

CS304 Database System Concepts

Assignment 5

Due: March 20, 2012

(Please submit hard copies to class or to Zheng on due date.)

Name:

Matric No:

Q1. (2 points) Given a relational schema $r(A, B, C, D)$, does $A \twoheadrightarrow BC$ logically imply $A \twoheadrightarrow B$ and $A \twoheadrightarrow C$? If yes prove it, else give a counter example.

Q2. (2 points) Exercise 7.12 on page 307 of Text book.

Q3. (2 points) Explain why 4NF is a normal form more desirable than BCNF.

Q4. (2 points) Give an example of a relational-algebra expression and a query-processing strategy in each of the following situations:

- a) MRU is preferable to LRU.
- b) LRU is preferable to MRU.

Q5. (2 points) A power failure that occurs while a disk block is being written could result in the block being only partially written. Assume that partially written blocks can be detected. An atomic block write is one where either the disk block is fully written or nothing is written (i.e., there are no partial writes). Suggest schemes for getting the effect of atomic block writes with the following RAID schemes. Your schemes should involve work on recovery from failure.

a) RAID level 1 (mirroring)

b) RAID level 5 (block interleaved, distributed parity)