length coding
- C. Adaptive Huffman coding
- D. Fixed length coding

Answer : Option D

18. In distribution counting to sorting elements in an array ____ is used.

- A. Accumulated sum of frequencies
- B. Frequency
- C. Count of repeating elements in the array
- D. The length of the array

Answer : Option A

19. Dijkstra's algorithm is used to solve which problems

- A. Network Lock
- B. Single source shortest Path
- C. All pair shortest path
- D. Sorting

Answer : Option B

20.The basic operation of the ___ algorithm is the comparison between the element and the array given.

- A. Binary search
- B. Greedy
- C. Brute force
- D. Insertion sort

Answer : Option D

21.What is the result of the recurrences which fall under first case of Master's theorem (let the recurrence be given by $T(n)=aT(n/b)+f(n)$ and $f(n)=nc$?

- A. $T(n) = O(n^{\log_b a})$
- B. $T(n) = O(nc \log n)$
- C. $T(n) = O(f(n))$
- D. $T(n) = O(n^2)$

Answer : Option A

22.The rate at which storage memory or time grows as a function of the input size is called

- A. Storage
- B. Complexity
- C. Efficiency
- D. Load

Answer : Option C

23.Internal and External factors of Algorithm Complexity are

- A. Processor Quality
- B. Space Complexity
- C. Time Complexity
- D. All of the above

Answer : Option D

24.Which method is practical to perform a single search in an unsorted list of elements?

- A. Sequential search
- B. Bubble sort
- C. Horspool's method of string matching
- D. Brute force method of string matching

Answer : Option A

25. Which algorithm finds the solution for the single-source shortest path problem for a tree?

- A. Prim's
- B. Dijkstra's
- C. Kruskal's
- D. Huffman code

Answer : Option B

26. ___ is the minimum number of steps that can be executed for the given parameters

- A. Average case
- B. Worst case
- C. Time complexity
- D. Best case

Answer : Option D

27. ___ is the maximum number of steps that can be executed for the given parameters

- A. Average case
- B. Worst case
- C. Time complexity
- D. Best case

Answer : Option B

28. ___ is the average number of steps that can be executed for the given parameters

- A. Average case
- B. Worst case
- C. Time complexity
- D. Best case

Answer : Option A

29. $O(1)$ means computing time is ____

- A. Constant
- B. Quadratic
- C. Linear
- D. Cubic

Answer : Option A

30. $O(n)$ means computing time is _

- A. Constant
- B. Quadratic
- C. Linear
- D. Cubic

Answer : Option C

Unit I & II CIE Questions and Answers

A freelancer has the choice of completing/partially completing tasks to maximize his profits. For partial completion of jobs, partial profit can be obtained. Example for a job with (time-in-hours, profit) = (3,90), if 1/3rd is completed, then 30 profit is received; and likewise, if 1/6th is done then 15 is the profit received. He has a constraint of 100 hours and choice of 5 jobs. The 5 jobs - J1, J2, J3, J4, J5 have the following (time-in-hours, profit) respectively - ((20,5), (30,20), (66, 30), (40,40), (60,50)).

What is the maximum profit he can get in the given time constraint ?

- A. 152
- B. 156
- C. 162
- D. 216

Answer : Option C

Given the recurrence relation of an algorithm is $T(n) = 8T(n/2) + n^3$, what is its time complexity as per master's theorem

- A. $\theta(n^3)$
- B. $O(n^4 \log n)$
- C. $\theta(n^2 \log n)$
- D. $\theta(n^3 \log n)$

Answer : Option D

The time complexity of an algorithm is given as $T(n)=3n+2$. Select all correct statements related to the algorithm.

