# 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?

- 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



- 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

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

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- 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 '?

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Prefix

- Postfix
- \_\_\_\_\_ Infix
- None None

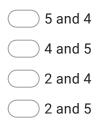
15. 8. The given array is arr = {1,2,4,3}. Bubble sort is used to sort the array elements.How many iterations will be done to sort the array?

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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.



17. 10. Which search is better?

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\_\_\_\_ 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.

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

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Merge sort
Bubble sort
Insertion sort

None

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

Mark only one oval.

- O Push
- \_\_\_\_ Рор

🔵 Retrieval

access

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

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

Mark only one oval.

$\subset$	Reverse
$\subset$	Hierarchical
(	Alternative

Sequential

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

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

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

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Overflow

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

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- 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.

- 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.



- 📃 Avail list
- Free node list
- Memory space list
- 29. 22. A doubly linked list is also called as ......

- Iinked list
- 🔵 one way chain
- two way chain
- right link

30. 23. What is a full binary tree?

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- 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?

- 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?

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$\bigcirc$	Pre-order
$\bigcirc$	In-order
$\bigcirc$	Post-order
$\bigcirc$	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.

$\square$	)	heap
$\square$	)	queue
$\square$	)	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.

$\bigcirc$	Stack
$\bigcirc$	Queue
$\bigcirc$	Array
$\bigcirc$	Tree

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

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Branch

Tree

- Queue
- \_\_\_\_) Stack

39. 32. In a circular linked list

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- 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?

- 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.



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?

- 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)+n2 is

- \_\_\_\_\_ O(n)
- O(n^2)
- (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?



- \_\_\_\_\_10
- \_\_\_\_\_11
- 12

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

Mark only one oval.



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

- O(n^2)
- 🔵 0(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?



- 🔵 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(V2)
- O(logV)
- 0(E2)
- 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.

- 0(n) 0(n^2)
- \_\_\_\_\_ O(n3)
- None of these
- 62. 55. \_\_\_\_\_\_ enumerates a list of promising nodes that could be computed to give the possible solutions of a given problem.

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

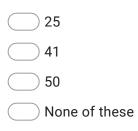
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- 🔵 n-queen problem
- eight queens puzzle
- \_\_\_\_\_ four queens puzzle
- 1-queen problem
- 65. 58. The complexity of Floyd warshall algorithm is

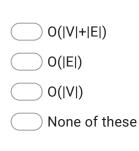
- O(V^2)
- (V^3)
- 0(E^2)
- O(E^3)

66. 59. Let a chain of matrices are A1A2A3A4A5=(2,3,4,5,6,7).Total number of parenthesization possible is

Mark only one oval.



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



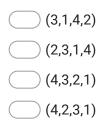
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68. 61. How many possible solutions exist for an 8-queen problem?

- \_\_\_\_\_\_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.



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?

- \_\_\_\_ 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
- Bamiltonian 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.

- 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)
- \_\_\_\_\_ 0(n2)
- \_\_\_\_\_ 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?

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

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