

Online Examinations (Even Sem/Part-I/Part-II Examinations 2020 - 2021)

Course Name - --Data Structure and Algorithm

Course Code - BCAC202

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Answer all the questions. Each question carry one mark.

8. 1. Which of these best describes an array?

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- A data structure that shows a hierarchical behaviour
- Container of objects of similar types
- Arrays are immutable once initialised
- Array is not a data structure

9. 2. Which linear structure has a provision of Last-In-First-Out (LIFO) mechanism for its elements?

Mark only one oval.

- Stack
- Queue
- Stack & Queue
- none

10. 3. The postfix form of $A*B+C/D$ is

Mark only one oval.

- *AB/CD+
- AB*CD/+
- A*BC+/D
- ABCD+/*

11. 4. Which type of linked list contains a pointer to the next node in the sequence?

Mark only one oval.

- Singly Linked List
- Circular Linked List
- Doubly Linked List
- All of these.

12. 5. The best data structure to evaluate an arithmetic expression (in postfix form) is

Mark only one oval.

- Queue
- Stack
- Tree
- linked list

13. 6. A normal queue, if implemented using an array of size MAX_SIZE, gets full when

Mark only one oval.

- Rear = MAX_SIZE - 1
- Front = (rear + 1) mod MAX_SIZE
- Front = rear + 1
- Rear = front

14. 7. Which expressions are also regarded as ' Reverse Polish Notations '?

Mark only one oval.

- Prefix
- Postfix
- Infix
- None

15. 8. The given array is $arr = \{1,2,4,3\}$. Bubble sort is used to sort the array elements. How many iterations will be done to sort the array?

Mark only one oval.

- 4
- 2
- 1
- 0

16. 9. The given array is $arr = \{3,4,5,2,1\}$. The number of iterations in bubble sort and selection sort respectively are,

Mark only one oval.

- 5 and 4
- 4 and 5
- 2 and 4
- 2 and 5

17. 10. Which search is better?

Mark only one oval.

- Linear
- Binary
- both Linear & Binary
- None

18. 11, 6, 8, 4, 3, and 1 are inserted into a data structure in that order. An item is deleted using only a basic data structure operation. If the deleted item is a 1, the data structure cannot be a ?

Mark only one oval.

- Queue
- Tree
- Stack
- None

19. 12. If the array is already sorted, which of these algorithms will exhibit the best performance

Mark only one oval.

- Merge sort
- Bubble sort
- Insertion sort
- None

20. 13. The retrieval of items in a stack is operation.

Mark only one oval.

- Push
- Pop
- Retrieval
- access

21. 14. Which is the pointer associated with the stack?

Mark only one oval.

- FIRST
- FRONT
- TOP
- REAR

22. 15. The elements are removed from a stack in order.

Mark only one oval.

- Reverse
- Hierarchical
- Alternative
- Sequential

23. 16. Which of the following is an application of stack?

Mark only one oval.

- finding factorial
- tower of Hanoi
- infix to postfix
- All of these.

24. 17. Before inserting into the stack one must check the condition

Mark only one oval.

- Overflow
- Underflow
- Maximum elements
- Existing elements

25. 18. is a collection of elements such that each element has been assigned a processing priority.

Mark only one oval.

- Priority queue
- Procedure queue
- Main queue
- Interrupt queue

26. 19. In, search starts at the beginning of the list and checks every element in the list.

Mark only one oval.

- Linear search
- Binary search
- Hash Search
- Binary Tree search

27. 20. The operation of processing each element in the list is known as

Mark only one oval.

- Sorting
- Merging
- Inserting
- traversal

28. 21. To insert a new node in the linked list free node will be available in

Mark only one oval.

- Available list
- Avail list
- Free node list
- Memory space list

29. 22. A doubly linked list is also called as

Mark only one oval.

- linked list
- one way chain
- two way chain
- right link

30. 23. What is a full binary tree?

Mark only one oval.

- Each node has exactly zero or two children
- Each node has exactly two children
- All the leaves are at the same level
- Each node has exactly one or two children

31. 24. What does 'stack underflow' refer to?

Mark only one oval.

