## **DSA - LAB MCQs Exam**

English 🗸

## Result..

Total Score -	35
Correct Answer -	35
Wrong Answer -	35
Total Attempt-	70
Total Not Attempt -	0

### Your performance

← Dashboard (https://www.parikshado.com/oldwebsite/dashboard)

### 1 of 70

which of the given options provides the increasing order of asymptotic complexity of functions f1,f2,f3and f4?

f1 (n)-2<sup>n</sup>

 $f2(n) = n^{3}(3/2)$ 

f3(n)=nLogn

f4(n) n<sup>^</sup> (Logn)

- 1 O f3,f2,f4,f1
- (**3**) ( f2,f3,f1,f4

f3,f2,f4,f1

#### 2 of 70

From following which is not the operation of data structure?

- 1 Operations that manipulate data in some way
- **2** Operations that perform a computation
- **3** Operations that check of syntax errors
- 4
- Operations that monitor an object for the occurance of a controlling event

### **Solution -**

Operations that manipulate data in some way

### 3 of 70

Complete the following code if the function implements bubble sort, to sort elements in ascending order.

- int temp= arr[i];
  - arr[j+1]=arr[j];
- **1** arr[j]=temp;

,,	
int temp=arr[j-1];  arr[j-1]=arr[j]:  arr[j]=temp;	
<pre>int temp=arr[i-1]:     arr[i-1]=arr[j];     arr[i]=temp;</pre>	
<pre>int temp =arr[i-1]; arr[i-1]=arr[j]; arr[j]=temp;</pre>	
<b>Solution -</b> int temp=arr[j-1];	
arr[j-1]=arr[j]: arr[j]=temp;	

If you want to store the name and marks of N students, which of the following is the correct choice?

- 1 O An array of structures that contains names and marks as a field
- 2 Astructure containing arrays of Names and arrays of Marks
- **3** An array of names and an Array of marks
- 4 All of the above

### **Solution -**

An array of structures that contains names and marks as a field

### 5 of 70

The time complexity of merge sort algorithm is

1 O O(n)

28/23, 5:11 PM	Walrus Solutions - Leading online tes
2 O(log n)	
3 O(n^2)	
<b>4</b> ○ O(n log n) ✓	
Solution -	
O(n log n)	
6 of 70	
What are the time complexities of fin beginning and the 8th element from the the number of nodes in a linked list	he end in a singly linked list? Let n
1 O(1) and O(n)	
2 O(1) and O(1)	

- O(n) and O(1)
- O(n) and O(n)

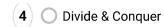
O(1) and O(n)

### 7 of 70

Which of the following algorithm design techniques is used in finding all pairs of shortest distances in a graph?

1	O Dynamic programming	<b>~</b>
---	-----------------------	----------

- Back Tracking
- Greedy



Dynamic programming

### 8 of 70

If already sorted array is passed to a sorting algorithm, which one will be the slowest?



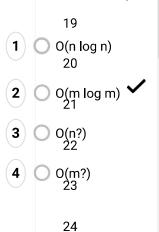
## Solution -Insertic 00:00:00

# Question palette

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Let 'm' and 'n' be the number of edges and vertices in a graph G, respectively.

Which of the following is the time complexity of Kruskal's algorithm to find the minimum spanning tree of G?



25
Solution O(m log m)

#### 10 of 70

Which one of the following is an application of queue data structure

- 1 When a resource is shared among multiple consumers.
- 2 When a data is tranferred asynchronously
- 3 O Load Balancing
- 4 All the above

### **Solution -**

All the above

### 11 of 70

Which node porter should be updated a new node is to be inserted in the middle of a Credes of a doubly linked list?

- Next Pointer of A. Previous Pointer of B, Next Painter of C and previous
- pointer of C
- Next Pointer of A. Previous Pointer of B, Next Pointer of B and previous
- pointer of C
- (3)
- Next Pointer of A, Previous pointer of Anext pointer of B and previous
  - pointer of C
- 4 None of the above

Next Pointer of A. Previous Pointer of B, Next Pointer of B and previous pointer of C



onsider the stack shown below:

12 11 34 56 5 45 4 45

Top

After performing the following operations in sequence, which value will be at the top of the stack?

Pop,pop,pop,push 29, push 30,pop,pop,pop

- 1 0 29
- 2 0 30
- 3 0 5
- 4 0 56

### **Solution -**

56

#### 13 of 70

A complete n-ary tree is a tree in which each node has n children or no children.

Let | be the number of internal nodes and L be the number of leaves in a complete n-ary tree. If L = 41, and | = 10, what is the value of n?

