

CDS RESEARCH INTERVIEW

COMPUTER SYSTEMS (CDS-CS) Written Component ...

Name:Appln. No.:

The test is for 30 MINUTES. You must answer ALL questions. There is no negative marking.

Your answers should include necessary explanation/rough work. Write everything on these sheets only.

Q1. head is the pointer to the head of a doubly linked list sorted in ascending order. Complete the function DeleteSorted() which takes a node's value deleteValue, and deletes its *first* occurrence from the doubly linked list.

```
struct node {
    int value;
    struct node *next;
    struct node *prev;
}
void DeleteSorted (struct node *head, int deleteValue) {
    struct node *previous, *current;
    previous = null; current = head;

    while (_____ && _____) {
        _____;
        _____;
    }
    if(current->value == deleteValue) {
        if(previous == null)
            _____;
        else
            _____;
        if(_____)
            _____;
    }
}
```

Q2. Consider a directed graph with V nodes and E edges. The graph is represented by two arrays, source `src[]` and destination `dest[]` each of size E , such that `src[i]` and `dest[i]` represent the nodes connected by edge, i . Fill the blanks in the following code fragment to find and print the node with the maximum outdegree.

```

for(i=0; i<V; i++){
    neighbors[i] = 0;
}
max_count=0;

for(i=0; i< _____; i++){

    neighbors[_____] _____ ;

    if(max_count_____){

        max_count = _____;

        max_node = _____;

    }

}
printf("Node with max out degree=%d", max_node);

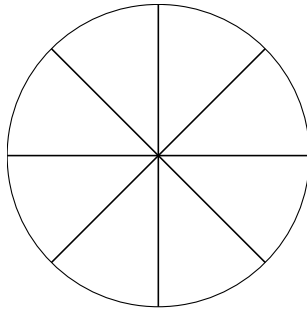
```

Q3. If the following numbers are inserted one-by-one into a binary search tree that is initially empty, show the structure of the tree after all the items are inserted: 36, 4, 75, 5, 7, 57, 74, 35, 9, 8
 Also show the binary search tree after it has been balanced to minimize its height.

Answer

Rough Work

Q4. Anand is preparing a pizza with 8 slices, and he has 10 toppings to put on the pizza. He can put only one topping on each slice but can use the same topping on zero or more slices. In how many unique ways can he prepare the slices so that the same topping is not used in adjacent slices?



Answer

Rough Work

Q5. One in two hundred people in a population have a particular disease. A test is developed for the disease. The test gives a false positive 3% of the time (i.e. reports that a person has the disease even when he/she does not), and a false negative 2% of the time (i.e. reports that a person does not have the disease even when he/she does).
Rahul takes the test and the report comes positive. What is the probability that Rahul has the disease?

Answer

Rough Work