- A. Space complexity is $O(n)$
- B. Time complexity is $\Omega(n)$
- C. It is a sublinear algorithm
- D. Algorithm has non polynomial time complexity

Answer : Option B

Select correct statements regarding multi-stage graph problem

- A. It can be solved faster with a greedy strategy, like Dijkstra.
- B. It requires solution of optimal subpaths of vertices (in stages nearer to destination) to destination, in forward approach
- C. It requires solution of optimal subpaths of vertices (in stages nearer to destination) to destination, in backward approach
- D. The backward approach uses, optimal subpaths from start vertex.

Answer : Option A

For the problem of job sequencing with deadlines, where each job requires 1 unit time to complete, on the single available machine, select all the feasible solution sequence/sequences for the 5 jobs - J_1, J_2, J_3, J_4, J_5 where their respective (profits, deadlines) are in following tuples $(12,3), (15,2), (9,1), (18,2), (7,3)$.

- A. J_1, J_2, J_3
- B. J_5, J_4, J_1
- C. J_2, J_4, J_1
- D. None of Above

Answer : Option C

Which statements are correct related to Greedy strategy

- A. The greedy algorithm guarantees optimal solution to a given maximization / minimization criterion function
- B. Greedy algorithm always makes the choice (greedy criteria) that looks best at the moment, to optimize a given objective function.
- C. Greedy Knapsack problem (fractional knapsack) will generally give a better profits as compared to dynamic 0/1 Knapsack
- D. Greedy strategy generates a single feasible and single optimal solution
- E. Time complexity of Greedy strategy, as per its control abstraction, is $O(n)$

Answer : B,C

Select all correct options related to Quicksort and Mergesort.

- A. Mergesort can have a worst-case time complexity of $O(n^2)$ when the merging is poorly done
- B. Other than the requirement of storing n elements, Quicksort has a space complexity of $O(\log n)$ due to the recursive call stack
- C. Quicksort is better in terms of worst-case sorting performance and may be a better choice for scenarios where memory usage is not a concern
- D. In terms of time complexity, both Quicksort and Mergesort algorithms have the same average case time complexity of $O(n \log n)$
- E. Other than the requirement of storing n elements, Mergesort has a space complexity of $O(n)$ due to the need to create temporary arrays to merge subarrays.

Answer : B,D,E

Given the recurrence relation of an algorithm is $T(n) = 8T(n/2) + n$, what is its time complexity as per master's theorem?

- A. $\theta(n^3)$
- B. $O(n^2)$
- C. $\theta(n^2 \log n)$
- D. $\theta(n^2 \log^2(n))$

Answer : Option A

For 0/1 knapsack problem solved using dynamic programming, to traceback the solution from the available, filled, 2D, $K[n, m]$ table of optimal sub solutions, what needs to be done? Select all correct answers.

- A. Start from last cell, i.e. extreme bottom right cell i.e. $K[n, m]$
- B. Start from the first, i.e. extreme left uppermost cell i.e. $K[1, 1]$

- C. If $K[i,j]=K[i-1,j]$ then this means that $ith\ object=0$ (is not selected)
- D. If $K[i,j]\neq K[i-1,j]$, then this means that $ith\ object=1$ (is selected)

Answer : A,C,D

What is true regarding the general divide and conquer strategy? Select all correct options.

- A. Its control abstraction -first, divides the problem into subproblems, and then combines the solution and next applies the strategy to the subproblems
- B. For $n>1$, its time complexity generally is $\rightarrow aT(n/b)+f(n)$, where $f(n)$ is the time to divide the problem into subproblems
- C. The solution to the small(P) situation is generally $T(1)$
- D. It is naturally expressed as a recursive algorithm

Answer : A,B,D

Which options have the correct sequences of decreasing time complexities?

