Marmara University – Faculty of Engineering – Department of Computer Engineering

Fall 2020 – CSE3055 Database Systems
Homework #9

Due: 22.01.2021.Fri 23:59

1) [20 pts] Five recovery techniques are listed below. For each situation described, decide which of the following recovery techniques is most appropriate.

- Backward recovery
- Forward recovery (from latest checkpoint)
- Forward recovery (using backup copy of database)
- Reprocessing transactions
- Switch

a) [5 pts] A phone disconnection occurs while a user is entering a transaction.

b) [5 pts] A disk drive fails during regular operations.

c) [5 pts] A lightning storm causes a power failure.

d) [5 pts] An incorrect amount is entered and posted for a student tuition payment. The error is not discovered for several weeks.

e) [5 pts] Data entry clerks have entered transactions for two hours after a full database backup when the database becomes corrupted. It is discovered that the journalizing facility of the database has not been activated since the backup was made.

2) [10 pts] What is the advantage of optimistic concurrency control compared with pessimistic concurrency control?

3) [10 pts] What is the difference between shared locks and exclusive locks?

4) [10 pts] What is the difference between deadlock prevention and deadlock resolution?

5) [10 pts] Briefly describe four DBMS facilities that are required for database backup and recovery.

6) [10 pts] What is transaction integrity? Why is it important?

7) [10 pts] List and describe four common types of database failure.

8) [10 pts] Briefly describe four threats to high data availability and at least one measure that can be taken to counter each of these threats.

9) [10 pts] List and briefly explain the ACID properties of a database transaction.