

## FINALTERM EXAMINATION

Fall 2009

**Question No: 1 ( Marks: 1 ) - Please choose one**

In an array we can store data elements of different types.

- ▶ True
- ▶ **False**

**Question No: 2 ( Marks: 1 ) - Please choose one**

Which one of the following statement is NOT correct .

- ▶ In linked list the elements are necessarily to be contiguous
- ▶ **In linked list the elements may locate at far positions in the memory (page 18)**
- ▶ In linked list each element also has the address of the element next to it
- ▶ In an array the elements are contiguous

**Question No: 3 ( Marks: 1 ) - Please choose one**

Doubly Linked List always has one NULL pointer.

- ▶ True
- ▶ **False(page 39)**

**Question No: 4 ( Marks: 1 ) - Please choose one**

A queue is a data structure where elements are,

- ▶ **inserted at the front and removed from the back. .(see example at page #89 nd 90)**
- ▶ inserted and removed from the top.
- ▶ inserted at the back and removed from the front.
- ▶ inserted and removed from both ends.

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**Question No: 5 ( Marks: 1 ) - Please choose one**

Each node in doubly link list has,

- ▶ 1 pointer
- ▶ **2 pointers(page 39)**
- ▶ 3 pointers
- ▶ 4 pointers

**Question No: 6 ( Marks: 1 ) - Please choose one**

I have implemented the queue with a linked list, keeping track of a front pointer and a rear pointer. Which of these pointers will change during an insertion into an *EMPTY* queue?

- ▶ Neither changes
- ▶ Only front pointer changes.
- ▶ Only rear pointer changes.
- ▶ **Both change.**

Since it is an empty queue the front and rear are initialize to -1, so on insertion both the pointers will change and point to 0.

**Question No: 7 ( Marks: 1 ) - Please choose one**

Compiler uses which one of the following to evaluate a mathematical equation,

- ▶ Binary Tree
- ▶ Binary Search Tree
- ▶ **Parse Tree(page 274)**
- ▶ AVL Tree

**Question No: 8 ( Marks: 1 ) - Please choose one**

If a complete binary tree has n number of nodes then its height will be,

- ▶  **$\log_2(n+1) - 1$ (page 139)**
- ▶  $2^n$
- ▶  $\log_2(n) - 1$
- ▶  $2^n - 1$

**Question No: 9 ( Marks: 1 ) - Please choose one**

If a complete binary tree has height  $h$  then its no. of nodes will be,

- ▶ Log ( $h$ )
- ▶  $2^{h+1} - 1$  (page 324)
- ▶ Log ( $h$ ) - 1
- ▶  $2^h - 1$

**Question No: 10 ( Marks: 1 ) <http://vustudents.ning.com> - Please choose one**

A binary relation  $R$  over  $S$  is called an equivalence relation if it has following property(s)

- ▶ Reflexivity
- ▶ Symmetry
- ▶ Transitivity
- ▶ All of the given options (page 387)

**Question No: 11 ( Marks: 1 ) - Please choose one**

Binary Search is an algorithm of searching, used with the \_\_\_\_\_ data.

- ▶ Sorted (page 432)
- ▶ Unsorted
- ▶ Heterogeneous
- ▶ Random

**Question No: 12 ( Marks: 1 ) - Please choose one**

If there are  $N$  elements in an array then the number of maximum steps needed to find an element using Binary Search is \_\_\_\_\_ .

- ▶  $N$
- ▶  $N^2$
- ▶  $N \log_2 N$
- ▶  $\log_2 N$  (page 440)

**Question No: 13 ( Marks: 1 ) - Please choose one**

Use of binary tree in compression of data is known as \_\_\_\_\_ .

- ▶ Traversal
- ▶ Heap
- ▶ Union
- ▶ Huffman encoding (page 287)

**Question No: 14 ( Marks: 1 ) - Please choose one**

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

- ▶ Equal to the small frequency
- ▶ Equal to the greater
- ▶ Equal to the sum of the two frequencies (page 293)
- ▶ Equal to the difference of the two frequencies

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**Question No: 15 ( Marks: 1 ) - Please choose one**

Which of the following statements is correct property of binary trees?

- ▶ A binary tree with N internal nodes has N+1 internal links.
- ▶ A binary tree with N external nodes has 2N internal nodes.
- ▶ **A binary tree with N internal nodes has N+ 1 external node. (page 303)**
- ▶ None of above statement is a property of the binary tree.

**Question No: 16 ( Marks: 1 ) - Please choose one**

Which of the following is a property of binary tree?

- ▶ A binary tree of N external nodes has N internal node.
- ▶ **A binary tree of N internal nodes has N+ 1 external node. (page 303)**
- ▶ A binary tree of N external nodes has N+ 1 internal node.
- ▶ A binary tree of N internal nodes has N- 1 external node.

**Question No: 17 ( Marks: 1 ) - Please choose one**

Which of the following statement is correct?

- ▶ A Threaded Binary Tree is a binary tree in which every node that does not have a left child has a THREAD (in actual sense, a link) to its INORDER successor.
- ▶ A Threaded Binary Tree is a binary tree in which every node that does not have a right child has a THREAD (in actual sense, a link) to its PREORDER successor.
- ▶ **A Threaded Binary Tree is a binary tree in which every node that does not have a right child has a THREAD (in actual sense, a link) to its INORDER successor. (Page 307)**
- ▶ A Threaded Binary Tree is a binary tree in which every node that does not have a right child has a THREAD (in actual sense, a link) to its POSTORDER successor.

