

## Persistent Technical Paper 2

### A. Computer Algorithms

1. Time Complexity
2. Which of the following cannot be implemented efficiently in Linear Linked List

List

1. Quicksort
2. Radix Sort
3. Polynomials
4. Insertion Sort
5. Binary Search
3. In binary search tree ,  $n$ =nodes,  $h$ =height of tree. What's complexity?

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

### B. C Programs

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

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

2. `void main()`

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

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

3. Swapping

4. 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
- 5.
5. Given a Fibonacci function

$f_1=1; f_2=1$

$f_n=f(n-1)+f(n-2)$  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
- 4.
- 5.

#### D. General

1. 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.  $X+2Y=7$
- 5.
2. 1000! How many digits? What is the most significant and Least significant

digit

- 3.
- 4.
- 5.

#### E. Theory

1. If a production is given  
 $S \rightarrow 1S1$   
 $0S0$   
 $00$

11

Then which of the following is invalid

1. 00101010100

2.

3.

4.

5.

2. Context free grammar cannot recognize

1. if-then-else

2. var

3. loops

4. syntax

5. None

3.

4.

5.

#### F. DBMS

1. 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.  $m+n$

2. 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

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

1. Atomicity

2. Consistency

3. Normalization

4. Isolation

5. Durability

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

1. Referential integrity

2. Constraint

3.

4.

5. None

## 5. Problem

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.
5. 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 sparsematrix.

If suppose there are N functions say from 0,1,2,... N-1 and it's given that  $A[i][j]=1$  if the function i contains a call to func. 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