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A Good Education is a Foundation For a Better Future

CORRECT ANSWER SOLVED BY HADI
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(Final Term Past Paper)

MADE AND SOLVED BY TEAM HADI

WARNING: Team HADI is not responsible for any mistake or wrong answer. All students reading and using this document may check and confirm the answers at their own.



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Best of luck!



Question No : 1 of 52

Marks: 1 (Budgeted Time 1 Min)

The data of the problem is of 2GB and the hard disk is of 1GB capacity, to solve this problem we should

Answer (Please select your correct option)

- Use better data structures
- Increase the hard disk space **concept**
- Use the better algorithm
- Use as much data as we can store on the hard disk

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Question No : 2 of 52

Marks: 1 (Budgeted Time 1 Min)

Four statements about trees are below. Three of them are correct. Which one is INCORRECT?

Answer (Please select your correct option)

Trees are recursively defined multi-dimensional data structures

The order of a tree indicates a maximum number of children allowed at each node of the tree

A search tree is a special type of tree where all values (i.e. keys) are ordered

p 355 unordered

If Tree1's size is greater than Tree2's size, then the height of Tree1 must also be greater than Tree2's height

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Question No : 3 of 52

Marks: 1 (Budgeted Time 1 Min)

Which of the following is NOT an implementation of Table ADT?

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Answer (Please select your correct option)

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Sorted Sequential Array

Linked List

Skip list

Stack

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Question No : 4 of 52

Marks: 1 (Budgeted Time 1 Min)

Consider the following array

23 15 5 12 40 10 7

After the first pass of a particular algorithm, the array looks like

15 5 12 23 10 7 40

Name the algorithm used

Answer (Please select your correct option)

Heap sort

Selection sort

Insertion sort

Bubble sort

according to rule
page 485

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Question No : 5 of 52

Marks: 1 (Budgeted Time 1 Min)

Which one of the following algorithms is least efficient,

ref →

CS-301 Data Structure

Tariq Hanif

Answer (Please select your correct option)

Quick Sort

Insertion Sort

Merge Sort

Bubble Sort

7. Suppose that a selection sort of 100 items has completed. How many items are now guaranteed to be in their final spot?

21

41

42

43

8. Which one of the following algorithms is least efficient,

Quick Sort

Insertion Sort

Merge Sort

Bubble Sort

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Question No : 6 of 52

Marks: 1 (Budgeted Time 1 Min)

Suppose a pointer has been declared in main but has not assigned any variable address then

Answer (Please select your correct option)

- That pointer points to First byte in main function
- That pointer contains a NULL value
- That pointer points to last byte in the main function
- That pointer points to any memory address

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If we insert a new node in an AVL tree which is perfectly balanced tree, then we will need _____ to keep it AVL.

Answer (Please select your correct option)

One rotation

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Two rotations

Rotations equal to number of levels

No rotation at all

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Question No : 8 of 52

Marks: 1 (Budgeted Time 1 Min)

The worst case of deletion in AVL tree requires _____.

Answer (Please select your correct option)

Only one rotation

Rotation at each non-leaf node

Rotation at each leaf node

Rotations equal to $\log_2 N$

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Question No : 9 of 52

Marks: 1 (Budgeted Time 1 Min)

To create a _____, we link the last node with the first node in the list.

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Answer (Please select your correct option)

Doubly linked list

Circularly linked list

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Linked list

Triply linked list

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Question No : 10 of 52

Marks: 1 (Budgeted Time 1 Min)

I have implemented the queue with a circular array. If that circular array has capacity of N elements, and **last** is an index into that array, what is the formula for the index after last?

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Answer (Please select your correct option)

$(last \% 1) + N$

$last \% (1 + N)$

$(last + 1) \% N$

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$last + (1 \% N)$

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Marks: 1 (Budgeted Time 1 Min)

By using _____, we avoid the recursive method of traversing a Tree.

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Answer (Please select your correct option)

Binary tree only

Threaded binary tree

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Heap data structure

Huffman encoding

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Question No : 12 of 52

Marks: 1 (Budgeted Time 1 Min)

A Binary tree can be traversed using _____.

Answer (Please select your correct option)

recursion

iteration

both recursion and iteration

traversal can only be done on BST

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Question No : 13 of 52

Marks: 1 (Budgeted Time 1 Min)

In complete Binary tree, the bottom level is filled from _____.

Answer (Please select your correct option)

Left to right

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Right to left

Not filled at all

Up to down

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Which of the following statement is NOT true for Huffman code?

Answer (Please select your correct option)

VuAnswers.com

It is a method for the compression of standard text documents.

It uses Binary tree to develop codes of varying lengths for the letters used in the original message.

It is no more used in any compressed file format.

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correct answer solved by Hadi

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Question No : 15 of 52

Marks: 1 (Budgeted Time 1 Min)

If a complete Binary tree has height h , then its number of nodes will be :

answer from moazz

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Answer (Please select your correct option)

Log (h)

$2^{h+1} - 1$

p 324

Log (h) - 1

$2^h - 1$

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Question No : 16 of 52

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While building Huffman encoding tree, the new node that is the result of joining two nodes has the frequency.

