

COP 3502

Final Exam

Sec 1 Date: 12/10/2021 (Fri)

Time: 7 AM - 9:50 AM

Loc: CBI-104

Show Up!

P6 is very challenging!

Don't feel bad if you only get the sample!

If you get more, it's an accomplishment

*MAY CHANGE RESTRICTIONS ON TEST CASES TO HELP YOU!

AIDS

3 sheets of notes front + back.

+ Foundation Exam Formula Sheet

Both Sec 1, Sec 2 will have the same test.

I'll make you stay until 9:40 AM.

Format :

Usual Short Answer / Coding / Problems you're used to seeing.

* Look at exam archive for old examples.

Sorted List Matching, Binary Search

Dynamic Mem Alloc

Recursion

Definitely

IQ { Linked Lists
Stacks / Queues

Math - Sums, Recurrences

yes!

Sorting (Tracing, rarely coding)
Algorithm Analysis Problems

ADV
Data
Structs

Binary Search Trees

AVL Trees

Tries

Heaps

Hash Tables

Base Conversion

Bitwise Ops

Definitely on

Binary Search

Backtracking

20% - 25%

Fall 13 Final Exam

Question 2

```
struct node* getPtrToMin (struct node* front) {  
    if (front == NULL) return NULL;  
    struct node* minPtr = front;  
    while (front != NULL) {  
        if (front->data < minPtr->data)  
            minPtr = front;  
        front = front->next;  
    }  
    return minPtr;  
}
```

Q5 $T(n) = 3T(n-1) + 1, T(0) = 0$

$$= 3[3T(n-2) + 1] + 1$$

$$= 9T(n-2) + (3+1)$$

$$= 9[3T(n-3) + 1] + (3+1)$$

$$= 27T(n-3) + (9+3+1)$$

After k steps $T(n) = 3^k T(n-k) + \sum_{i=0}^{k-1} 3^i$

Plug in $k=n$ $T(n) = 3^n T(0) + \sum_{i=0}^{n-1} 3^i = \frac{3^n - 1}{3 - 1} = \boxed{\frac{3^n - 1}{2}}$