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1	Online E-Learning Platform Hub	React+Springboot+MySql
2	PG Mates / RoomSharing / Flat Mates	React+Springboot+MySql
3	Tour and Travel management System	React+Springboot+MySql
4	Election commition of India (online Voting System)	React+Springboot+MySql
5	HomeRental Booking System	React+Springboot+MySql
6	Event Management System	React+Springboot+MySql
7	Hotel Management System	React+Springboot+MySql
8	Agriculture web Project	React+Springboot+MySql
9	AirLine Reservation System / Flight booking System	React+Springboot+MySql
10	E-commerce web Project	React+Springboot+MySql
11	Hospital Management System	React+Springboot+MySql
12	E-RTO Driving licence portal	React+Springboot+MySql
13	Transpotation Services portal	React+Springboot+MySql
14	Courier Services Portal / Courier Management System	React+Springboot+MySql
15	Online Food Delivery Portal	React+Springboot+MySql
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17	Gym Management System	React+Springboot+MySql
18	Bike/Car ental System Portal	React+Springboot+MySql
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26	Marriage Hall Booking Project	React+Springboot+MySql
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28	Resturant management System	React+Springboot+MySql
29	Solar Management Project	React+Springboot+MySql
30	OneStepService LinkLabourContractor	React+Springboot+MySql
31	Vehical Service Center Portal	React+Springboot+MySql
32	E-wallet Banking Project	React+Springboot+MySql
33	Blogg Application Project	React+Springboot+MySql
34	Car Parking booking Project	React+Springboot+MySql
35	OLA Cab Booking Portal	React+NextJs+Springboot+MySql
36	Society management Portal	React+Springboot+MySql
37	E-College Portal	React+Springboot+MySql
38	FoodWaste Management Donate System	React+Springboot+MySql
39	Sports Ground Booking	React+Springboot+MySql
40	BloodBank mangement System	React+Springboot+MySql

41	Bus Tickit Booking Project	React+Springboot+MySql
42	Fruite Delivery Project	React+Springboot+MySql
43	Woodworks Bed Shop	React+Springboot+MySql
44	Online Dairy Product sell Project	React+Springboot+MySql
45	Online E-Pharma medicine sell Project	React+Springboot+MySql
46	FarmerMarketplace Web Project	React+Springboot+MySql
47	Online Cloth Store Project	React+Springboot+MySql
48	Train Ticket Booking Project	React+Springboot+MySql
49	Quizz Application Project	JSP+Springboot+MySql
50	Hotel Room Booking Project	React+Springboot+MySql
51	Online Crime Reporting Portal Project	React+Springboot+MySql
52	Online Child Adoption Portal Project	React+Springboot+MySql
53	online Pizza Delivery System Project	React+Springboot+MySql
54	Online Social Complaint Portal Project	React+Springboot+MySql
55	Electric Vehical management system Project	React+Springboot+MySql
56	Online mess / Tiffin management System Project	React+Springboot+MySql
57		React+Springboot+MySql
58		React+Springboot+MySql
59		React+Springboot+MySql
60		React+Springboot+MySql

Spring Boot + React JS + MySQL Project List

Sr.No	Project Name	YouTube Link
1	Online E-Learning Hub Platform Project	https://youtu.be/KMjyBaWmgzg?si=YckHuNzs7eC84-IW
2	PG Mate / Room sharing/Flat sharing	https://youtu.be/4P9clHg3wvk?si=4uEsi0962CG6Xodp
3	Tour and Travel System Project Version 1.0	https://youtu.be/-UHOBywHaP8?si=KHHfE_A0uv725f12
4	Marriage Hall Booking	https://youtu.be/VXz0kZQi5to?si=ILOS-QG3TpAFP5k7
5	Ecommerce Shopping project	https://youtu.be/vJ_C6LkhrZ0?si=YhcBylSErvdn7paq
6	Bike Rental System Project	https://youtu.be/FlzsAmIBCbk?si=7ujQTJqEgkQ8ju2H
7	Multi-Restaurant management system	https://youtu.be/pvV-pM2Jf3s?si=PgvnT-yFc8ktrDxB
8	Hospital management system Project	https://youtu.be/lynlouBZvY4?si=CXzQs3BsRkjKhZCw
9	Municipal Corporation system Project	https://youtu.be/cVMx9NVyl4I?si=qX0oQt-GT-LR_5jF
10	Tour and Travel System Project version 2.0	https://youtu.be/_4u0mB9mHXE?si=gDiAhKBowi2gNUKZ