- accessing item from an undefined stack
- adding items to a full stack
- removing items from an empty stack
- index out of bounds exception

32. 25. To obtain a prefix expression, which of the tree traversals is used?

Mark only one oval.

- Level-order traversal
- Pre-order traversal
- Post-order traversal
- In-order traversal

33. 26. Which type of traversal of binary search tree outputs the value in sorted order?

Mark only one oval.

- Pre-order
- In-order
- Post-order
- None

34. 27. The process of accessing data stored in a serial access memory is similar to manipulating data on a

Mark only one oval.

- heap
- queue
- stack
- binary tree

35. 28. Which of the following data structures is linear data structure?

Mark only one oval.

- Trees
- Graphs
- Arrays
- None

36. 29. A BST is traversed in the following order recursively: Right, root, left The output sequence will be in

Mark only one oval.

- Ascending order
- Descending order
- Bitonic sequence
- No specific order

37. 30. The data structure required to check whether an expression contains balanced parenthesis is?

Mark only one oval.

- Stack
- Queue
- Array
- Tree

38. 31. Which data structure is needed to convert infix notation to postfix notation?

Mark only one oval.

- Branch
- Tree
- Queue
- Stack

39. 32. In a circular linked list

Mark only one oval.

- Components are all linked together in some sequential manner
- There is no beginning and no end
- Components are arranged hierarchically.
- Forward and backward traversal within the list is permitted.

40. 33. The best average behavior is shown by

Mark only one oval.

- Quick Sort
- Merge Sort
- Insertion Sort
- Heap Sort

41. 34. Which of the following ways is a pre-order traversal?

Mark only one oval.

- Root->left subtree-> right subtree
- Root->right subtree-> left sub tree
- right subtree-> left subtree->Root
- left subtree-> right subtree->Root

42. 35. Degree of a leaf node is

Mark only one oval.

0

1

2

3

43. 36. What are the disadvantages of arrays?

Mark only one oval.

Data structure like queue or stack cannot be implemented

There are chances of wastage of memory space if elements inserted in an array are lesser than the allocated size

Index value of an array can be negative

Elements are sequentially accessed

44. 37. Which of these is not an application of linked lists?

Mark only one oval.

To implement file systems

For separate chaining in hash-tables

To implement non-binary trees

Random Access of elements

45. 38. When a top-down approach of dynamic programming is applied to a problem, it usually _____

Mark only one oval.

- Decreases both, the time complexity and the space complexity
- Decreases the time complexity and increases the space complexity
- Increases the time complexity and decreases the space complexity
- Increases both, the time complexity and the space complexity

46. 39. Which of the following problems is NOT solved using dynamic programming?

Mark only one oval.

- 0/1 knapsack problem
- Matrix chain multiplication problem
- Edit distance problem
- Fractional knapsack problem

47. 40. Complexity of the recurrence relation $T(n)=8T(n/2)+n^2$ is

Mark only one oval.

- $O(n)$
- $O(n^2)$
- $O(n^3)$
- none of these

48. 41. Which of the following algorithm solves the All-pair shortest path algorithm

Mark only one oval.

- dijkstra's
- floydwarshall
- bellman ford
- none of these

49. 42. Which algorithm is able to detect negative edge cycle

Mark only one oval.

- Dijkstra's
- Floyd warshall
- Bellman ford
- None of these

50. 43. How many fundamental solutions are there for the eight queen puzzle?

Mark only one oval.

- 92
- 10
- 11
- 12

51. 44. In how many directions do queens attack each other?

Mark only one oval.

1

2

3

4

52. 45. What is the objective of the tower of hanoi puzzle?

Mark only one oval.

To move all disks to some other rod by following rules

To divide the disks equally among the three rods by following rules

To move all disks to some other rod in random order

To divide the disks equally among three rods in random order

53. 46. The time complexity of the solution tower of hanoi problem using recursion is _____

Mark only one oval.

$O(n^2)$

$O(2^n)$

$O(n \log n)$

$O(n)$

54. 47. Recursive solution of the tower of hanoi problem is an example of which of the following algorithms?

Mark only one oval.

- Dynamic programming
- Backtracking
- Greedy algorithm
- Divide and conquer

55. 48. What is the condition for proper coloring of a graph?