**Question No: 18 ( Marks: 1 ) - Please choose one**

Which of the following statement is correct?

- ▶ A Threaded Binary Tree is a binary tree in which every node that does not have a left child has a THREAD (in actual sense, a link) to its INORDER successor.
- ▶ A Threaded Binary Tree is a binary tree in which every node that does not have a right child has a THREAD (in actual sense, a link) to its PREORDER successor.
- ▶ **A Threaded Binary Tree is a binary tree in which every node that does not have a left child has a THREAD (in actual sense, a link) to its INORDER predecessor.**
- ▶ A Threaded Binary Tree is a binary tree in which every node that does not have a right child has a THREAD (in actual sense, a link) to its POSTORDER predecessor.

**Question No: 19 ( Marks: 1 ) - Please choose one**

A Threaded Binary Tree is a binary tree in which every node that does not have a right child has a THREAD (in actual sense, a link) to its \_\_\_\_\_ successor.

- ▶ levelorder
- ▶ Preorder

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▶ **Inorder**     [Click here for detail](#)

▶ Postorder

**Question No: 20 ( Marks: 1 ) - Please choose one**

Which of the following statement is true about dummy node of threaded binary tree?

- ▶ This dummy node never has a value.
- ▶ This dummy node has always some dummy value.
- ▶ **This dummy node has either no value or some dummy value. .(page 321)**
- ▶ This dummy node has always some integer value.

**Question No: 21 ( Marks: 1 ) - Please choose one**

A complete binary tree is a tree that is \_\_\_\_\_ filled, with the possible exception of the bottom level.

- ▶ partially
- ▶ **completely (page 323)**
- ▶ incompletely
- ▶ partly

**Question No: 22 ( Marks: 1 ) - Please choose one**

A complete binary tree of height 3 has between \_\_\_\_\_ nodes.

- ▶ 8 to 14
- ▶ **8 to 15 (page 124)**
- ▶ 8 to 16
- ▶ 8 to 17

**Question No: 23 ( Marks: 1 ) - Please choose one**

We can build a heap in \_\_\_\_\_ time.

- ▶ **Linear (page 353)**
- ▶ Exponential
- ▶ Polynomial
- ▶ None of the given options

**Question No: 24 ( Marks: 1 ) - Please choose one**

Suppose that a selection sort of 100 items has completed 42 iterations of the main loop. How many items are now guaranteed to be in their final spot (never to be moved again)?

- ▶ 21
- ▶ 41
- ▶ **42     [Click here for detail](#)**
- ▶ 43

**Question No: 25 ( Marks: 1 ) - Please choose one**

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:

- ▶ 16, 18, 20, 22, 24, 28, 30

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- ▶ 16, 20, 18, 24, 22, 30, 28
- ▶ 16, 24, 18, 28, 30, 20, 22
- ▶ **16, 24, 20, 30, 28, 18, 22**      **It's not satisfy the min heap property**

**Question No: 26 ( Marks: 1 ) - Please choose one**

Which of the following statement is NOT correct about find operation:

- ▶ It is not a requirement that a find operation returns any specific name, just that finds on two elements return the same answer if and only if they are in the same set.
- ▶ **One idea might be to use a tree to represent each set, since each element in a tree has the same root, thus the root can be used to name the set.**
- ▶ Initially each set contains one element.
- ▶ Initially each set contains one element and it does not make sense to make a tree of one node only.

**Question No: 27 ( Marks: 1 ) - Please choose one**

Consider the following infix expression:

$$x - y * a + b / c$$

Which of the following is a correct equivalent expression(s) for the above?

- ▶  $x \ y \ -a \ * \ b \ +c \ /$
- ▶  $x \ *y \ a \ - \ b \ c \ / \ +$
- ▶  **$x \ y \ a \ * \ - \ b \ c \ / \ +$**       **Hint :-  $(x - y * a) + (b / c)$**
- ▶  $x \ y \ a \ * \ - \ b / \ + \ c$

**Question No: 28 ( Marks: 1 ) - Please choose one**

A complete binary tree of height \_\_\_\_ has nodes between 16 to 31 .

- ▶ 2
- ▶ 3
- ▶ **4 (page 124)**
- ▶ 5

**Question No: 29 ( Marks: 1 ) - Please choose one**

Here is an array of ten integers:

5 3 8 9 1 7 0 2 6 4

The array after the FIRST iteration of the large loop in a selection sort (sorting from smallest to largest).

- ▶ **0 3 8 9 1 7 5 2 6 4 (Page 477)**
- ▶ 2 6 4 0 3 8 9 1 7 5
- ▶ 2 6 4 9 1 7 0 3 8 5
- ▶ 0 3 8 2 6 4 9 1 7 5

**Question No: 30 ( Marks: 1 ) - Please choose one**

What requirement is placed on an array, so that *binary search* may be used to locate an entry?

- ▶ The array elements must form a heap.

- ▶ The array must have at least 2 entries.
- ▶ **The array must be sorted.** [Click here for detail](#)
- ▶ The array's size must be a power of two.

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