

Persistent Systems Previous Paper Questions

A. Computer Algorithms

Q1. Time Complexity

Q2. Which of the following cannot be implemented efficiently in Linear Linked List

1. Quicksort
2. Radix Sort
3. Polynomials
4. Insertion Sort
5. Binary Search

Q3. In binary search tree , n=nodes, h=height of tree. Whats complexity?

1. $o(h)$
2. $o(n*h)$
3. $o(n\text{Log}n)$
4. $o(n*n)$
5. None

B. C Programs

Q1.

```
Printf("%d%d",i++,i++);
```

1. Compiler Dependent
2. 4 4
3. 4 3
4. 3 4
5. None of Above

Q2.

```
void main()  
{
```

```
printf("persistent");  
main();  
}
```

1. Till stack overflows
2. Infinite
3. 65535
4. 34423
5. None

Q3. Swapping

Q4. What does it do?

```
void f(int n)  
{  
  if(n>0)  
  {  
    if(A[i]>A[j])  
    swap();  
  }  
  else  
  f(n-1);  
}
```

1. Swap
2. Sort in Ascending order
3. Sort in Descending order
4. Computes permutation

Q5. Given a Fibonacci function

```
f1=1;f2=1  
fn=f(n-1)+f(n-2)
```

Which of the following is true?

1. Every Second element is even
2. Every third element is odd
3. The series increases monotonally
4. For $n > 2$, $f_n = \text{ceiling}(1.6 * f(n-1))$
5. None

C. Operating System

1. Where the root dir should be located

1. Anywhere on System disk

2. Anywhere on Disk

3. In Main memory

4. At a fixed location on Disk

5. At fixed location on System Disk

2. Problem on Concurrency

3. Problem on Round Robin Algorithm

D. General

Q1. If x is odd, in which of the following y must be even

1. $X+Y=5$
2. $2(X+Y)=7$
3. $2X + Y =6$
4. $X+2Y=7$

Q2. 1000! How many digits? What is the most significant and Least significant digit

E. Theory:

Q1. If a production is given

S -> 1S1
0S0
00
11

Q2. Context free grammar cannot recognize

1. if-then-else
2. var
3. loops
4. syntax
5. None

F. DBMS

Q1. If table A has m rows and table B has n rows then how many rows will the following query return

```
SELECT A.A1,B.B1  
FROM A,B  
WHERE A.A3=B.B3
```

1. $\leq(m*n)$
2. $m*n$
3. $\leq(m+n)$
4. $\geq(m+n)$ and $\leq(m*n)$
5. $m+n$

Q2. A Query optimizer optimizes according to which of the following criteria

1. Execution time
2. Disk access
3. CPU usage
4. Communication time
5. None

Q3. Which of the following is not a characteristic of a transaction

1. Atomicity
2. Consistency
3. Normalization
4. Isolation
5. Durability

Q4. The def. of Foreign key is there to support

1. Referential integrity
2. Constraint
3. None

Q5.

Process A Process B
WRITELOCK(X) WRITELOCK(Y)
READ(X) READ(Y)

1. The problem is serializable
2. The problem is not serializable
3. It can be run in parallel
4. None

PROGRAMMING SECTION :

(This consisted of Two programs to be solved in 1 hour.)

A sparse matrix is a matrix in which a node with val=0 is not represented. The whole matrix is represented by a Linked list where node typedef struct Node

```
{
  int row;
  int col;
  int value;
  sparsematrix next;
} Element, *sparsematrix;
```

The problem is, if there are two matrix given suppose m1 and m2, then add them and return the resultant sparse matrix. If suppose there are N functions say from 0,1,2,... N-1 and its given that A[i][j]=1 if the function I contains a call to function. j otherwise A[i][j]=0, then write a function that will form groups of related functions and print them line by line and at the end print the number of total groups