Sr.No	Project Name	YouTube Link
11	Tour and Travel System Project version 3.0	https://youtu.be/Dm7nOdpasWg?si=P_Lh2gcOFhlyudug
12	Gym Management system Project	https://youtu.be/J8_7Zrkg7ag?si=LcxV51ynfUB7OptX
13	Online Driving License system Project	https://youtu.be/3yRzsMs8TLE?si=JRI_z4FDx4Gmt7fn
14	Online Flight Booking system Project	https://youtu.be/m755rOwdk8U?si=HURvAY2VnizlyJlh
15	Employee management system project	https://youtu.be/ID1iE3W_GRw?si=Y_jv1xV_BljhrD0H
16	Online student school or college portal	https://youtu.be/4A25aEKfei0?si=RoVgZtxMk9TPdQvD
17	Online movie booking system project	https://youtu.be/Lfjv_U74SC4?si=fiDvrhhrjb4KSIsm
18	Online Pizza Delivery system project	https://youtu.be/Tp3izreZ458?si=8eWAOzA8SVdNwlyM
19	Online Crime Reporting system Project	https://youtu.be/0UlzReSk9tQ?si=6vN0e70TVY1GOwPO
20	Online Children Adoption Project	https://youtu.be/3T5HC2HKyT4?si=bntP78niYH802I7N

1. What is a data structure?

1. Programming language
2. Database Design
3. **Storage and Data Organization Technique**
4. collection of algorithms

Ans. Data Structure is storing and organizing data in the computer memory. It is the branch of computer science that deals with arranging large datasets in such a manner that they can be accessed and modified as per the requirements.

Read More: What are Data Structures - Types of Data Structures (Complete Guide)

2. The insertion operation in the stack is known as:

1. Add
2. **Push**
3. Insert
4. Interpolate

Ans. Pushing means inserting an element at the top of the stack.

3. How can array elements be accessed?

1. **randomly**
2. sequentially
3. exponentially
4. logarithmically

Ans. The array elements are stored at contiguous memory locations that can be randomly accessed with their index number.

4. Which of the following cases does not exist in complexity theory?

1. Best case
2. Worst case
3. Average case
4. **Empty Case**

5. Which data structure is based on the First In Last Out (FILO) principle?

1. Queue
2. Stack
3. Tree
4. Graph

Ans. The last inserted element is available first and is the first one to be deleted. Hence, it is known as Last In, First Out LIFO, or First In, Last Out FILO.

6. The prefix form of $((a/b)+c)-(d+(e*f))$ is?

1. $- + / a b c + d * e f$
2. $+ - / a b c + d * e f$
3. $- + a / b c d + * e f$
4. $- / a b + c + d * e f$

Ans. Let's see the step-by-step conversion of the infix expression, $((a/b)+c)-(d+(e*f))$ into prefix:

1. Reverse the Infix Expression: $((f*e)+d)-(c+(b/a))$
2. Interchange '(' with ')' and vice versa: $((f*e)+d)-(c+(b/a))$
3. Apply postfix

Expression	Stack	Operation	Output
$((f*e)+d)-(c+(b/a))$	(	Push	
$(f*e)+d)-(c+(b/a))$	((	Push	
$f*e)+d)-(c+(b/a))$	((		f
$*e)+d)-(c+(b/a))$	((*	Push	f
$e)+d)-(c+(b/a))$	((*	-	fe
$)d)-(c+(b/a))$	((	Pop	fe*
$+d)-(c+(b/a))$	((+	Push	fe*
$d)-(c+(b/a))$	((+		fe*d
$)-(c+(b/a))$	((	Pop	fe*d+
$-(c+(b/a))$	((-	Push	fe*d+
$(c+(b/a))$	(((-	Push	fe*d+
$c+(b/a))$	(((-		fe*d+c
$+(b/a))$	(((-+	Push	fe*d+c
$(b/a))$	(((-+(	Push	fe*d+c

b/a))	((-(+(		fe*d+cb
/a))	((-(+(/	Push	fe*d+cb
a))	((-(+(/		fe*d+cba
))	((-(+(	Pop	fe*d+cba/
)	((-(	Pop	fe*d+cba/+
		Pop	fe*d+cba/+-

4. Reverse the postfix expression to get the prefix.

Read More: Implementing Stack in Data Structures

7. Which of the following applications uses a circular linked list?

1. Recursive function calls
2. Undo operation in a text editor
3. Implement Hash Tables
4. **Allocating CPU to resources**

Ans. Round Robin is employed to allocate CPU time to resources using the circular linked list data structure.

8. What's the worst-case scenario in a linear search algorithm?

1. The element is somewhere in the middle of the array
2. The element is not present in the array
3. The element is the last in the array
4. **Either the element is the last in the array or is not there**

9. Which of the following is not a balanced binary tree?

1. Splay tree
2. **B-tree**
3. AVL tree
4. Red-black tree

Ans. B-Tree is a self-balancing tree where a node can have more than two children

Read More: B Tree: An Efficient Data Structure

10. Which of the following is not a type of queue?

1. Priority queue
2. Circular queue
3. **Single-ended queue**
4. Ordinary queue

Ans. A queue is an ordered list in which insertion is done at one end and deletion at another.

11. The complexity of the average case of an algorithm is

1. **more complicated to analyze than the worst-case**
2. Much simpler to analyze than the worst-case
3. Sometimes more complicated and some other times simpler than the worst-case
4. None of the above




12. The time complexity of the dequeue operation in a queue is

1. **$O(1)$**
2. $O(n)$
3. $O(\text{long})$
4. $O(n \log n)$

Ans. The dequeue operation involves removing the front element and updating the front pointer.

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13. How will you increment the rear end in a circular queue?