- A. $O(n^2 \cdot n^n), O(n^{3 \cdot 2^n}), O(2^n), O(n!)$
- B. $O(n \cdot n!), O(n \cdot 2^n), O(2^n), O(n^7)$
- C. $O(2^n), O(n), O(\log n), O(1)$
- D. $O(n^4), O(n^3), O(n^2 \cdot 2^n), O(n^n)$

Answer : Option C

When constructing OBST for the following instance, $n = 4$, and, for nodes (n_1, n_2, n_3, n_4) the p and q values are $(p_1, p_2, p_3, p_4) = (12, 16, 13, 7)$, $(q_0, q_1, q_2, q_3, q_4) = (17, 14, 15, 12, 19)$, what is the cost of the subproblem $c(1,2)$ and root $r(3,4)$, if $c(0,4)$ is the cost of OBST, and $r(0,4)$ is its root node?

- A. $c(1,2)=48$ and $r(3,4) = n_3$
- B. $c(1,2)=45$ and $r(3,4)=n_3$
- C. $c(1,2)=43$ and $r(3,4)=n_4$
- D. $c(1,2)=45$ and $r(3,4)=n_4$

Answer : Option D

What is correct asymptotically?

- A. If a function is $O(n)$ it is also $O(n^2)$, and $O(n^3)$
- B. If a function is $O(n^3)$ it is also $O(n)$
- C. If a function is $\Omega(n^2)$ it is also $\Omega(n)$ and $\Omega(1)$
- D. $o(n^2) = 2n^2 + 8$

Answer : Option A,C

Unit 2

Q1. Greedy Algorithms have following characteristic.

- A. Objective function
- B. Feasible solution
- C. Selection function
- D. All of these

Answer : Option D

Q2. Branch & Bound Technique uses

- A. Lower Bound
- B. Upper Bound
- C. Both Lower Bound & Upper Bound
- D. None of these

Answer : Option C

Q3. Longest Common Subsequence Problem can be solved by

- A. Greedy Method
- B. Divide & Conquer
- C. Dynamic Programming
- D. None of these

Answer : Option C

Q4. Divide and Conquer is a general design paradigm does not consist the following part

- A. Divide
- B. Recursion

- C. Iteration
- D. Conquer

Answer : Option C

Q5. The Knapsack problem where the objective function is to minimize the profit is

- A. Greedy
- B. Dynamic 0 / 1
- C. Back tracking
- D. Branch & Bound 0/1

Answer : Option D

Q6. The worst case time complexity of the nondeterministic dynamic knapsack algorithm is

- A. $O(n \log n)$
- B. $O(\log n)$
- C. $O(n^2)$
- D. $O(n)$

Answer : Option D

Q7. Which of the following standard algorithms is not a Greedy algorithm

- A. Dijkstra's shortest path algorithm
- B. Prim's algorithm
- C. Kruskal algorithm
- D. Huffman Coding
- E. Bellmen Ford Shortest path algorithm

Answer : Option E

Q8. From the following algorithm design techniques which one is used to find all the pairs of shortest distances in a graph

- A. Backtracking
- B. Greedy
- C. Dynamic programming
- D. Divide and Conquer

Answer : Option C

Q9. Kruskal's algorithm uses----- and prim's algorithm uses----- in determining the MST

- A. edges, vertex
- B. vertex, edges
- C. edges, edges
- D. vertex, vertex

Answer : Option A

Q10. The Knapsack problem is an example of

- A. Greedy algorithm
- B. 2D dynamic programming
- C. 1D dynamic programming
- D. Divide and conquer

Answer : Option B

Q11. Which of the following methods can be used to solve the Knapsack problem

- A. Brute force algorithm
- B. Recursion
- C. Dynamic programming
- D. Brute force, Recursion and Dynamic Programming

Answer : Option D

Q12. What is the time complexity of the brute force algorithm used to solve the Knapsack problem

- A. $O(n)$
- B. $O(n!)$
- C. $O(2^n)$
- D. $O(n^3)$

Answer : Option C

Q13. Job sequencing with deadline is based on _ method.

