**Higher National Diploma in Information Technology**

**Object Relational Database Management Systems**

**Year 2 Semester 2**

**Tutorial – Transaction Management**

1. What is a Transaction?
2. Explain 4 properties of a Transaction with suitable examples.
3. Explain following terms with suitable examples
   1. Serial Schedule
   2. Equivalent schedule
   3. Concurrent Schedule
   4. Serializable schedule
4. Consider the following Schedule.

|  |  |  |  |
| --- | --- | --- | --- |
| Order of Execution | Transaction 1 | Transaction 2 | Transaction 3 |
| 1 |  | Begin |  |
| 2 | Begin |  |  |
| 3 | Read (P) |  |  |
| 4 |  | Read (Q) |  |
| 5 |  |  | Begin |
| 6 |  |  | Read (P) |
| 7 |  | Write(Q) |  |
| 8 |  |  | Read (Q) |
| 9 |  |  | Write(Q) |
| 10 |  | Abort |  |
| 11 | Commit |  |  |
| 12 |  |  | Abort |

1. What are the 3 Anomalies with a Concurrent Schedule?
2. Is the above schedule Serializable?
3. How does DBMS ensure Serializable schedule?
4. What are rules of Strict Two Phase Locking Protocol?
5. Consider the following Schedule.

|  |  |  |  |
| --- | --- | --- | --- |
| Order of Execution | Transaction 1 | Transaction 2 | Transaction 3 |
| 1 |  | Begin |  |
| 2 | Begin |  |  |
| 3 | S(P) |  |  |
| 4 |  | X(Q) |  |
| 5 |  |  | Begin |
| 6 |  |  | S (P) |
| 7 |  |  | Read (P) |
| 8 |  | Write(Q) |  |
| 9 | Read (P) |  |  |
| 10 | X(Q) |  |  |
| 11 |  | S(P) |  |
| 12 |  |  | X(Q) |

1. Is the above schedule Serializable?
2. Do you have a Deadlock in the above schedule?
3. State two methods that DBMS resolve deadlocks