2011 Paper 5 Question 7

Concurrent and Distributed Systems

Database concurrency control enables multiple transactions to proceed simultaneously against a shared database.

(a) Give an example each of *conflicting* and *non-conflicting* operations on objects in a database. [2 marks]

(b) Explain how timestamp ordering (TSO) works, and how it responds to conflicts between transactions. [4 marks]

(c) Explain cascading aborts, and use an example to show how they can occur with TSO. [4 marks]

(d) Why is TSO not subject to deadlock? [2 marks]

(e) Explain why TSO distributes well, compared with two-phase locking. [4 marks]

(f) Construct a workload that performs badly under TSO, and explain why it does so. What could you do to improve its performance? [4 marks]