Practice Problems for exam 3

1. Define a transaction.
2. Describe the types of problems that occur in a multi-user environment when concurrent access to the database is allowed. List example of these problems.
3. Explain the concepts of serial, nonserial and serializable schedules.
4. Define deadlock, give an example of a schedule with a deadlock.
5. Review the following precedence graphs
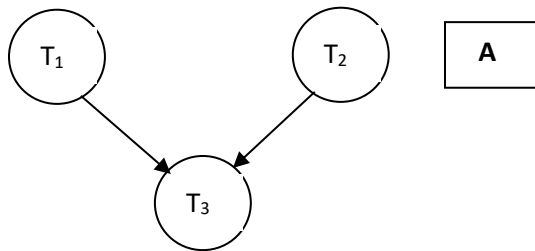
A. **True or False**: Schedule A is a serializable schedule.
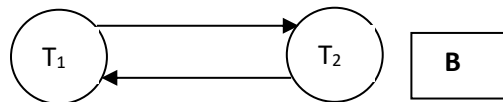
B. **True or False**: Schedule B is a conflict serializable schedule.

6. Describe the circumstances when the recovery manager has to 'redo' a transaction during the recovery process. Describe the circumstances when the recovery manager has to 'undo' a transaction during the recovery period.
7. Describe an algorithm associated with deadlock detection, describe an algorithm associated with deadlock prevention.
8. True/False An exclusive lock gives a transaction exclusive access to that data object.
9. True/False All relational database systems must implement a locking mechanism.
10. State why the *Wait-Die* deadlock prevention algorithm does not reassign the timestamp associated with the restarted transaction.
11. Describe the data models associated with the NoSQL databases.
12. Using Compass, write a filter for the sample_restaurants database that returns all restaurants that are in the borough Brooklyn and serves American cuisine.
13. Describe the CAP theorem.
14. State whether the following schedule is a serial schedule. State whether the following schedule is a conflict serializable schedule. State whether the following schedule is a recoverable schedule. Draw the precedence graph.

TIME1   READ(T1, X)

TIME2   READ(T2,X)

TIME3   WRITE(T1,X)

TIME4   WRITE(T2,X)

TIME5   COMMIT(T1)

TIME6   COMMIT(T2)