1. $\text{rear} = \text{rear} + 1$
2. **$(\text{rear} + 1) \% \text{max}$**

3. $(\text{rear} \% \text{max}) + 1$
4. None of the above

Ans. The rear value will be from 0 to $\text{max}-1$. max is the total size of the circular queue. $\text{rear} + 1$ moves the rear pointer to the next position. $(\text{rear}+1) \% \text{max}$ will point to the first position in the queue maintaining the circular nature.

14. What would be the time complexity to find an element in the linked list?

1. $O(1)$
2. **$O(n)$**
3. $O(n^2)$
4. $O(n^4)$

Ans. If the element is at the end of the linked list, we have to traverse through all the linked list elements.

15. Which sorting algorithm can sort a random linked list with minimum time complexity?

1. Insertion Sort
2. Quick Sort
3. Heap Sort
4. **Merge Sort**

Ans. The worst-case time complexity of **Merge Sort** is $O(n \log n)$. Here, n is the number of elements in the linked list.

16. A one-dimensional array containing one-dimensional arrays is called

1. **Two-dimensional array**
2. Multi-casting array
3. Multi-dimensional array
4. Three-dimensional array

17. The data structure used to check whether an expression contains a balanced parenthesis is?

1. Queue
2. **Stack**
3. Tree

4. Array

Ans. Stack works according to the LIFO principle. Open parenthesis are pushed into the stack, and closed parenthesis pop out elements until the top element of the stack is its corresponding open parenthesis. If the stack is empty, the parenthesis are balanced.

18. Which algorithm stops the execution when it finds the solution otherwise start the problem from the top?

- 1. **Backtracking**
- 2. Divide and conquer
- 3. Branch and Bound
- 4. Dynamic programming

Ans. Backtracking solves the problem recursively and removes the solution if it does not satisfy the problem constraints. Whenever a solution fails we trace back to the failure point, build on the next solution, and continue this process till we find the solution or all possible solutions are looked after.

19. Which of the following data structures does the Tower of Hanoi algorithm use?

- 1. Queue
- 2. Linked List
- 3. Heap
- 4. **Stack**

20. A binary search algorithm cannot be applied to

- 1. **Sorted linked list**
- 2. Sorted linear array
- 3. Sorted binary tree
- 4. Pointer array

Ans. A binary search algorithm cannot be efficiently applied to a sorted linked list because it relies on random access to elements, which is a key feature of arrays but not linked lists.

21. What is an AVL tree?

- 1. an unbalanced and height-balanced tree
- 2. **a balanced and height-balanced tree**
- 3. a tree with at most 3 children

4. a tree with three children

Ans. AVL tree is a popular self-balancing binary search tree where the difference between the heights of left and right subtrees for any node does not exceed one. It automatically adjusts its structure to maintain the minimum possible height after any operation with the help of a balance factor for each node.

22. In a max-heap, the element with the greatest key is always in which node?

- 1. Leaf node
- 2. First node of left sub-tree
- 3. **root node**
- 4. First node of the right sub-tree

Ans. In a max-heap, all the nodes (including the root) are greater than their respective child nodes. The key of the root node is always the largest among all other nodes.

23. In a binary search tree, which traversals would print the numbers in ascending order?

- 1. Level-order traversal
- 2. Pre-order traversal
- 3. Post-order traversal
- 4. **In-order traversal**

Ans. In a binary search tree, each left subtree has values below the root and each right subtree has values above the root. An in-order traversal first visits the left child, then visits the node, and finally, the right child.

Read More: Binary Search Tree in Data Structures

24. When do you prefer Red-black trees over AVL trees?

- 1. **when there are more insertions or deletions**
- 2. when a large search operation is required
- 3. when the tree must be balanced
- 4. when $\log(\text{nodes})$ time complexity is needed

Ans. Red-Black Trees require fewer rotations to maintain balance. On average, a Red-Black Tree requires at most 2 rotations for insertion and 3 rotations for deletion, while AVL Trees may require more rotations.

25. A graph with all vertices having equal degree is known as a

1. Multi Graph
2. **Regular Graph**
3. Simple Graph
4. Complete Graph

Ans. Regular Graph is an undirected graph where every vertex has the same number of edges or neighbors.

26. What is the term used when several elements compete for the same location in the hash table?

1. Diffusion
2. Replication
3. **Collision**
4. Duplication

Ans. A hash collision refers to a situation where two different inputs produce the same hash value or hash code when processed by a hash function.

27. A full binary tree can be generated using

1. **post-order and pre-order traversal**
2. pre-order traversal
3. post-order traversal
4. in-order traversal

Ans. A full binary tree is a tree in which every node has either 0 or 2 children.

28. B+ Trees are called balanced trees because

1. **the lengths of the paths from the root to all leaf nodes are equal.**
2. the lengths of the paths from the root to all leaf nodes differ from each other by at most 1
3. the number of children of any two non-leaf sibling nodes differs by at most 1
4. the number of records in any two leaf nodes differs by at most 1

29. An algorithm design method is used when the solution to a problem can be viewed as the result of a sequence of decisions

1. **Dynamic programming**
2. Backtracking
3. Branch and bound
4. Greedy method

Ans. This algorithm uses the already found solution to avoid repetitive calculation of the same part of the problem. It divides the problem into smaller overlapping subproblems, solves them, and stores the intermediate results.

