Quiz – 3

Time allowed: 10 min

Stacks, Queues and Trees.

Name: _____ ID: _____

A. Select the correct option for the following questions. [5 marks]

1. What is the time complexity of a pop operation in a linked-list based stack?
    a. O(1)
    b. O(n log n)
    c. O(n) => not valid since we always push and pop at the head
    d. $O(n^2)$
2. What is the advantage of a array based stack compared to linked-list based stack?
    a. Faster dequeue
    b. Faster enqueue
    c. Array based stack have no real advantage to linked-list based stack
    d. Stack can be grown without any extra overhead
3. Circular queue resolves the following problem of a normal queue
    a. Lower memory overhead
    b. Slower but more stable dequeue
    c. Fast enqueue in O(log n)
    d. Fast dequeue in O(1)
4. In a tree of height 2, the root has 4 children. Only 2 children of the root have one child each. How many leaves to we have?
    a. ***Cannot*** determine
    b. (4-2) + 2 = 4
    c. (4%2) + 4 = 6
5. In a tree, number of children at level m is always larger than the number of children at level n where m < n?
    a. True
    b. False

B. What is the output when ***mystery(q)*** is called when q=[9,8,7,6,5]? [2 marks]

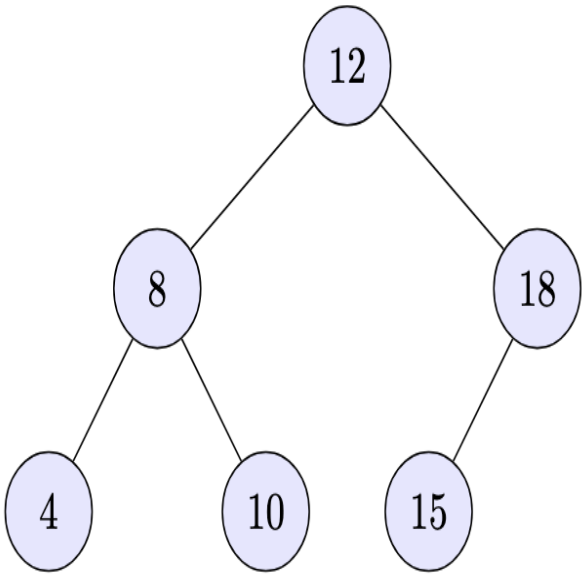
```
void mystery(queue<int> q) {
    while (!q.empty()) {
        int x = q.front();
        q.pop();
        if (!q.empty()) {
            int y = q.front();
            q.pop();
            q.push(x + y);
        }
    }
    while (!q.empty()) {
        cout << q.front() << " ";
        q.pop();
    }
}
```

Output: no output

C. What is the output when ***magic(root)*** is called on the given tree [3 marks]

```
struct Node {
    int data;
    Node* left;
    Node* right;
};

void traverse(Node* root) {
    if (!root) return;
    if (root->right)
        traverse(root->right);
    cout << root->data << " ";
    if (root->left)
        traverse(root->left);
}
```



Output: 18 15 12 10 8 4