

2005 Paper 13 Question 8

Databases

(a) OLAP and OLTP.

(i) What is *on-line transaction processing* (OLTP)? [2 marks]

(ii) What is *on-line analytic processing* (OLAP)? [2 marks]

(iii) If you were designing a relational database system, how would your approach to schema design differ for OLTP and OLAP systems? [3 marks]

(iv) In OLAP, what is the meaning of the terms *drill down*, *roll up*, and *slice*? [3 marks]

(v) What is a *star schema*? [1 mark]

(b) Suppose we have the following relational schema,

```
Supplier(sid:integer, name:string, postcode:string)
Parts(pid:integer, name:string, description:string)
SuppliedBy(sid:integer, pid:integer, weight:integer)
```

where the underlined attributes represent the primary keys of the associated relation. The table *SuppliedBy* implements a relationship between suppliers and parts — indicating which parts are supplied by which supplier — using foreign keys pointing into the *Parts* and *Supplier* tables. The *weight* attribute is the parts weight in grams.

Write an SQL query that will return a list, without duplicates, of all postcodes associated with suppliers of parts less than one kilogram in weight. [5 marks]

(c) Define and explain the ACID properties of database transactions. [4 marks]