30. Which algorithm type is used in solving the 4 Queens problem?

1. Greedy
2. Dynamic
3. Branch and Bound
4. **Backtracking**

31. Given an undirected graph G with V vertices and E edges, what will be the sum of the degrees of all vertices?

1. E
2. **$2E$**
3. $V + E$
4. $2V$

Ans. The degree of a vertex in a graph is the number of edges connected to that vertex.

Read More: Graphs in Data Structures - Types of Graphs, Representation & Operations

32. The necessary condition to be checked before deletion from the queue is

1. Overflow
2. **Underflow**
3. Rear value
4. Front value

Ans. Before deletion, we need to check whether the queue is empty or not.

33. BFS is best compared to DFS in the case of

1. The graph's width is large
2. **The graph's depth is large**
3. The graph consists of many nodes
4. The graph is complex

Ans. BFS explores all nodes at the present "depth" level before moving on to nodes at the next depth level. This ensures that the first time BFS reaches a node, it has found the shortest path to that node (in terms of the number of edges).

Read More: Breadth First Search vs Depth First Search

34. One of the differences between a queue and a stack is:

1. Queues require dynamic memory, but stacks do not.
2. Stacks require dynamic memory, but queues do not.
3. **Queues use two ends of the structure; stacks use only one.**
4. Stacks use two ends of the structure, and queues use only one

Ans. The stack has only one end, the top, at which both insertion and deletion take place. A queue has two ends, rear and front, for insertion and deletion respectively.

35. Which array operations have a time complexity of $O(1)$?

1. Searching any element
2. **Accessing any element**
3. Inserting an element
4. deleting an element

Ans. Accessing an element in an array can be done through indexing. So, it takes very little time.

36. What is the number of edges in a graph's minimum spanning tree with N vertices and E edges?

1. $E - 1$
2. **$N - 1$**
3. $N + E - 1$
4. $N + E - 2$

Ans. The number of edges in a spanning tree is equal to the number of nodes or vertices minus one i.e.

n-1.

37. What is the time complexity of the merge sort algorithm?

1. $O(n)$
2. $O(n^2)$
3. $O(\log n)$
4. **$O(n \log n)$**

38. A self-balancing binary search tree can be used to implement

1. **Priority queue**
2. Hash table
3. Heap sort
4. Priority queue and Heap sort

Ans. A self-balancing binary search tree can implement a priority queue by efficiently managing insertions, deletions, and minimum/maximum element retrieval in $O(\log n)$ time.

39. What would be the color of a newly created node while inserting a new element in a Red-black tree?

1. Black, if the new node is not a root node
2. Red, if the new node is not a root node
3. Black, if the new node is a root node
4. **Both b and c**

Ans. If the newly created node is a root node, then it will be Black; otherwise, it will be Red.

40. Which one of the following algorithms does not return the optimal solution?

1. Dynamic Programming
2. **Backtracking**
3. Branch and Bound
4. Greedy Method

Ans. Backtracking solves the problem recursively and removes the solution if it does not satisfy the constraints of a problem. Whenever a solution fails we trace back to the failure point, build on the next solution, and continue this process till we find the solution or all possible solutions are looked after.

41. In a priority queue, insertion and deletion takes place at

1. front, rear end
2. only at the rear end
3. only at the front end
4. **any position**

Ans. In a priority queue, insertion takes place at the appropriate position to maintain the heap property, and deletion takes place at the root or the corresponding node.

42. $O(n)$ means computing time is

1. Constant
2. Quadratic
3. **Linear**
4. Cubic

Ans. $O(n)$ means the computing time grows linearly with the input size n .

43. The total number of comparisons in a bubble sort is

1. **$n(n-1)/2$**
2. $2n$
3. n^2
4. n^3

Ans. The **bubble sort algorithm** repeatedly compares the adjacent elements, from left to right, and swaps them if they are out-of-order.

44. Which of the following is not an application of binary search?

1. To find the lower/upper bound in an ordered sequence
2. Union of intervals
3. Debugging
4. **To search in an unordered list**

Ans. Binary Search is a searching algorithm that searches for an element's position in a sorted array only.

45. What makes selection sorting different from other sorting techniques?

1. **It requires no additional storage space**
2. It is scalable
3. It works best for already-sorted inputs
4. It is faster than any other sorting technique

Ans. Selection sort is an in-place comparison sort algorithm. In-place sorting algorithms rearrange the elements within the array that is to be sorted, without using any additional space or memory.

Read More: Selection Sort in Data Structures

46. A linearly ordered sequence of memory cells is known as

1. **node**
2. link
3. variable
4. null

47. Associative arrays can be implemented using

1. B-tree
2. A doubly linked list
3. A single linked list
4. **A self-balancing binary search tree**

Ans. Associative arrays can be implemented using self-balancing binary search trees like AVL trees or Red-Black trees.