- 1 0 6
- 2 0 3
- 3 0 4



5

### 14 of 70

The height of a binary tree is the maximum number of edges in any root-to-leaf path. The maximum number of nodes in a binary tree of height is\_\_\_\_

- **1** 2%h -1
- **2** 2%h-1)-1
- 3 2%h+1)-1
- **4** 2\*(h+1)

### **Solution -**

2%h+1) -1

### 15 of 70

We use a dynamic programming approach when:

- 3 O The given problem can be reduced to the 3-SAT problem
- 4 O It's faster than Greedy

The solution has an optimal substructure

### 16 of 70

The value returned by Hash Function is called as:

- 1 O Digest

- 4 All of these

### **Solution -**

All of these

### 17 of 70

```
Which of the following is recursive preorder traversal function, if class node is defined as follows?
class Node {
  int data;
  Node left, right,
  public Node(int key) {
    data=key;
  left=right = null;
  }
}
```

if(node= = null)
return;
System.out.print(node.data + \* >\*);
Preorder(node. Left):
preorder(node.right):

**(1)** 

```
void preorder(Node node){
        if(node!= null
        return;
        System.out.print(node.data + * >*);
        Preorder(node. Left);
        preorder(node.right);
2
    void preorder(Node node){
        if(node!= null
 3
        return;
       none
Solution -
void preorder(Node node) {
if(node= = null)
return;
System.out.print(node.data + * >*);
Preorder(node. Left):
preorder(node.right):
}
```

Consider the following undirected graph with edge weights as shown:
at a4
09 a2 ao
a4 09
at at 0.4
as a4
The number of minimum-weight spanning trees of the graph is
1 O In adjacency list representation, space is saved for sparse graphs.
2 O In adjacency list representation, space is saved for sparse graphs.
<b>(3</b> )

Adding a vertex in adjacency list representation is easier than adjacency

matrix representation.

All of the above

All of the above

### 19 of 70

What is the time complexity of the following code: int a = 0,1=N; while (i > 0) {  $a +=i; \\ i \neq 2;$  }

- 1 O O(N)
- **2** O(Sqrt(N))
- **3** O(N/2)
- **4** O(log N) ✓

## **Solution -**

O(log N)

### 20 of 70

The recurrence relation capturing the optimal time of the Tower of Hanoi problem with n discs is

- 1 O T(n) = 2T(n-2)+2
- 2 T(n) = 2T(n-1)+n
- **3** Tin) = 2T(n/2)+1
- **4** O T(n)=2T(n-1)+1

T(n) = 2T(n-2)+2

#### 21 of 70

Which of the following is FALSE about B/B+ tree

- 1 O B/B+ trees grow upward while Binary Search Trees grow downward
- (2)
- Time complexity of search operation in B/B+ tree is better than Red Black
- Trees in general.
- (3)
  - Number of child pointers in a B/B+ tree node is always equals to number
- of keys in it plus one.
- A B/B+ tree is defined by a term minimum degree. And minimum degree depends on hard disk block size, key and address sizes.

### **Solution -**

Time complexity of search operation in B/B+ tree is better than Red Black Trees in general.

### 22 of 70

An ADT is defined to be a mathematical model of a user-defined type along with the collection\_\_\_\_\_\_of all operations on that model.

- 1 Cardinality
- 2 Assignment
- 3 O Primitive
- 4 OStructure

Primitive

### 23 of 70

Which of the following algorithm can be used to efficiently sort a linked list?

- 2 Quick Sort
- **3** O Heap Sort
- 4 Selection Sort

## **Solution -**

Merge Sort

### 24 of 70

What does the following return? Public int getval (Bnode T) { //T=root node int value =0; if(T) { //LC= Left child and RC right child If((T.L.C)== NULL) && (T.RC)== NULL)) value -1; else value= value+ getval(T.LC)+ getval(.TRC): } return value; }

- 1 Number of internal nodes in the tree
- **2** height of the tree

3 Number of nodes without right sibling in the tree
4 Number of leaf nodes in the tree
Solution -
Number of nodes without right sibling in the tree
25 of 70
Which of the following data structure is BEST suited to implement LRU Cache?
1 Array
2 O Binary Tree
3 O Doubly Linked List ✓
4 O Graph
Solution -
Doubly Linked List
•
26 of 70
The integrity of transmitted data can be verified by using:
1  Message Authentication Code (MAC)
2  Timestamp comparison
3 O Data length comparison
4 O None of these

Message Authentication Code (MAC)

#### 27 of 70

In Hash Table, which collision handling technique results in Secondary Clustering?

