

## 1996 Paper 13 Question 9

### Databases

The international conference Extending Data Base Technology has arranged its next meeting in Avignon at the end of March, to coincide with the spring migration through the Camargue. Birders expect to add significant new sightings to the list of birds seen during a major database conference.

Delegates have been arguing for over a decade about the best relational model for the data. It is agreed that the following information should be recorded:

- the names of the major avifaunal regions: nearctic, western palæarctic, Australasia etc.
- for each birding delegate, a level of competence on a scale [1..5] within each avifaunal region
- good bird sites within each region (including all those visited during conferences), specifying the various habitat types occurring within each site
- observations made – by an observer, on a date, in a habitat type at some site, of a species belonging to a particular family of birds

Advise the delegates on a suitable relational schema for this database. [16 marks]

Explain what would be involved in processing the following queries in SQL.

- (a) What species of the kingfisher family have been observed both in a waterside habitat and in arid grassland? [2 marks]
- (b) Which delegate is recorded as having observed the greatest number of distinct species? [2 marks]