48. What is the worst-case time complexity of binary search using recursion?

1. **$O(\log n)$**
2. $O(n)$
3. $O(n^2)$
4. $O(n \log n)$

49. What is the advantage of a recursive approach over an iterative approach?

1. Consumes less memory
2. **Less code and easy to implement**

- 3. Consumes more memory
- 4. More code has to be written

50. What is the hash function used in the division method?

- 1. $h(k) = k/m$
- 2. **$h(k) = k \bmod m$**
- 3. $h(k) = m/k$
- 4. $h(k) = m \bmod k$

Ans. The **hash function in Data Structures** is a function that takes a key and returns an index into the hash table. After that, it returns the value stored at that index which is known as the hash value.

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1. Which of the following data structure is non-linear type?

- A) Strings
- B) Lists
- C) Stacks
- D) Tree

2. Which of the following data structure is linear type?

- A) Array
- B) Tree
- C) Graphs
- D) Hierarchy

3. The logical or mathematical model of a particular organization of data is called a

- A) Data structure
- B) Data arrangement
- C) Data configuration
- D) Data formation

4. The simplest type of data structure is

- A) Multidimensional array
- B) Linear array
- C) Two-dimensional array
- D) Three-dimensional array

5. Linear arrays are also called

- A) Straight line array
- B) One-dimensional array
- C) Vertical array
- D) Horizontal array

6. Arrays are best data structures

- A) For relatively permanent collections of data.
- B) For the size of the structure and the data in the structure are constantly changing
- C) For both of above situation
- D) For none of the above

7. Which of the following data structures are indexed structures?

- A) Linear arrays
- B) Linked lists
- C) Graphs
- D) Trees

8. Each node in a linked list has two pairs of and

- A) Link field and information field
- B) Link field and avail field
- C) Avail field and information field
- D) Address field and link field

9. A does not keep track of address of every element in the list.

- A) Stack
- B) String
- C) Linear array
- D) Queue

10. When does top value of the stack changes?
A) Before deletion
B) While checking underflow
C) At the time of deletion
D) After deletion

Answers:

1. Which of the following data structure is non-linear type?
D) Tree

2. Which of the following data structure is linear type?
A) Array

3. The logical or mathematical model of a particular organization of data is called a
A) Data structure

4. The simplest type of data structure is
B) Linear array

5. Linear arrays are also called
B) One-dimensional array

6. Arrays are best data structures
A) For relatively permanent collections of data.

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8. Each node in a linked list has two pairs of and
A) Link field and information field

9. A does not keep track of address of every element in the list.
C) Linear array

10. When does top value of the stack changes?
D) After deletion

1. Which if the following is/are the levels of implementation of data structure
- A) Abstract level
 - B) Application level
 - C) Implementation level
 - D) All of the above
2. A binary search tree whose left subtree and right subtree differ in height by at most 1 unit is called
- A) AVL tree
 - B) Red-black tree
 - C) Lemma tree
 - D) None of the above
3. level is where the model becomes compatible executable code
- A) Abstract level
 - B) Application level
 - C) Implementation level
 - D) All of the above
4. Stack is also called as
- A) Last in first out
 - B) First in last out
 - C) Last in last out
 - D) First in first out
5. Which of the following is true about the characteristics of abstract data types?
- i) It exports a type.
 - ii) It exports a set of operations
- A) True, False
 - B) False, True
 - C) True, True
 - D) False, False
6. is not the component of the data structure.
- A) Operations
 - B) Storage Structures
 - C) Algorithms
 - D) None of the above
7. Which of the following is not the part of ADT description?
- A) Data
 - B) Operations
 - C) Both of the above
 - D) None of the above
8. Inserting an item into the stack when stack is not full is called Operation and deletion of item form the stack, when stack is not empty is calledoperation.
- A) push, pop
 - B) pop, push
 - C) insert, delete
 - D) delete, insert
9. Is a pile in which items are added at one end and removed from the other.
- A) Stack
 - B) Queue

- C) List
- D) None of the above

10. is very useful in situation when data have to stored and then retrieved in reverse order.

- A) Stack
- B) Queue
- C) List
- D) Link list

11. Which data structure allows deleting data elements from and inserting at rear?

- A) Stacks
- B) Queues
- C) Dequeues
- D) Binary search tree

12. Which of the following data structure can't store the non-homogeneous data elements?

- A) Arrays
- B) Records
- C) Pointers
- D) Stacks

13. 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.