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Answer (Please select your correct option)

Equal to the small frequency

Equal to the greater frequency

Equal to sum of the two frequencies

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Equal to difference of the two frequencies

correct answer solved by Hadi

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Question No : 17 of 52

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Which one of the following is NOT true regarding the skip list?

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Answer (Please select your correct option)

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Each list S_i contains the special keys $+\infty$ and $-\infty$.

List S_0 contains the keys of S in non-decreasing order.

Each list is a subsequence of the previous one.

List S_n contains only the n special keys.

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Question No : 18 of 52

Marks: 1 (Budgeted Time 1 Min)

Which one of the following is NOT the property of equivalence relation:

Answer (Please select your correct option)

Reflexive

Symmetric

Transitive

Associative

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Question No : 19 of 52

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Which of the following is true for disjoint sets A and B ?

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Answer (Please select your correct option)

Intersection of A & B is equal to B

Union of A & B is empty

Intersection of A & B is empty

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Intersection of A & B is equal to A

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Question No : 20 of 52

Marks: 1 (Budgeted Time 1 Min)

When unions are done by weight (size), the depth of any element is never greater than

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Answer (Please select your correct option)

$\log_2 n$

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$n \log_2 n$

$n \log_2 n + 1$

$\log_2 n - 1$

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Question No : 21 of 52

Marks: 1 (Budgeted Time 1 Min)

Suppose you implement a Min heap (with the smallest element on top) in an array. Consider the different arrays below; determine the one that *cannot* possibly be a heap:

Answer (Please select your correct option)

16, 18, 20, 22, 24, 28, 30

16, 20, 18, 24, 22, 30, 28

16, 24, 18, 28, 30, 20, 22

16, 24, 20, 30, 28, 18, 22

ref moazz

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Suppose `currentNode` refers to a node in a linked list (using the `Node` class with member variables called `data` and `nextNode`). Which boolean expression will be true when `currentNode` refers to the tail node of the list?

ref 

CS-301 Data Structure

Sahiwal

Tariq Hanif

Answer (Please select your correct option)

`(currentNode == null)`

`(currentNode->nextNode == null)`

`(nextNode.data == null)`

`(currentNode.data == 0.0)`

38. Suppose `currentNode` refers to a node in a linked list (using the `Node` class with member variables called `data` and `nextNode`). Which boolean expression will be true when `currentNode` refers to the tail node of the list?

`(currentNode == null)`

`(currentNode->nextNode == null)`

`(nextNode.data == null)`

`(currentNode.data == 0.0)`

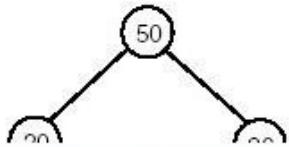
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Question No : 23 of 52

Marks: 1 (Budgeted Time 1 Min)

Below is a Binary Search Tree (BST). If we delete the value 50 from the root node, what would be the value in the root of the remaining tree?



Answer (Please select your correct option)

50

60

70

80

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Question No : 24 of 52

Marks: 1 (Budgeted Time 1 Min)

The subscript of an array is used for,

- I) Negating array size
- II) Retrieving array elements
- III) Changing array name
- IV) Multiplication of array size

Answer (Please select your correct option)

I and II Only

II Only

I and IV Only

IV Only

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Question No : 25 of 52

Marks: 1 (Budgeted Time 1 Min)

Searching an element in an AVL tree takes maximum _____ time (where n is number of nodes in AVL tree)

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Answer (Please select your correct option)

$\log_2(n+1)$

$\log_2(n+1) - 1$

$1.44 \log_2 n$

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$1.66 \log_2 n$

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Marks: 1 (Budgeted Time 1 Min)

A complete binary tree having "N" nodes consists of Levels.

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Answer (Please select your correct option)

$\log_2(N+1) - 1$

$\log_2(N-1) - 1$

$\log_2(N+1) + 1$

$\log_2(N-1) + 1$

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Question No : 27 of 52

Marks: 1 (Budgeted Time 1 Min)

Running time of $find(i)$ is proportional to the _____ of the tree containing node i .

Answer (Please select your correct option)

Weight

Height

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Root

Number of links

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Question No : 28 of 52

Marks: 1 (Budgeted Time 1 Min)

Which of the following is used to represent an image in the computer?

Answer (Please select your correct option)

Characters

Text

Numbers

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Audio

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Hash function is used to convert:

confusion

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Answer (Please select your correct option)

A hash number key to a key

A key to a hash value

Data into table

Character data into integer data

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Question No : 30 of 52

Marks: 1 (Budgeted Time 1 Min)

Hash function is:

Answer (Please select your correct option)

A Table

An Algorithm

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A Data Structure

A program

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When two or more than two keys produce a same index in hashing function, this situation is know as:

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Answer (Please select your correct option)

Same key generation

Same value generation

Same key and same value

Collision

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Question No : 32 of 52

Marks: 1 (Budgeted Time 1 Min)

Best case running time of selection sort algorithm is:

Answer (Please select your correct option)

(n)

(n²)

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(logn)

(nlogn)

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Best case running time of insertion sort algorithm is:

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Answer (Please select your correct option)

(n)

(n²)

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(logn)

(nlogn)

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Question No : 34 of 52

Marks: 1 (Budgeted Time 1 Min)

Which of the following can NOT be a max-heap ?