- A. Greedy Method
- B. Branch & Bound
- C. Dynamic Programming
- D. Divide & Conquer

Answer : Option A

Q14. Which of the following algorithms is the best approach for solving Huffman codes

- A. Greedy algorithm
- B. 2D dynamic programming
- C. 1D dynamic programming
- D. Divide and conquer

Answer : Option A

Q15. In Huffman coding, data in a tree always occur

- A. roots
- B. leaves
- C. left sub trees
- D. right sub trees

Answer : Option B

Q16. An optimal code will always be present in a full tree.

- A. True
- B. False

Answer : Option A

Q17. What is the running time of the Huffman encoding algorithm

- A. $O(C)$
- B. $O(\log C)$
- C. $O(C \log C)$
- D. $O(N \log C)$

Answer : Option C

Q18. What is the running time of the Huffman algorithm, if its implementation of the priority queue is done using linked lists

- A. $O(C)$
- B. $O(\log C)$
- C. $O(C \log C)$
- D. $O(C^2)$

Answer : Option D

Q19. Identify the correct problem for multistage graph from the list given below.

- A. Resource allocation problem
- B. Traveling salesperson problem
- C. Producer consumer problem
- D. Barber's problem
- E. Dining philosopher problem.

Answer : Option A

Q20. In job sequencing with deadlines, an optimal solution is a feasible solution with ___ profit.

- A. Positive
- B. Negative
- C. Maximum
- D. Minimum

Answer : Option C

Q21. The multistage graph problem is to find the/a ___ path.

- A. Maximum-cost
- B. Minimum-cost
- C. Shortest
- D. Longest

Answer : Option B

Q22. Which of the following is/are property/properties of a dynamic programming problem

- A. Optimal substructure
- B. Overlapping subproblems
- C. Greedy approach
- D. Both optimal substructure and overlapping subproblems

Answer : Option D

Q23. If an optimal solution can be created for a problem by constructing optimal solutions for its subproblems, the problem possesses __ property.

- A. Overlapping subproblems
- B. Optimal substructure
- C. Memoization
- D. Greedy

Answer : Option B

Q24. When dynamic programming is applied to a problem, it takes far less time as compared to other methods that don't take advantage of overlapping subproblems.

- A. True
- B. False

Answer : True

Q25. In dynamic programming, the technique of storing the previously calculated values is called __

- A. Saving value property
- B. Storing value property
- C. Memoization
- D. Mapping

Answer : Option C

Unit 3

Q1. Which of the problems can be solved by backtracking method

- A. n-queen problem
- B. subset sum problem

- C. hamiltonian circuit problem
- D. All above

Answer : Option D

Q2. Backtracking algorithm is implemented by constructing a tree of choices called as

- A. State-space tree
- B. State-chart tree
- C. Node tree
- D. Backtracking tree

Answer : Option A

Q3. What happens when the backtracking algorithm reaches a complete solution

- A. It backtracks to the root
- B. It continues searching for other possible solutions
- C. It traverses from a different route
- D. Recursively traverses through the same route

Answer : Option B

Q4. A node is said to be ___ if it has a possibility of reaching a complete solution.

- A. Non-promising
- B. Promising
- C. Succeeding
- D. Preceding

Answer : Option B

Q5. In what manner is a state-space tree for a backtracking algorithm constructed

- A. Depth-first search
- B. Breadth-first search
- C. Twice around the tree
- D. Nearest neighbour first

Answer : Option A

Q6. The leaves in a state-space tree represent only complete solutions.

- A. True
- B. False

Answer : Option B

Q7. In general, backtracking can be used to solve

- A. Numerical problems
- B. Exhaustive search
- C. Combinatorial problems
- D. Graph coloring problems

Answer : Option C

Q8. Which one of the following is an application of the backtracking algorithm

- A. Finding the shortest path
- B. Finding the efficient quantity to shop
- C. Ludo
- D. Crossword

Answer : Option D

Q9. Backtracking algorithm is faster than the brute force technique

- A. True
- B. False

Answer : Option A

Q10. Which of the following logical programming languages is not based on backtracking

- A. Icon
- B. Prolog
- C. Planner
- D. Fortran

Answer : Option D

Q11. The problem of finding a list of integers in a given specific range that meets certain conditions is called

- A. Subset sum problem
- B. Constraint satisfaction problem
- C. Hamiltonian circuit problem
- D. Travelling salesman problem

Answer : Option B

Q12. Who coined the term 'backtracking

- A. Lehmer
- B. Donald
- C. Ross
- D. Ford

Answer : Option A

Q13. __ enumerates a list of promising nodes that could be computed to give the possible solutions of a given problem.