- 1 Mid-Square
- 2 Quadratic Probing
- 3 Linear Probing
- 4 O Folding

### **Solution -**

**Quadratic Probing** 

### 28 of 70

Which of the following is the advantage of the array data structure?

- 4 Elements of an array cannot be sorted

### **Solution -**

Easier to access the elements in an array

<b>29 of 70</b> Which one of the following is an application of Stack Data Structure?
1
2    The stock span problem
3 Arithmetic expression evaluation
4 O All of the above
Solution -
All of the above
<b>30 of 70</b> A tree node with no children is called a:
1 O Leaf node ✓
2 Root node
3 O Parent node
4 O Ancestor node
Solution -
Leaf node
31 of 70  You are very hungry and you decide to bake a batch by following your

You are very hungry and you decide to bake a batch by following your grandmother's chocolate chip cookie recipe. Which of the following computational thinking skills required to complete the abovetask?

1 Abstraction

2 Algorithm Design
3 Pattern Recognition
4 O Decomposition
Solution -
Algorithm Design
32 of 70
Depth First Search graph traversal method makes use of data structure.
1 O Tree
2 O Stack
3 Queue
4 O Linked list
Solution -
Stack
33 of 70
Create a Binary search tree for the given set of strings: MAR, MAY, NOV,AUG,APR, JAN, DEC,JULY,FEB,JUNE,OCT,SEPT What are the leaf nodes generated in the tree?
1 O APR, FEB DEC, JULY, SEPT
2 O FEB JUNE, SEPT
3 O can't create the tree

4	0	None of the above

APR, FEB DEC, JULY, SEPT

### 34 of 70

In Computational thinking terms, breaking down a complex problem into smaller, more specific sub-problems is called as\_\_\_\_\_.

- 1 Problem Identification
- 2 O Decomposition
- 3 Pattern Recognition
- 4 Algorithmic Thinking

### **Solution -**

Decomposition

#### 35 of 70

Which is the safest method to choose a pivot element?

- 1 Choosing a random element as a pivot
- 2 Choosing the first element as a pivot
- 3 O Choosing the last element as a pivot
- 4 Median-of-three partitioning method

### **Solution -**

Median-of-three partitioning method

<b>36 of 70</b> Which of the following algorithms solves the all-pair shortest path algorithm?
1 O Prim"s algorithm
2 O Dijkstra's algorithm
3 O Bellman-Ford algorithm
4 O Floyd-Warshall's algorithm
Solution -
Floyd-Warshall's algorithm

In which of the following tree do the height of the left subtree and the height of the right subtree differ at most by one?

- 1 O AVL Tree
- 2 Expression Tree
- 4 O Binary Search Tree

### **Solution -**

**AVL Tree** 

### 38 of 70

Which one of the following is the tightest upper bound that represents the time complexity of inserting an object into a binary search tree of n nodes?

1 0 0(1)		
<b>2</b> O(log n)		
3 O(n) 🗸		
4 O(nlogn)		
Solution -		
O(n)		

What is the maximum height of any AVL tree with 7 nodes? Assume that the height of a tree with single node is 0.

- (1) O 2 ✓
- **2 O** 3
- 3 0 4
- 4 0 5

## **Solution -**

2

### 40 of 70

A digraph is said to be COMPLETE, if it has N vertices and ......edges.

- (1) O N\*N
- 2 O N-1
- 3 N\*(N-1)

**4** N\*(N-1)/2

### **Solution -**

N\*(N-1)

### 41 of 70

How many numbers of comparisons will be done in worst case using Binary Search the

- 1 0 10
- 2 0 2
- 3 0 5
- (4) O 4 **~**

### **Solution -**

4

#### 42 of 70

Let G=(V,G) be a weighted undirected graph and let T be a Minimum Spanning Tree (MST) of G maintained using adjacency lists. Suppose a new weighed edge  $(u,v) \in V*V$  is added to G. The worst-case time complexity of determining if T is still an MST of the resultant graph is

- 2 theta(E!.IVI)
- 3 theta(E| log IVI)
- 4 theta(IVI)

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theta(IVI)

### 43 of 70

Which of the following data structure is BEST suited to implement Priority Queue?

- 1 O Doubly Linked List
- 2 O Heap
- **3** Queue using Linked List
- 4 Array

## **Solution -**

Heap

### 44 of 70

Which of the following is NOT an example of balanced Binary Search Tree?

