نموذج فاينل 471 مقرر CS214 موحد د. سامية و لمياء و خليل

5 marks

Doubly linked list allows traversal in both forward and reverse direction .1
✅ صح →
Delete node with two children from BST by promoting the left child .2
❌ خطأ →
In binary tree, node with no successor is called leaf node .3
✅ صح →
Linked list can grow and shrink in size during its lifetime .4
✅ صح →
In circular queue, the queue is reported as full when rear reaches maximum size .5
❌ خطأ →

5 marks

Which of the following principles describes the operation of a queue data structure?

Answer: First-In-First-Out

Q2) When implementing a stack using a linked list, where are new elements typically added to maintain efficiency?

Answer: At the beginning of the linked-list

Q3) What is the outcome of performing an “in-order” traversal on a Binary Search Tree?
Answer: The nodes in every subtree are visited in ascending order

Q4) An “output-restricted deque” places a limitation on which operation?
Answer: Deletion is restricted to one end only

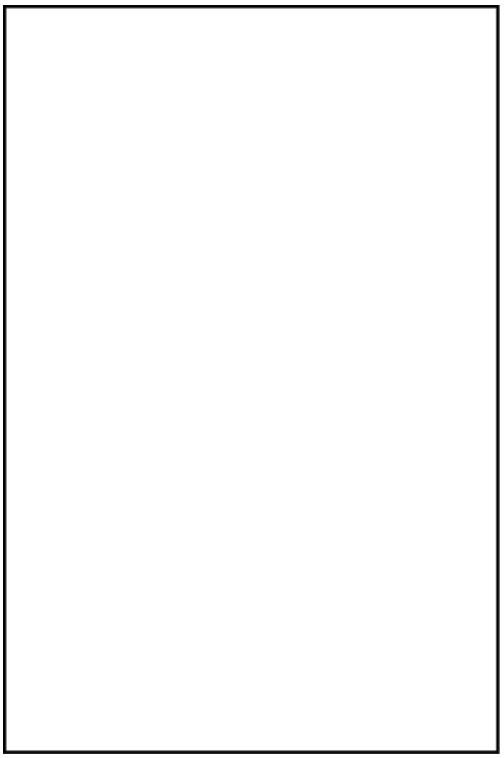
Q5) In the context of the del() function for a singly linked list, why is the “old” pointer necessary when deleting an intermediate node?

Answer: To update its link to point to the node after the node is deleted

ماني متاكده من الاسئله بالضبط خليت تشات جيبيتي يكتبها وحطيت اجوبتي حتى الاجوبه مو مره متأكده

6 marks

Write a recursive function which reverses the nodes of a linked list.



8 marks

Write a function stack::pop() that removes and returns the top element of a stack.

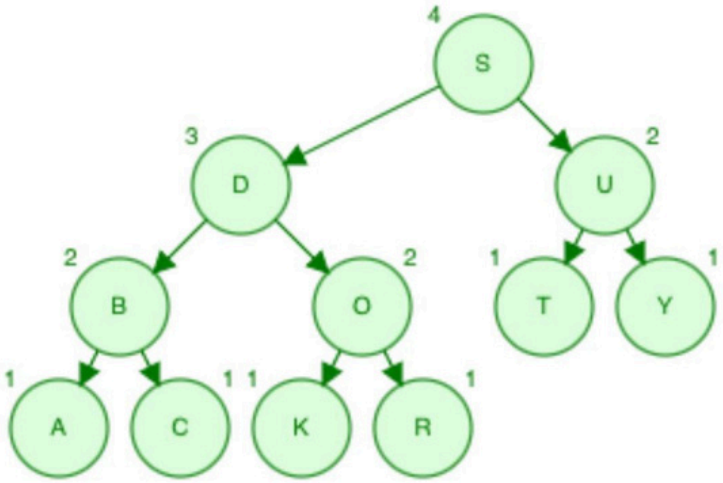
First, consider the stack implemented using an array, then consider the stack implemented using a linked list.

```
int stack:: pop()
{
//Remove the first element in list
    if (top == NULL)
    {
        cout << "Stack is empty" << endl;
        return NULL;
    }
    node *temp;
    int item;
    temp = top;
    item = temp -> data;
    top = top -> link;
    delete temp;
    return item;
}
```

```
int stack:: pop()
{
    if (top == -1)
    {
        cout << "Stack is empty" << endl;
        return NULL;
    }
    int data = arr[top];
    Arr[top] = 0;
    top--;
    return data;
}
```

10 marks

Construct an AVL tree
D A T S R U C B O K Y



6 marks

Given the following binary tree, write the Preorder, Inorder, and Postorder traversals.

Preorder traversal: _____

Inorder traversal: _____

Postorder traversal: _____

كانت مو مرتبه عشوائيه فا الان اوردر ناتجه غير مرتب من الصغير للكبير❌

10 mark

assume a circular queue of size 5 implemented , After each operation, write the values of front and rear.

الفراغات كانت عمود الفرونت و عمود الرير الباقي معطى بالسؤال

العملية	العنصر	Front	Rear
Initialization	—	-1	-1
Enqueue	10	0	0
Enqueue	40	0	1
Dequeue	10	1	1
Enqueue	20	1	2
Enqueue	30	1	3
Dequeue	40	2	3
Enqueue	50	2	4
Enqueue	60	2	0
Enqueue	70	2	1