Mid-Term 2: 2nd Practice Multiple Choice Questions

Question 1:

The preorder traversal sequence of a binary search tree is **30, 20, 10, 15, 25, 23, 39, 35, 42.** Which one of the following is the postorder traversal sequence of the same tree?

a. 10, 20, 15, 23, 25, 35, 42, 39, 30
b. 15, 10, 25, 23, 20, 42, 35, 39, 30
c. 15, 20, 10, 23, 25, 42, 35, 39, 30
d. 15, 10, 23, 25, 20, 35, 42, 39, 30

Question 2:

What will be printed when the following code is run ?

```
#include <iostream>
        struct Node {
                int key;
                Node* left;
                Node* right;
                Node(int k) {
                this->key = k;
                this->right = this->left = NULL;

                }
        };

        void print(Node* n, int k) {
                if (n == NULL) return;
                if ( n->key %2 == 0) {
                        std::cout << n->key << “ “;
                }
                print(n->left, k);
                print(n->right, k);
        }
        int main() {

                Node* root = new Node(12);
                root->left = new Node(6);
                root->right = new Node(15);
                root->left->left = new Node(2);
                root->right->right = new Node(8);

                print(root, 0);

        }
```

a. 12 6 2 8
b. 12 2 8
c. 12 6 2 15 8
d. 12 8 6 2

Question 3:

Consider a full binary tree where node in the tree has an address to the head of a linked list of length 10. This means that there is a linked list at every node of the tree which is of length 10. What is the maximum number of comparisons done to search for an element in this arrangement if the height of the full binary tree is 3. Assume that all elements are unique.

a. 7
b. 60
c. 150
d. 70

Question 4:

Consider a Hash Table of size 10. Collisions in this Hash Table are resolved using chaining. After insertion of a certain number of elements, the length of the chain in each of the Hash Table slots are as follows:

Slot-1: 3
Slot-2: 5
Slot-3: 6
Slot-4: 0
Slot-5: 5
Slot-6: 1
Slot-7: 9
Slot-8: 10
Slot-9: 21
Slot-10: 20

What is the number of collisions caused due to the insertion of the elements?

a. 71
b. 81
c. 91
d. 61

Question 5:

Which of the following is an advantage of adjacency list representation over adjacency matrix representation of a graph?

a. In adjacency list representation, space is saved for sparse graphs
b. DFS and BFS can be done in O(V + E) time for adjacency list representation. These operations take O(V^2) time in adjacency matrix representation. Here is V and E are number of vertices and edges respectively
c. Adding a vertex in adjacency list representation is easier than adjacency matrix representation
d. All of the above

Question 6:

Consider an undirected unweighted graph G. Let a breadth-first traversal of G be done starting from a node r. Let d(r, u) and d(r, v) be the lengths of the shortest paths from r to u and v respectively, in G. If u is visited before v during the breadth-first traversal, which of the following statements is correct?

a. d(r, u) < d (r, v)
b. d(r, u) > d(r, v)
c. d(r, u) <= d (r, v)
d. None of the above