

2002 Paper 13 Question 8

Databases

- (a) Define the operators in the (core) relational algebra. [6 marks]
- (b) The core relational algebra is often extended with other operators. For the following operators give a definition and an example of their behaviour:
- (i) the full outer join operator; [3 marks]
- (ii) the aggregate and grouping operator. [5 marks]
- (c) X, Y and Z are all relations with a single attribute A . A naïve user wishes to compute the set-theoretic expression $X \cap (Y \cup Z)$ and writes the following SQL query.

```
SELECT X.A
FROM   X, Y, Z
WHERE  X.A=Y.A OR X.A=Z.A
```

- (i) Give the relational algebra term that this query would be compiled to. [2 marks]
- (ii) Does the SQL query satisfy the user's expectation? Justify your answer. [4 marks]