- A) Queue linked list
- B) Stacks linked list
- C) Both of them
- D) Neither of them

14. Which of the following is non-liner data structure?

- A) Stacks
- B) List
- C) Strings
- D) Trees

15. Herder node is used as sentinel in

- A) Graphs
- B) Stacks
- C) Binary tree
- D) Queues

16. Which data structure is used in breadth first search of a graph to hold nodes?

- A) Stack
- B) queue
- C) Tree
- D) Array

17. Identify the data structure which allows deletions at both ends of the list but insertion at only one end.

- A) Input restricted dequeue
- B) Output restricted qequeue
- C) Priority queues
- D) Stack

18. Which of the following data structure is non linear type?

- A) Strings
- B) Lists

- C) Stacks
- D) Graph

19. Which of the following data structure is linear type?

- A) Graph
- B) Trees
- C) Binary tree
- D) Stack

20. To represent hierarchical relationship between elements, Which data structure is suitable?

- A) Dequeue
- B) Priority
- C) Tree
- D) Graph

Answers:

1. D) All of the above
2. A) AVL tree
3. C) Implementation level
4. A) Last in first out
5. C) True, True
6. D) None of the above
7. D) None of the above
8. A) push, pop
9. B) Queue
10. A) Stack
11. B) Queues
12. A) Arrays
13. A) Queue linked list
14. D) Trees
15. C) Binary tree
16. B) queue
17. A) Input restricted dequeue
18. D) Graph
19. D) Stack
20. C) Tree

1. Which of the following is not the type of queue?
A) Ordinary queue
B) Single-ended queue
C) Circular queue
D) Priority queue

2. The property of a binary tree is
A) The first subset is called the left subtree
B) The second subtree is called right subtree
C) The root cannot contain NULL
D) The right subtree can be empty

3. State true or false.
i) The degree of root node is always zero.
ii) Nodes that are not root and not leaf are called as internal nodes.
A) True, True
B) True, False
C) False, True
D) False, False

node is the path from the root to the node is called
A) Successor node
B) Ancestor node
C) Internal node
D) None of the above

5. State true of false.
i) A node is a parent if it has successor nodes.
ii) A node is child node if out degree is one.
A) True, True
B) True, False
C) False, True
D) False, False

6. is not an operation performed on linear list
a) Insertion b) Deletion c) Retrieval d) Traversal
A) only a,b and c
B) only a and b
C) All of the above
D) None of the above

7. Which is/are the application(s) of stack
A) Function calls
B) Large number Arithmetic
C) Evaluation of arithmetic expressions
D) All of the above

..... is an acyclic digraph, which has only one node with indegree 0, and other nodes have in-degree 1.
A) Directed tree
B) Undirected tree
C) Dis-joint tree
D) Direction oriented tree

9. Is a directed tree in which out-degree of each node is less than or equal to two.
A) Unary tree

4. Any

8. A

- B) Binary tree
- C) Trinary tree
- D) Both B and C

10. State true or false.

i) An empty tree is also a binary tree.

ii) In strictly binary tree, the out-degree of every node is either 0 or 2.

- A) True, False
- B) False, True
- C) True, True
- D) False, False

11. Which of the following data structures are indexed structures?

- A. Linear arrays
- B. Linked lists
- C. Queue
- D. Stack

12. Which

of the following data structure store the homogeneous data elements?

- A. Arrays
- B. Records
- C. Pointers
- D. Lists

13. When new data are to be inserted into a data structure, but there is not available space; this situation is usually called

- A. Underflow
- B. overflow
- C. houseful
- D. saturated

14. A data structure where elements can be added or removed at either end but not in the middle is called ...

- A. linked lists
- B. stacks
- C. queues
- D. dequeue

15. Operations on a data structure may be

- A. creation
- B. destruction
- C. selection
- D. all of the above

16. The way in which the data item or items are logically related defines

- A. storage structure
- B. data structure
- C. data relationship
- D. data operation

17. Which of the following are the operations applicable an primitive data structures?

- A. create
- B. destroy
- C. update
- D. all of the above

18. The use of pointers to refer elements of a data structure in which elements are logically adjacent is
- A. pointers
 - B. linked allocation
 - C. stack
 - D. queue
19. Arrays are best data structures
- A. for relatively permanent collections of data
 - B. for the size of the structure and the data in the structure are constantly changing
 - C. for both of above situation
 - D. for non of above situation
20. Which of the following statement is false?
- A. Arrays are dense lists and static data structure.
 - B. Data elements in linked list need not be stored in adjacent space in memory
 - C. Pointers store the next data element of a list.
 - D. Linked lists are collection of the nodes that contain information part and next pointer.

Answers:

- 1. B) Single ended queue
- 2. D) The right empty
- 3. C) False, True
- 4. B) Ancestor node
- 5. B) True, False
- 6. D) None of the above
- 7. D) All of the above
- 8. A) Directed tree
- 9. B) Binary tree
- 10. C) True, True
- 11. A. Linear arrays
- 12. B. Records
- 13. B. overflow
- 14. D. dequeue
- 15. D. all of the above
- 16. B. data structure
- 17. D. all of the above
- 18. B. linked allocation
- 19. A. for relatively permanent collections of data
- 20. C. Pointers store the next data element of a list.

