DAAQbank - MCQ

Design and analysis of algorithm (Lovely Professional University)

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Objective Type Questions with Solutions

1. 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

2. The time factor when determining the efficiency of algorithm is measured by
   a. Counting microseconds
   b. **Counting the number of key operations**
   c. Counting the number of statements
   d. Counting the kilobytes of algorithm

3. Which of the following case does not exist in complexity theory
   a. Best case
   b. Worst case
   c. Average case
   d. **Null case**

4. 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

5. Choose the correct answer for the following statements:

   I. The theory of NP–completeness provides a method of obtaining a polynomial time for NPalgorithms.

   II. All NP-complete problem are NP-Hard.

a. I is FALSE and II is TRUE

b. I is TRUE and II is FALSE

c. Both are TRUE

d. Both are FALSE

6. What is the type of the algorithm used in solving the 8 Queens problem?

a. Greedy

b. Dynamic

c. Branch and Bound

d. **Backtracking**

7. Sorting is not possible by using which of the following methods?

a. Insertion

b. Selection

c. Deletion

d. Exchange

8. The upper bound on the time complexity of the nondeterministic sorting algorithm is

a. **O(n)**

b. O(n log n)

c. O(1)

d. O(log n)

9. 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)**

10. Dijkastra's algorithm bears some similarity to

a. BFS

b. prim's algorithm
c. DFS
d. **Both (A) & (C)**

11. The concept of order Big O is important because
    a. **It can be used to decide the best algorithm that solves a given problem**
    b. It determines the maximum size of a problem that can be solved in a given amount of time
    c. It is the lower bound of the growth rate of algorithm
    d. Both A and B

12. **There are _____steps to solve the problem**
    a. Seven
    b. Four
    c. Six
    d. Two

13. **_____is the first step in solving the problem**
    a. Understanding the Problem
    b. Identify the Problem
    c. Evaluate the Solution
    d. None of these

14. **_____ solution requires reasoning built on knowledge and experience**
    a. Algorithmic Solution
    b. Heuristic Solution
    c. Random Solution
    d. None of these

15. The space factor when determining the efficiency of algorithm is measured by
    a. Counting the maximum memory needed by the algorithm

b. Counting the minimum memory needed by the algorithm
c. Counting the average memory needed by the algorithm
d. Counting the maximum disk space needed by the algorithm

16. Straight selection sort is basically a method of repeated
a. A. interchange
b. searching
c. **position adjustment**
d. None of the above

17. Breadth first search _____
a. Scans each incident node along with its children.
b. Scans all incident edges before moving to other node.
c. Issame as backtracking
d. Scans all the nodes in random order.

18. The asymptotic notation for defining the average time complexity is
a. Equivalence
b. Symmetric
c. Reflexive
d. Both (c) and (d) above.

19. Prims algorithm is based on _____ method
a. Divide and conquer method
b. Dynamic programming
c. Greedy method
d. Branch and bound

20. _____ is the minimum number of steps that can executed for the given parameters
a. Average case
b. Worst case

c. Time complexity

d. Best case

21. _____ is the maximum number of steps that can executed for the given parameters

a. Average case

b. Worst case

c. Time complexity

d. Best case

22. _____ is the average number of steps that can executed for the given parameters

a. Average case

b. Worst case

c. Time complexity

d. Best case

23. Which design strategy stops theexecution when it find the solution otherwise starts the problem from top

a. Back tracking

b. Divide and conquer

c. Branch and Bound

d. Dynamic programming

24. Graphical representation of algorithm is _____

a. Pseudo-code

b. Graph Coloring

c. Flow Chart

d. Dynamic programming

25. O(1) means computing time is _____

a. Constant

b. Quadratic

c. Linear

d. Cubic

26. O(n) means computing time is _____

a. Constant

b. Quadratic

c. Linear

d. Cubic

27. O(n2) means computing time is _____

a. Constant

b. Quadratic

c. Linear

d. Cubic

28. O(n3) means computing time is _____

a. Exponential

b. Quadratic

c. Linear

d. Cubic

29. O(2n) means computing time is _____

a. Constant

b. Quadratic

c. Linear

d. Exponential

30. Tight bound is denoted as _____

a. Ω

b. Θ

c. Ω

d. O

31. Upper bound is denoted as _____

a. **Ω**

b. Θ

c. ω

d. O

32. Lower bound is denoted as _____

a. Ω

b. Θ

c. ω

d. O

33. The output of Kruskal and Prims algorithm is _____

a. Maximum spanning tree

b. Spanning tree

c. Minimum spanning tree

d. None of these

34. BFS is best compared to DFS in the case of _____

a. The graph's width is large

b. The graph's depth is large

c. The graph consists of many nodes

d. The graph is complex

35. 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

36. **Which is true statement.**

a. **Breadth first search is shortest path algorithm that works on un-weighted graphs**

b. Depth first search is shortest path algorithm that works on un-weighted graphs.

c. Both of above are true.

d. None of above are true.

37. 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

38. From the following sorting algorithms which has the lowest worst case complexity?

a. Bubble sort

b. Quick sort

c. Merge sort

d. Selection sort

39. An algorithm is defined as

a. a mathematical formula that solves a problem.

b. a tempo for classical music played in a coda.

c. a logical sequence of a steps that solve a problem.

d. a tool that designs computer programs and draws the user interface.

40. An algorithm that calls itself directly or indirectly is known as

a. Sub algorithm

b. Recursion

c. Polish notation

d. Traversal algorithm

41. If each node in a tree has value greater than every value in its left sub tree and value less than every value in its right sub tree, the tree is known as
    a. Complete Tree
    b. Full Binary Tree
    c. **Binary Search Tree**
    d. Threaded Tree

42. Which of the following sorting procedure is the slowest?
    a. Quick sort
    b. Heap sort
    c. Shell sort
    d. **Bubble sort**

43. A complete binary tree with the property that the value at each node is at least as large as the values at its children is known as
    a. Binary search tree
    b. AVL tree
    c. Completely balanced tree
    d. Heap

44. Which of the following shows the correct relationship among some of the more common computing times on algorithms
    a. $O(\log n) < O(n) < O(n * \log n) < O(2^n) < O(n^2)$
    b. $O(n) < O(\log n) < O(n * \log n) < O(2^n) < O(n^2)$
    c. $O(n) < O(\log n) < O(n * \log n) < O(n^2) < O(2^n)$
    d. $O(\log n) < O(n) < O(n * \log n) < O(n^2) < O(2^n)$

45. What is an optimal Huffman code for alphabet**a** of the following set of frequencies a: 05, b:48, c:07, d:17, e:10, f:13
    a. **1010**

b. (B)0101

c. 1001

d. 1100

46. Which of the following properties are necessary for an Algorithm?

a. Definiteness

b. Correctness

c. Effectiveness

d. **A and C**

47. The running time of Floyd-Warshall algorithm is

a. Θ (n)

b. Θ (n^3)

c. **Θ (n^2)**

d. Θ (n log n)

48. 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

49. The time required to search an element in a linked list of length n is

a. O(log n)

b. **O(n)**

c. O(1)

d. O(n^2)

50. Which of the following is true

a. **P is subset of NP**

b. NP is subset of P

c. P and NP are equal

d. NP is subset of NP hard