Mark only one oval.

- two vertices having a common edge should not have same color
- two vertices having a common edge should always have same color
- all vertices should have a different color
- all vertices should have same color

56. 49. The number of colors used by a proper coloring graph is called?

Mark only one oval.

- k coloring graph
- x coloring graph
- m coloring graph
- n coloring graph

57. 50. Backtracking algorithm is implemented by constructing a tree of choices called as?

Mark only one oval.

- State-space tree
- State-chart tree
- Node tree
- Backtracking tree

58. 51. Time complexity of prim's algorithm is

Mark only one oval.

- $O(V^2)$
- $O(\log V)$
- $O(E^2)$
- none of these

59. 52. A node is said to be _____ if it has a possibility of reaching a complete solution.

Mark only one oval.

- Non-promising
- Promising
- Succeeding
- Preceding

60. 53. BFS traversal uses

Mark only one oval.

- stack
- queue
- both a and b
- None of these

61. 54. $T(n) = c + T(n-1)$, with $T(1) = 1$. Time complexity is

Mark only one oval.

- $O(n)$
- $O(n^2)$
- $O(n^3)$
- None of these

62. 55. _____ enumerates a list of promising nodes that could be computed to give the possible solutions of a given problem.

Mark only one oval.

- Exhaustive search
- Brute force
- Backtracking
- Divide and conquer

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

Mark only one oval.

- n- queen problem
- subset sum problem
- knapsack problem
- Hamiltonian circuit problem

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

Mark only one oval.

- n-queen problem
- eight queens puzzle
- four queens puzzle
- 1-queen problem

65. 58. The complexity of Floyd warshall algorithm is

Mark only one oval.

- $O(V^2)$
- $O(V^3)$
- $O(E^2)$
- $O(E^3)$

66. 59. Let a chain of matrices are $A_1A_2A_3A_4A_5=(2,3,4,5,6,7)$. Total number of parenthesization possible is

Mark only one oval.

- 25
 41
 50
 None of these

67. 60. BFS of a graph $G=(V,E)$ has running time

Mark only one oval.

- $O(|V|+|E|)$
 $O(|E|)$
 $O(|V|)$
 None of these

68. 61. How many possible solutions exist for an 8-queen problem?

Mark only one oval.

- 100
 98
 99
 92

69. 62. Of the following given options, which one of the following is a correct option that provides an optimal solution for the 4-queens problem?

Mark only one oval.

- (3,1,4,2)
- (2,3,1,4)
- (4,3,2,1)
- (4,2,3,1)

70. 63. Which of the following methods can be used to solve n-queen's problem?

Mark only one oval.

- greedy algorithm
- divide and conquer
- iterative improvement
- backtracking

71. 64. Where is the n-queens problem implemented?

Mark only one oval.

- carom
- chess
- ludo
- cards

72. 65. Placing n-queens so that no two queens attack each other is called?

Mark only one oval.

- n-queen's problem
- 8-queen's problem
- Hamiltonian circuit problem
- subset sum problem

73. 66. Given items as {value,weight} pairs $\{(60,20),\{50,25\},\{20,5\}\}$. The capacity of knapsack=40. Find the maximum value output assuming items to be divisible and non-divisible respectively.

Mark only one oval.

- 100, 80
- 110, 70
- 130, 110
- 110, 80

74. 67. Given items as {value,weight} pairs $\{(40,20),\{30,10\},\{20,5\}\}$. The capacity of knapsack=20. Find the maximum value output assuming items to be divisible.

Mark only one oval.

- 60
- 80
- 100
- 40

75. 68. Time complexity of fractional knapsack problem (assume the elements are sorted according to the profit density) is _____

Mark only one oval.

- $O(n \log n)$
- $O(n)$
- $O(n^2)$
- $O(nW)$

76. 69. What is the objective of the knapsack problem?

Mark only one oval.

- To get maximum total value in the knapsack
- To get minimum total value in the knapsack
- To get maximum weight in the knapsack
- To get minimum weight in the knapsack

77. 70. Fractional knapsack problem is solved most efficiently by which of the following algorithms?

Mark only one oval.

- Divide and conquer
- Dynamic programming
- Greedy algorithm
- Backtracking

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