1. Which one of the following is the process of inserting an element in the stack?

1. Insert
2. Push
3. Add
4. None of the above

Answer: Push

2. Which one of the following is not the application of the stack data structure?

1. Asynchronous data transfer
2. String reversal
3. Backtracking
4. Recursion

Answer: Asynchronous data transfer

3. Which of the following is the prefix form of $A+B*C$?

1. $+A*BC$
2. $ABC+*$
3. $+AB*C$
4. $A+(BC*)$

Answer: $+A*BC$

4. Which data structure is required to convert the infix to prefix notation?

1. Queue
2. stacks
3. Linked list
4. Binary tree

Answer: stacks

5. Which of the following highly uses the concept of an array?

1. Binary Search tree

2. Caching
3. Spatial locality
4. Scheduling of Processes

Answer: Spatial locality

6. Which of the following is the infix expression?

1. ABC+*
2. A+B*C
3. +A*BC
4. None of the above

Answer: A+B*C

7. Which data structure is mainly used for implementing the recursive algorithm?

1. Stack
2. Queue
3. Linked list
4. Binary tree

Answer: Stack

8. What is the outcome of the prefix expression +, -, *, 3, 2, /, 8, 4, 1?

1. 12
2. 5
3. 11
4. 4

Answer: 5

9. Which one of the following node is considered the top of the stack if the stack is implemented using the linked list?

1. Second Node
2. First Node
3. Last Node
4. None of the above

Answer: First Node

10. A list of elements in which enqueue operation takes place from one end, and dequeue operation takes place from one end is_____

1. Queue
2. Stack
3. Binary Tree
4. Linked List

Answer: Queue

11. The necessary condition to be checked before deletion from the Queue is_____

1. Underflow
2. Front value
3. Overflow
4. Rear value

Answer: Underflow

12. Which one of the following is not the application of the Queue data structure?

1. Data is transferred asynchronously
2. Resource shared between various systems
3. Balancing of symbols
4. Load balancing

Answer: Balancing of symbols

13. What is the maximum number of children that a node can have in a binary tree?

1. 4
2. 1
3. 3
4. 2

Answer: 2

14. Which one of the following techniques is not used in the Binary tree?

1. Preorder traversal
2. Randomized traversal
3. Inorder traversal
4. Postorder traversal

Answer: Randomized traversal

15. How many Queues are required to implement a Stack?

1. 3
2. 2
3. 1
4. 4

Answer: 2

16. A linear data structure in which insertion and deletion operations can be performed from both the ends is_____

1. Circular Queue
2. Deque
3. Queue
4. Priority Queue

Answer: Deque

17. How can we describe an array in the best possible way?

1. Arrays are immutable
2. Container that stores the elements of similar types
3. The Array is not a data structure
4. The Array shows a hierarchical structure

Answer: Container that stores the elements of similar types

18. What is another name for the circular queue among the following options?

1. Rectangle buffer
2. Square buffer
3. Ring Buffer
4. None of the above

Answer: Ring Buffer

19. Which of the following that determines the need for the Circular Queue?

1. Follow the LIFO Principles
2. Access the Queue using priority
3. Avoid wastage of memory
4. Follows the FIFO principle

Answer: Avoid wastage of memory

20. Which of the following principle does Queue use?

1. FIFO Principles
2. LIFO Principles
3. Ordered Array
4. Linear Tree

Answer: FIFO Principles

21. Which data structure is the best for implementing a priority queue?

1. AStack
2. Linked list
3. Array
4. binary Heap

Answer: binary Heap

22. Which of the following data structures finds its use in recursion?

1. Stack
2. Linked list
3. Array
4. Queue

Answer: Stack

23. Which of the following satisfies the property of the Red Black tree?

- 1. Black, if the new node is a root node
- 2. Red, if the new node is not a root node
- 3. Black, if the new node is not a root node
- 4. Both A and B

Answer: Both A and B

24. In the Deque implementation using singly linked list, what would be the time complexity of deleting an element from the rear end?

- 1. $O(n^2)$
- 2. $O(1)$
- 3. $O(n \log n)$
- 4. $O(n)$

Answer: $O(n)$

25. Which one of the following is the overflow condition if linear queue is implemented using an array with a size MAX_SIZE?

- 1. $\text{rear} = \text{MAX_SIZE} - 1$
- 2. $\text{rear} = \text{MAX_SIZE}$
- 3. $\text{rear} = \text{front} + 1$
- 4. $\text{rear} = \text{front}$

Answer: $\text{rear} = \text{MAX_SIZE} - 1$

26. Which of the following is a Divide and Conquer algorithm?

- 1. Merge Sort
- 2. Heap Sort
- 3. Selection Sort
- 4. Bubble Sort

Answer: Merge Sort

27. Which of the following principle is used if two elements in the priority queue have the same priority?

- 1. Linear Tree
- 2. FIFO
- 3. LIFO
- 4. None of the above

Answer: FIFO

28. The time complexity of enqueue operation in Queue is _____

- 1. $O(n)$
- 2. $O(1)$
- 3. $O(n \log n)$
- 4. $O(\log n)$

Answer: O(1)

29. Which one of the following is not the type of the Queue?

- 1. Linear Queue
- 2. Single ended Queue
- 3. Circular Queue
- 4. Double ended Queue

Answer: Single ended Queue

30. If the elements '1', '2', '3' and '4' are added in a stack, so what would be the order for the removal?

- 1. 4321
- 2. 1234
- 3. 2314
- 4. None of the above

Answer: 4321

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Multiple Choice Questions for Data Structures

