Data Structures and Algorithm 1 Lab Final Quiz
Name:
Student ID:
Date: 10/12/2021
Duration: 40 Minutes

Select one or more answer choices according to the specific question directions.

Q1: We can insert a new node in linked list:		
☐ to the head	☐ any place (depending on the implementation)	☐ to the tail

Q2: Nodes address in the memory for a linked list data structure:		
☐ Must be continues	☐ can be discontinuous	☐ None

Q3: Array items address in the memory:		
☐ Must be continues	☐ can be discontinuous	☐ None of that

Q4: `delete` and `new` operation are for:		
☐ Dynamic memory allocation	☐ Object initialization	☐ Pointers

Q5: `delete` and `new` are found in which programming language(s):		
☐ C	☐ Python	☐ C++

Q6: `malloc` is used for:		
☐ None of that	☐ Dynamic memory allocation	☐ Free a memory resource

Q7: the next pointer in the tail node value of a linked list is:		
☐ NULL	☐ Head node address	☐ Next node address

Q8: Queue data structure principal is:		
☐ First In First Out	☐ Last In Last out	☐ Last In First Out

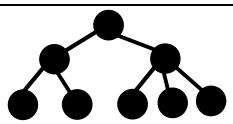
Q9: Stack data structure principal is:		
☐ First In First Out	☐ Last In Last out	☐ Last In First Out

Q10: If a stack has the following entries {7,9,6,8}* what is the content of stack after one `pop` operation: * 7 is the **front** and 8 is the **rear**		
☐ {9,6,8}	☐ {7,9,6}	☐ {7,9,6,8}

Q11: A Stack has the entries {7,9,6,8}* what is the content of stack after one `push(8)` operation: * 7 is the **front** and 8 is the **rear**		
☐ {7,9,6,8}	☐ {7,9,6,8,8}	☐ {8,7,9,6,8}

Q12: The C++ feature used to define multiple functions with same name but different definitions:		
☐ Class method	☐ Virtual function	☐ Function overloading

Q13: Is the following is a binary tree



☐ Yes	☐ No	

Q14: Which of the following data structures is used to implement a tree		
☐ Stack	☐ Array	☐ Linked List

Q15: Knowing the preorder traversing algorithm code is:

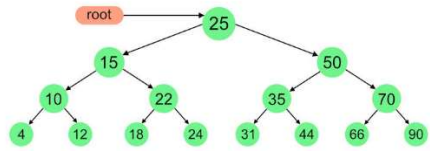
```
void printPreorder(struct Node* node)
{
   if (node == NULL)
      return;

   cout << node->data << " ";

   printPreorder(node->left);

   printPreorder(node->right);
}
```

Which of the following is the expected output for the following tree:

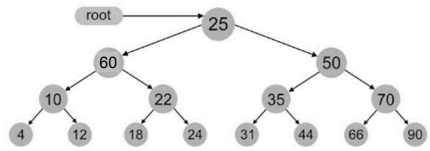


☐ 25,15,10,4,12,22,18,24,50,35,31,44,70,66,90	☐ 4,12,10,18,24,22,15,31,44,35,66,90,70,50,25	

Q16: The worst case of searching a number in a binary search tree is:

☐ Number of nodes	☐ Height/depth of the tree	☐ Number of leaf nodes

Q16: Is the following a binary search tree:



☐ Yes	☐ No	

Q17: Which one of the following represent the recursive calls stack for fib(4) knowing fib(4) = 3

```
int fib(int x) {
   if((x==1)||(x==0)) {
      return(x);
   }else {
      return(fib(x-1)+fib(x-2));
   }
}
```

☐

fib(4)
fib(3)
fib(2)
fib(1)
fib(0)
fib(1)
fib(2)
fib(1)
fib(0)

☐

☐

fib(4)
fib(2)
fib(0)
fib(1)
fib(3)
fib(1)
fib(2)
fib(1)
fib(0)