

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

Course Name - --Data Structures

Course Code - BCAC201

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Answer all the questions. Each question carry one mark.

9. 1. The condition \_\_\_\_\_ indicate the queue is empty.

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- Front=NULL
- Null=Front
- Front=Rear
- Rear=NULL

10. 2. A binary search tree is generated by inserting in order the following integers: 50, 15, 62, 5, 20, 58, 91, 3, 8, 37, 60, 24 The number of the node in the left sub-tree and right sub-tree of the root, respectively, is

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- (4, 7)
- (7, 4)
- (8, 3)
- (3, 8)

11. 3. One can convert a binary tree into its mirror image by traversing it in

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- in-order
- pre-order
- post-order
- any order

12. 4. Which of the following ways is a pre-order traversal?

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

13. 5. The memory address of the first element of an array is called

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- base address
- floor address
- foundation address
- first address

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

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- FIRST
- FRONT
- TOP
- REAR

15. 7. In a full binary tree if there are L leaves, then total numbers of nodes N are?

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- $N = 2 * L$
- $N = L + 1$
- $N = L - 1$
- $N = 2 * L - 1$

16. 8. The element that is going to be searched in a list is called \_\_\_\_\_.

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- Key
- Item
- Table
- File

17. 9. The depth of a complete binary tree with 'n nodes is (log is to be base two)

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- $\log(n+1)-1$
- $\log(n)$
- $\log(n-1) + 1$
- $\log(n) + 1$

18. 10. Which of the following is not an in-place sorting algorithm?

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- Insertion sort
- Selection sort
- Bubble sort
- Merge sort

19. 11. How is Data in a queue accessed?

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- First in First out
- First in Last out
- Last in First out
- Last in Last out

20. 12. The number of edges from the node to the deepest leaf is called \_\_\_\_\_ of the tree.

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- Lower bound
- One that is sandwiched between the two bounds
- Upper bound
- None of these

21. 13. Which of the following algorithm pays the least attention to the ordering of the elements in the input list?

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- Insertion sort
- Selection sort
- Quick sort
- Merge sort



22. 14. If the given input array is sorted or nearly sorted, which of the following algorithm gives the best performance?

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- Insertion sort
- Selection sort
- Quick sort
- Merge sort

23. 15. To obtain a prefix expression, which of the tree traversals is used?

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

24. 16. Which of the following traversal techniques lists the elements of a binary search tree in ascending order ?

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- Pre-order
- Post-order
- In order
- None of these

25. 17. \_\_\_\_\_ is a pile in which items are added at one end and removed from the other.

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- List
- Queue
- Stack
- Array

26. 18. Which of the following is not an application of binary search? a. b. c. d.

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- To find the lower/upper bound in an ordered sequence
- Union of intervals
- Debugging
- To search in unordered list

27. 19. Which data structure allows deleting data elements from front and inserting at the rear?

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- Stack
- Queue
- List
- None of these

28. 20. Which of the following is not an advantage of optimized bubble sort over other sorting techniques in case of sorted elements?

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- It is faster
- Consumes less memory
- Detects whether the input is already sorted
- Consumes less time

29. 21. What is the advantage of recursive approach than an iterative approach?

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- Consumes more memory
- Consumes less memory
- Less code and easy to implement
- More code has to be written

30. 22. If  $n$  elements are sorted in a balanced binary search tree. What would be the asymptotic complexity to search a key in the tree?

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- $O(1)$
- $O(n)$
- $O(\log n)$
- $O(n \log n)$

31. 23. Finding the location of a given item in a collection of items is called

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- Discovering
- Finding
- Searching
- Mining

32. 24. \_\_\_\_\_ 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

33. 25. Binary Search can be categorized into which of the following?

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- Brute Force technique
- Divide and conquer
- Greedy algorithm
- Dynamic programming

34. 26. The maximum number of binary trees that can be formed with three unlabeled nodes is:

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- 1
- 6
- 5
- 4

35. 27. The recurrence relation that arises in relation with the complexity of binary search is:

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- $T(n) = 2T(n/2) + k$ , where  $k$  is constant
- $T(n) = T(n/2) + k$ , where  $k$  is constant
- $T(n) = T(n/2) + \log n$
- $T(n) = T(n/2) + n$

36. 28. Identify the data structure which allows deletions at both ends of the list but insertion at only one ending.

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- Input-restricted deque
- Output-restricted deque
- Priority Queues
- None of these

37. 29. Deletion operation is done using \_\_\_\_\_ in a queue.

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- Front
- Rear
- Top
- List

38. 30. The no of external nodes in a full binary tree with n internal nodes is?