1. Minimum number of fields in each node of a doubly linked list is

- (A) 2
- (B) 3
- (C) 4
- (D) None of the above

Ans: B

3

2. A graph in which all vertices have equal degree is known as ____

- (A) Complete graph
- (B) Regular graph
- (C) Multi graph
- (D) Simple graph

Ans: A

Complete graph

3. A vertex of in-degree zero in a directed graph is called a/an

- (A) Root vertex
- (B) Isolated vertex
- (C) Sink
- (D) Articulation point

Ans: C

Sink

4. A graph is a tree if and only if graph is

- (A) Directed graph
- (B) Contains no cycles
- (C) Planar
- (D) Completely connected

Ans: B

Contains no cycles

5. The elements of a linked list are stored

- (A) In a structure
- (B) In an array
- (C) Anywhere the computer has space for them
- (D) In contiguous memory locations

Ans: C

Anywhere the computer has space for them

6. A parentheses checker program would be best implemented using

- (A) List
- (B) Queue
- (C) Stack
- (D) Any of the above

Ans: C

Stack

7. To perform level-order traversal on a binary tree, which of the following data structure will be required?

- (A) Hash table
- (B) Queue
- (C) Binary search tree
- (D) Stack

Ans: B

Queue

8. Which of the following data structure is required to convert arithmetic expression in infix to its equivalent postfix notation?

- (A) Queue
- (B) Linked list
- (C) Binary search tree
- (D) None of above

Ans: D

None of above

9. A binary tree in which all its levels except the last, have maximum numbers of nodes, and all the nodes in the last level have only one child it will be its left child. Name the tree.

- (A) Threaded tree
- (B) Complete binary tree
- (C) M-way search tree
- (D) Full binary tree

Ans: B

Complete binary tree

10. Which of following data structure is more appropriate for implementing quick sort iteratively?

- (A) Deque
- (B) Queue
- (C) Stack
- (D) Priority queue

Ans: C

Stack

11. The number of edges in a complete graph of n vertices is

- (A) $n(n+1)/2$
- (B) $n(n-1)/2$
- (C) $n^2/2$
- (D) n

Ans: B

$n(n-1)/2$

12. If two trees have same structure and but different node content, then they are called ____

- (A) Synonyms trees
- (B) Joint trees
- (C) Equivalent trees
- (D) Similar trees

Ans: D

Similar trees

13. If two trees have same structure and node content, then they are called ____

- (A) Synonyms trees
- (B) Joint trees
- (C) Equivalent trees
- (D) Similar trees

Ans: C

Equivalent trees

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

- A. Discovering
- B. Finding
- C. Searching
- D. Mining

Ans. C

searching

15. The time complexity of quicksort is

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

Ans. D

$O(n \log n)$

16. Quick sort is also known as

- A. merge sort
- B. tree sort
- C. shell sort
- D. partition and exchange sort

Ans. D

partition and exchange sort

17. sorting is good to use when alphabetizing a large list of names.

A. Merge

B. Heap

C. Radix

D. Bubble

Ans. C

Radix

18. The total number of comparisons in a bubble sort is

A. $O(n \log n)$

B. $O(2n)$

C. $O(n^2)$

D. $O(n)$

Ans. A

$O(n \log n)$

19. form of access is used to add and remove nodes from a queue.

A. LIFO, Last In First Out

B. FIFO, First In First Out

C. Both a and b

D. None of these

Ans. B

FIFO, First In First Out

20. New nodes are added to the of the queue.

A. Front

B. Back

C. Middle

D. Both A and B

Ans. B

Back

21. The term push and pop is related to

- A. Array
- B. Lists
- C. Stacks
- D. Trees

Ans. C

Stacks

22. Which of the following is an application of stack?

- A. finding factorial
- B. tower of Hanoi
- C. infix to postfix
- D. all of the above

Ans. D

all of the above

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

- A. sorting
- B. merging
- C. inserting
- D. traversal

Ans. D

traversal

24. The situation when in a linked list $START = NULL$ is

- A. Underflow
- B. Overflow
- C. Houseful
- D. Saturated

Ans. A

Underflow

25. Which of the following are two-way lists?

- A. Grounded header list
- B. Circular header list
- C. Linked list with header and trailer nodes
- D. List traversed in two directions

Ans. D

List traversed in two directions

26. Which is the pointer associated with the availability list?

- A. FIRST
- B. AVAIL
- C. TOP
- D. REAR

Ans. B

AVAIL

27. Which of the following data structure can't store the non-homogeneous data elements?

- A) Arrays
- B) Records
- C) Pointers
- D) Stacks

Ans. A

Arrays

28. Which of the following is non-linear data structure?

- A) Stacks
- B) List
- C) Strings
- D) Trees

Ans. D

Trees

29. To represent hierarchical relationship between elements, which data structure is suitable?

- A) Dequeue
- B) Priority
- C) Tree
- D) Graph

Ans. C

Tree

30. Identify the data structure which allows deletions at both ends of the list but insertion at only one end.

- A) Input restricted dequeue
- B) Output restricted dequeue
- C) Priority queues
- D) Stack

Ans. A

Input restricted dequeue

For more MCQs, Visit <https://www.siteforinfotech.com/p/data-structure-mcq-sets.html>

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