- 1 O Threaded Binary Tree
- 2 AVL Tree
- 3 Red-black Tree
- 4 Splay Tree

## **Solution -**

**Threaded Binary Tree** 

Consider the following type declaration for a doubly linked list node class DListNode{ int data; DListNode prev DListNode next; }

Which of the following statements (in correct order) will corectly insert a newNode node. before the node referenced by current?Assume that current is neither first nor last node in the linked list.

- newNode.next current; current.prev newNode; newNode prev current prev;
- 1 current. prev.next = newNode;
  - current.prev= = newNode; newNode.next= current; newNode. prev=current .prev;
- 2 current. prev.next = newNode;
  - newNode. prev =current.prev; newNode.next =current; current. Prev. next= newNode;
- current.next.prev= newNode; 3
  - newNode prev = current. Prev; newNode.next= current; current. Prev.next= newNode; current.prev=
- newNode;

### **Solution -**

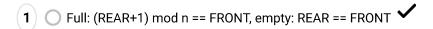
newNode. prev =current.prev; newNode.next =current; current. Prev. next= newNode; current.next.prev= newNode;

### 46 of 70

If the list is a circular linked list, with first points to the first node and temp points to the last node. Which of the following code snippet will delete a node, which is after temp? class Node { int data;

Node next;
}
1 mynode=first mynode.next=temp.next; mynode.next=first;
2 mynode=first temp.next=mynode; mynode.next-first
3 temp.next-first. next; mynode=first; first=first.next; mynode. next=null
4 O None of the above ✓
Solution -
None of the above
Hone of the above

Suppose a circular queue of capacity (n-1) elements is implemented with an array of n elements. Assume that the insertion and deletion operation are carried out using REAR and FRONT as array index variables, respectively. Initially, REAR = FRONT = 0. The conditions to detect queue full and queue empty are



- **3** O Full: REAR == FRONT, empty: (REAR+1) mod n == FRONT
- 4 O Full: (FRONT+1) mod n == REAR, empty: REAR == FRONT

### **Solution -**

Full: (REAR+1) mod n == FRONT, empty: REAR == FRONT

### 48 of 70

How many Stacks are required to implement Queue data structure?

(1) () 5					
<b>2</b> O 1					
3 O 2 <b>~</b>					
<b>4</b> O 3					
Solution -					
2					
49 of 70					
Which of the following algorithm can be used to detect negative cycle in					
a Graph?					
1 O Prim					
2 O Kruskal					
3 O Dijkstra					
4 O Bellman Ford					
Solution -					
Bellman Ford					
50 of 70					
What is the worst case possible height of AVL tree?					
1 2Logn Assume base of log is 2					
2 1.44Log n Assuming base of log is 2					
(3) Opends upon implementation					

4 O theta(n)

## **Solution -**

1.44Log n Assuming base of log is 2

### 51 of 70

Which of the following types of Linked List support forward and backward traversal?

- 1 Singly Linked List
- 2 O Doubly Linked List
- 3 Oircular Singly Linked List
- 4 All of these

## **Solution -**

**Doubly Linked List** 

### 52 of 70

Let A[1...n] be an array of n distinct numbers. If Afj], then the pair (i, J) is called an inversion of A. What is the

expected number of inversions in any permutation on n elements?

- **1** n(n-1)/2

- 4 2nf[logn]

n(n-1)/4

#### 53 of 70

Suppose the numbers 7, 5, 1, 8, 3, 6, 0, 9, 4, 2 are inserted in that order into an initially empty binary search tree. The binary search tree uses the usual ordering on natural numbers. What is the in-order traversal sequence of the resultant tree?

- **2** 0 2 4 3 1 6 5 9 8 7
- 3 0 0123456789
- 4 0 9864230157

## **Solution -**

0123456789

### 54 of 70

Using \_\_\_\_\_ in java, one can sort the arrays.

- 1 System.sort()
- 2 Collection. sort()
- 3 Arrays.sort()
- 4 Array.sort()

## **Solution -**

Array.sort()

A hash function h defined h(key)=key mod 7, with linear probing, is used to insert the keys 44, 45, 79, 55, 91, 18, and 63 into a table indexed from 0 to 6. What will be the location of key 18?

- 1 0 3
- 2 0 4
- 3 0 5
- 4 0 6

### **Solution -**

5

### 56 of 70

Which algorithm strategy builds up a solution by choosing the option that looks the best at every step?