7 6 5 4 3 2 1

7 3 6 2 1 4 5

7 6 4 3 5 2 1

7 3 6 4 2 5 1

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Question No : 35 of 52

Marks: 1 (Budgeted Time 1 Min)

The maximum number of external nodes (leaves) for a binary tree of height H is _____

Answer (Please select your correct option)

2^H

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2^{H+1}

$2^H - 1$

$2^H + 2$

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Which of the following is the most significant part of compilers?

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Answer (Please select your correct option)

AVL tree

Expression tree

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Array

Binary tree

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Question No : 37 of 52

Marks: 1 (Budgeted Time 1 Min)

Which of the following is NOT a factor in *Union by Size*?

Answer (Please select your correct option)

- Maintains sizes (number of nodes) of all trees
- Makes smaller tree, the subtree of the larger one
- Makes the larger tree, the subtree of the smaller one
- Maintains sizes (number of nodes) while performing union operation

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A binary tree with 33 internal nodes has _____ links to internal nodes.

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Answer (Please select your correct option)

31

32

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33

66

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Which of the following statements is NOT true about threaded binary tree?

Answer (Please select your correct option)

Right thread of the right-most node points to the *dummy* node.

Left thread of the left-most node points to the *dummy* node.

The left pointer of the *dummy* node points to the root node of the tree.

Left thread of the right-most node points to the *dummy* node.

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Question No : 40 of 52

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Which of the following is NOT an example of equivalence relation?

Answer (Please select your correct option)

Electrical connectivity

Set of people

\leq relation

ref moazz files

Set of pixels

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Question No : 41 of 52

Marks: 2 (Budgeted Time 4 Min)

How we can delete an element from Skip List

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Answer (Please [click here](#) to Add Answer)

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Question No : 43 of 52

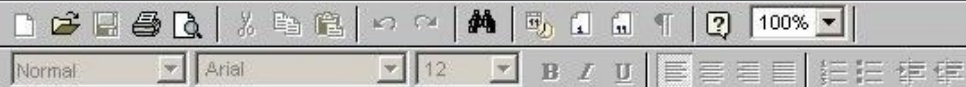
Marks: 2 (Budgeted Time 4 Min)

How Table ADT can be implemented using Linked List ?

Answer (Please [click here](#) to Add Answer)

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Question No : 44 of 52

Marks: 2 (Budgeted Time 4 Min)

What is maximum level difference between two leaf nodes in a Heap? Justify your answer as well.

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Answer (Please [click here](#) to Add Answer)



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Question No : 45 of 52

Marks: 3 (Budgeted Time 6 Min)

What are the three basic things that are associated with data structures?

Answer (Please [click here](#) to Add Answer)



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"For smaller lists, linear insertion sort performs well, but for larger lists, quick sort is suitable to apply." Justify why?

Answer (Please [click here](#) to Add Answer)



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Question No : 47 of 52

Marks: 3 (Budgeted Time 6 Min)

The following array represents a heap structure:

1	2	3	4	5	6	7	8	9	10	11	12
97	76	61	42	54	59	31	23	17	44	49	

Insert a new value **86** into the heap. Show the resultant heap, after insertion, in the form of array

Answer (Please [click here to Add Answer](#))

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Question No : 48 of 52

Marks: 3 (Budgeted Time 6 Min)

What is an Equivalence relation? Give any two examples.

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Answer (Please [click here](#) to Add Answer)

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Here is an array of ten integers:

5 3 8 9 1 7 0 2 6 4

Sort the array by using **selection sort** algorithm and show content of array after each step.

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Answer (Please [click here](#) to Add Answer)



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Question No : 50 of 52

Marks: 5 (Budgeted Time 10 Min)

Insert nodes **59** and **77** into the following AVL tree. You have to balance the AVL tree.
Steps are not required. Only show the resultant AVL tree.



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Answer (Please [click here](#) to Add Answer)

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Why the given Binary tree is NOT a Heap? How can we make it Heap with minimum changes ?



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Answer (Please [click here](#) to Add Answer)

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Question No : 52 of 52

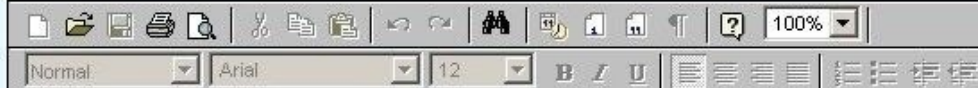
Marks: 5 (Budgeted Time 10 Min)

Write and explain the code for "Union" and "Find" operations of Parent array in disjoint sets.

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Answer (Please [click here](#) to Add Answer)



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