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- 1
- n
- n+1
- 2n

39. 31. If a key is found in a list that is called \_\_\_\_\_ type of search.

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- unsuccessful
- successful
- partial success
- partial unsuccessful

40. 32. A binary tree is generated by inserting in order the following integers: 50, 15, 62, 5, 20, 58, 91, 3, 8, 37, 60, 24. The number of nodes in the left and right of the root respectively is:

*Mark only one oval.*

(4,7)

(7,4)

(6,3)

(3,6)

41. 33. What is the output of the following code snippet? `#include void main() {int arr[5]={1,2,3,4,5}; int*ptr=arr;printf("%d",*ptr); }`

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2

5

1

4

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

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Merge sort

Quick Sort

Insertion sort

None of these

43. 35. What is a complete binary tree?

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- Each node has exactly zero or two children
- A binary tree, which is completely filled, with the possible exception of the bottom level, which is filled from right to left
- A binary tree, which is completely filled, with the possible exception of the bottom level, which is filled from left to right
- A tree in which all nodes have degree 2

44. 36. In \_\_\_\_\_ search start at the beginning of the list and check every element in the list.

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

45. 37. What is the worst case time complexity for search, insert and delete operations in a general Binary Search Tree?

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- $O(n)$  for all
- $O(\log n)$  for all
- $O(\log n)$  for search and insert, and  $O(n)$  for delete
- $O(\log n)$  for search, and  $O(n)$  for insert and delete



46. 38. Which type of traversal of binary search tree outputs the value in sorted order?

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

47. 39. Which of the following require additional space to sort?

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- Merge sort
- Bubble sort
- Selection sort
- Insertion sort.

48. 40. Which is / are application(s) of stack?

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- Function call
- Large number arithmetic
- Evaluation of arithmetic expression
- All of these

49. 41. Which search technique is better for sorted elements?

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- Linear
- Binary
- Both linear and binary
- None of these

50. 42. A \_\_\_\_\_ is a data structure that organizes data similar to a line in the supermarket, where the first one in line is the first one out.

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- Stacks linked list
- Both of them
- Neither of them
- queue linked list

51. 43. Which search technique is better?

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- Linear
- Binary
- all of these
- none of these

52. 44. When a binary tree is converted in to an extended binary tree, all the nodes of a binary tree in the external node becomes

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- Root node
- External node
- Internal nodes
- None of these

53. 45. A binary search tree whose left subtree and right subtree differ in height by at most 1 unit is called

*Mark only one oval.*

- Lemma tree
- Redblack tre
- AVL tree
- None of these.

54. 46. 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

55. 47. Finding the location of the element with a given value is:

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- Traversal
- Search
- Sort
- None of these

56. 48. The complexity of Bubble sort algorithm is

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

57. 49. What is the time complexity of uniform binary search?

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

58. 50. If  $n$  numbers are to be sorted in ascending order in  $O(n \log n)$  time, which of the following tree can be used

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- Binary tree
- Binary search tree
- Max -heap
- Min -heap

59. 51. Consider a sorted array of  $n$  numbers. What would be the time complexity of the best known algorithm to find a pair 'a' and 'b' such that  $|a-b| = k$ ,  $k$  being a positive integer.

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- $O(n)$
- $O(n \log n)$
- $O(\log n)$
- None of these

60. 52. The dummy header in the linked list contains

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- First record of the actual data
- Last record of the actual data
- Pointer to the last record of the actual data
- None of these.

61. 53. Before inserting into the stack one must check the condition \_\_\_\_\_

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- Overflow
- Underflow
- Maximum elements
- Existing elements

62. 54. In a full binary tree, every internal node has exactly two children. A full binary tree with  $2n+1$  nodes contains

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- $n$  leaf node
- $n$  internal nodes
- $n-1$  leaf nodes
- $n-1$  internal nodes

63. 55. In linear search with array, how many comparisons are needed in best case?

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- 0
- 1
- $n$
- $n/2$

64. 56. Which of the following traversal techniques lists the elements of a binary search tree in ascending order ?

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- Pre-order
- Post-order
- In order
- None of these

65. 57. If two strings are identical, the strcmp()function returns \_\_\_\_

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- 0
- 1
- 1
- True

66. 58. The retrieval of items in a stack is \_\_\_\_\_ operation.

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- Push
- Pop
- Retrieval
- Access

67. 59. In a full binary tree if number of internal nodes is  $I$ , then number of leaves  $L$  is?

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$L = 2 \cdot I$

$L = I + 1$

$L = I - 1$

$L = 2 \cdot I - 1$

68. 60. What is the space complexity of an array having  $n$  elements?

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$O(n)$

$O(n \log n)$

$O(\log n)$

$O(1)$

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