- 1 O Greedy method
- 2 O Branch and bound
- 3 O Dynamic programming
- 4 O Divide and conquer return count

## **Solution -**

Greedy method

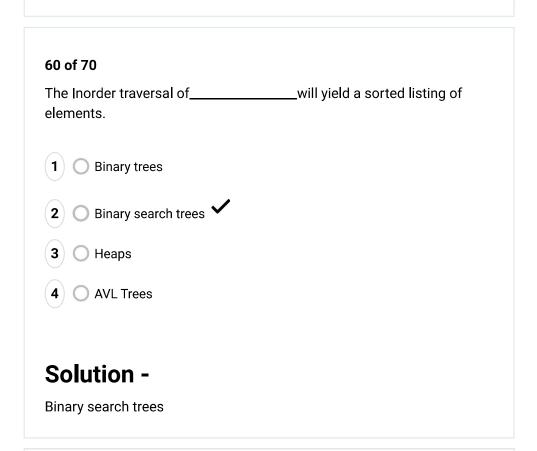
### 57 of 70

If a node has K children in B tree, then the node contains exactly keys.

1 O K	1 O K? 2 O K-1 ✓ 3 O K+1				
2 O K-					
3 O K-					
4 O VI	K				
Soluti	ion -				
K-1					
58 of 70					
What is th	ne best way to go for the game-playing problem?				
1 0 0	ptimal Search				
2 O Ra	andom Search				
(3) () H	euristic Search 🗸				
4 O St	tratified Search				
Soluti	ion -				
Heuristic	Search				
59 of 70					
	n P reads in 500 integers in the range [0100] representing the 500 students. It then prints the frequency of each score above				
	would be the best way for P to store the frequencies?				
	a current of EO promehous 🗸				
	n array of 50 numbers 🗸				
<b>2</b> O ar	n array of 100 numbers				
3 O ar	n array of 500 numbers				

4 a dynamically allocated of 550 numbers						
<b>.</b>						

an array of 50 numbers



### 61 of 70

What is the worst case time complexity of Search() operation in an unbalanced Binary Search Tree having 'n' nodes?

- **1** O 0 (1)
- **2** O(logn)
- 3 O(n) ✓
- **4** O(n log n)

### **Solution -**

O(n)

62	٥f	70
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Which of the following uses queue as data structure to store data?

- 2 O To check whether given string is palindrome
- 3 Display string in reverse order
- 4 O DFS traversal of the tree

## **Solution -**

Waiting queue for railway reservation system

### 63 of 70

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

- 1 O Stack
- 2 Linked List
- 3 O Binary Tree
- 4 Queue

## **Solution -**

Stack

### 64 of 70

An algorithm that calls itself directly or indirectly is known as\_\_\_\_\_

1 O Sub algorithm					
2 Recursive algorithms					
3 O Polish notation					
4 O Traversal algorithm					
Solution -					
Recursive algorithms					
<b>65 of 70</b> Which of the following options is not true about the Binary Search Tree?					
which of the following options is not true about the binary Search free:					
1 O The value of the left chad should be less than the root node.					
2					
3 O The left and the right sub trees should also be a binary search tree					
4 None of the above					
Solution -					
The value of the left chad should be less than the root node.					
66 of 70					
The time required to search an element in a linked list of length is					
1 O(log n)					
2 O(n) •					
<b>3</b> O(1)					

<b>(4</b> )	0	O(n?)

O(n)

### 67 of 70

is a collision-resolution scheme that searches the hash table for an unoccupied location beginning with the original location that the hash function specifies and continuing at increments of 1^2, 2^2, 3^2, and so on.

- 1 Linear probing
- **2** O Double hashing
- 3 Quadratic probing
- 4 O Separate chaining

## **Solution -**

Quadratic probing

### 68 of 70

singly linked list if headpoints to the first node, which of the following code will print data in last node?

- Temp=head;
  while(temp!=null) {
  temp=temp.next;
  }
- 1 System.out.println(temp.data)

```
temp=head;
       while(temp.next!=null){
       temp=temp.next;
       {
       System.out.println(temp.data);
2
    Temp=head;
       while(temp.next==null) {
       temp=temp.next;
       }
 3
       System. Out. println(temp.data);
      Temp=head;
       while(temp==null){
Solution -
temp=head;
while(temp.next!=null){
temp=temp.next;
System.out.println(temp.data);
```

```
What is time complexity of the following code? int sum=0; for (int i = 0; i < n; i++) { sum=sum+10; for (int j = 0; j < n; j++) { sum=sum + j; break; }
```

- 1 O(n²)
- 2 O(n)
- 3 0 (1)
- **4** O(log n)



O(n)

### 70 of 70

What is the best-case time complexity of Bubble sort to sort an array of 'n' elements?

- **1** O(n^2)
- **2** O(n log n)
- **3** O(1)
- **4** O(n) ✓

## **Solution -**

O(n)