- A. Exhaustive search
- B. Brute force
- C. Backtracking
- D. Divide and conquer

Answer : Option C

Q14. The problem of finding a subset of positive integers whose sum is equal to a given positive integer is called as

- A. n- queen problem
- B. subset sum problem
- C. knapsack problem
- D. hamiltonian circuit problem

Answer : Option B

Q15. The problem of placing n queens in a chessboard such that no two queens attack each other is called as

- A. n-queen problem
- B. eight queens puzzle
- C. four queens puzzle
- D. 1-queen problem

Answer : Option A

Q16. Who published the eight queens puzzle

- A. Max Bezzel
- B. Carl
- C. Gauss
- D. Friedrich

Answer : Option A

Q17. For how many queens was the extended version of Eight Queen Puzzle applicable for $n \times n$ squares

- A. 5
- B. 6
- C. 8
- D. n

Answer : Option D

Q18. Who proposed the depth first backtracking algorithm

- A. Edsger Dijkshtra
- B. Max Bezzel
- C. Frank Nauck
- D. Carl Friedrich

Answer : Option A

Q19. How many solutions are there for 8 queens on 8×8 board

- A. 12
- B. 91
- C. 92
- D. 93

Answer : Option C

Q20. In how many directions do queens attack each other

- A. 1
- B. 2
- C. 3
- D. 4

Answer : Option C

Q21. Where is the n-queens problem implemented

- A. carom
- B. chess
- C. ludo
- D. cards

Answer : Option B

Q22. Branch and bound is a _

- A. problem solving technique
- B. data structure
- C. sorting algorithm
- D. type of tree

Answer : Option A

Q23. Which data structure is most suitable for implementing best first branch and bound strategy

- A. stack
- B. queue
- C. priority queue
- D. linked list

Answer : Option C

Q24. What is the condition for proper coloring of a graph

- A. two vertices having a common edge should not have same color
- B. two vertices having a common edge should always have same color
- C. all vertices should have a different color
- D. all vertices should have same color

Answer : Option A

Q25. What is a chromatic number

- A. The maximum number of colors required for proper edge coloring of graph
- B. The maximum number of colors required for proper vertex coloring of graph
- C. The minimum number of colors required for proper vertex coloring of graph
- D. The minimum number of colors required for proper edge coloring of graph

Answer : Option C

Q26. Travelling salesman problem is an example of__

- A. Divide & Conquer
- B. Recursive Approach
- C. Dynamic Algorithm
- D. Greedy Algorithm

Answer : Option D

Q27. __ organizes details of all candidate solutions and discards large subsets of fruitless candidates by using upper and lower estimated bounds of the quantity being optimized.

- A. Approximation algorithms
- B. Dynamic programming
- C. Greedy algorithm
- D. Branch and Bound

Answer : Option D

Q28. In a knapsack problem, if a set of items are given, each with a weight and a value, the goal is to find the number of items that __ the total weight and __ the total value.

- A. Minimizes, Minimizes
- B. Maximizes, Maximizes

- C. Maximizes, Minimizes
- d. Minimizes, Maximizes

Answer : Option D

Q29. In what manner is a state-space tree for a backtracking algorithm constructed ?

- A. Depth First Search
- B. Breadth First Search
- C. Twice around the tree
- D. Nearest neighbour first

Answer : Option A

Q30. Backtracking algorithm is faster than the brute force technique.

- A. True
- B. False

Answer : True