### Quiz #1

#### General Questions, Multiple Choice

Timed: 24 minutes Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

| **Question**  **#** | **Best**  **Answer** | **Guessed?**  **(yes or no)** |
| --- | --- | --- |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

#### Questions:

1. An algorithm for searching a large sorted array for a specific entry x compares every fourth item in the array to x until it finds one that is larger than or equal to x. Whenever a larger item is found, the algorithm examines the preceding three entries. If the array is sorted smallest to largest, which of the following describes all cases when this algorithm might use fewer comparisons to find x than would a binary tree search?

(A) It will never use fewer comparisons.  
(B) When x is very close to the beginning of the array.  
(C) When x is in the middle position in the array.  
(D) When x is very close to the end of the array.  
(E) It will always use fewer comparisions.

2. Study the function below:

int WhatIsIt(int x, int n) {  
 if (n==1)  
 return x;  
 else  
 return x \* WhatIsIt(x,n-1);  
 }

What value is returned by WhatIsIt(4,4)?

(A) 8 (B) 16 (C) 24 (D) 64 (E) 256

3. Which of the following is a necessary and sufficient condition for the function WhatIsIt to return a value if it is assumed that the values of n and x are small in magnitude?

int WhatIsIt(int x, int n) {  
 if (n==1)  
 return x;  
 else  
 return x \* WhatIsIt(x,n-1);  
 }

What value is returned by WhatIsIt(4,4)?

(A) n > 0  
(B) n = 0  
(C) n > 0 and x > 0  
(D) x <= n and n > 0  
(E) n <= x and n > 0

4. The procedure call Wow(16) will yield as output which of the following sequences of numbers?

void Wow (int n) {  
 if (n > 1)  
 Wow( n / 2);  
 cout << n << " ";  
 }  
  
  
(A) 10 8 6 4 2  
(B) 16 8 4 2 1  
(C) 1 2 4 8 16  
(D) 32 16 8 4 2  
(E) 2 4 8 16 32

1. Merging two sorted lists to yield a single sorted list requires which of the following?
2. That the two lists be external files.
3. That recursive techniques be used.
4. That at least one list be stored in memory.
5. That non-recursive techniques be used.
6. None of the above.

1. void Proc (int x, int y, int z)

{y = y + 1;z = z + x;}int main(){int a, b;a = 2;b = 3;Proc(a+b, a, a);cout << a;return 0;}What is printed by the above program?(A) 2 (B) 3 (C) 5 (D) 7 (E) 8

1. If the function heading in #6

void Proc(int x, int y, int z)were changed tovoid Proc(int x, int & y, int & z)what would be printed by the program in #6?(A) 2 (B) 3 (C) 5 (D) 7 (E) 8

1. If the inorder traversal of the binary tree T is:

A D B G C F Eand each node of T has either 0 or 2 children, which of the following nodes is NOT a leaf of that tree?(A) A (B) B (C) C (D) D (E) E

1. A property of binary trees is said to be an "inherited" property if each of the subtrees has the property whenever the binary tree itself does. One inherited property for binary trees is having:
2. an odd number of nodes
3. an even number of nodes
4. the same number of nodes in the left and right subtrees
5. at least 10 nodes
6. no node with exactly one child.

1. Consider the following function:

void Delete (Node\* P)

// Deletes the node pointed to by P from a doubly linked list.

// (without a dummy or header node) whose pointer fields are called,

// BackLink and NextLink

{

P->BackLink->NextLink = P->NextLink;

P->NextLink->BackLink = P->BackLink;

}

In which of the following cases will the function above fail to work properly?

* + 1. P points to the first node in the list.
    2. P points to the last node in the list.
    3. P = NULL

(A) III only (B) I and II only (C) I and III only (D) II and III only

(E) I, II and III

1. In a function, value parameters do not necessarily protect the contents of the caller�s data structures from being affected by execution of the function under which of the following conditions?
2. The function is recursive.
3. The value parameters are integers.
4. The value parameters are pointers.
5. The value parameters are arrays.
6. The function is used with a forward declaration.

Answers