SNS COLLEGE OF ENGINEERING

Kurumbapalayam (Po), Coimbatore – 641 107

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

COURSE NAME : 23CST207 - DATABASE MANAGEMENT SYSTEMS

II YEAR / IV SEMESTER

Unit 4- Transactions

Topic 2 : _____

H_2CO_3

ACID Properties

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ACID PROPERTIES

- **Atomicity**
- **Consistency**
- **Isolation**
- **Durability**

A - Atomicity

All or Nothing Transactions

C - Consistency

Guarantees Committed Transaction State

I - Isolation

Transactions are Independent

D – Durability

Committed Data is Never Lost

(c) http://blog.sqlauthority.com

- Atomicity: In a transaction involving two or more discrete pieces of information, either all of the pieces are committed or none are.
- Consistency: A transaction either creates a new and valid state of data, or, if any failure occurs, returns all data to its state before the transaction was started.
- Isolation: A transaction in process and not yet committed must remain isolated from any other transaction.
- Durability: Committed data is saved by the system such that, even in the event of a failure and system restart, the data is available in its correct state.

Atomicity

- **Atomicity**: This property ensures that either all the operations of a transaction reflect in database or none.
- Suppose Account **A** has a balance of 400$ & **B**has 700$. Account **A** is transferring 100$ to Account **B**. This is a transaction that has two operations a) Debiting 100$ from A's balance b) Creating 100$ to B's balance. Let's say first operation passed successfully while second failed, in this case A's balance would be 300$ while B would be having 700$ instead of 800$. This is unacceptable in a banking system. Either the transaction should fail without executing any of the operation or it should process both the operations. The Atomicity property ensures that.

Consistency

- To preserve the consistency of database, the execution of transaction should take place in isolation (that means no other transaction should run concurrently when there is a transaction already running).

Isolation & Durability

- **Isolation**: For every pair of transactions, one transaction should start execution only when the other finished execution. I have already discussed the example of Isolation in the Consistency property above.
- **Durability**: Once a transaction completes successfully, the changes it has made into the database should be permanent even if there is a system failure. The recovery-management component of database systems ensures the durability of transaction.

Evaluation

MCQ

1. Which of the following is not a property of transactions?
   a) Atomicity
   b) Concurrency
   c) Isolation
   d) Durability
   e) None of the mentioned

2.identify the characteristics of transactions
   a) Atomicity
   b) Durability
   c) Isolation
   d) All of the mentioned

THANK YOU