

1998 Paper 13 Question 9

Databases

Explain what is meant by a *referential integrity constraint* in a relational data model. [4 marks]

The University of Cambridge is determined to maintain its standards under increasing financial pressure. The government maintains league tables of various kinds: teaching quality, research rating, unit cost of each student place. The university still enjoys a high reputation worldwide, but it is in competition with institutions such as MIT and Stanford whose unit costs are much greater. The only way to provide facilities such as new research laboratories, graduate accommodation, a much-needed swimming pool, is by public appeal. It is vital that there is close liaison between the university development offices and colleges so that prospective donors do not become alienated by simultaneous demands.

You have been invited by the university to assist in recording details of its fund-raising. The main purpose is to coordinate the activities of *agencies* such as the university and college development offices in their dealings with *prospects*. The latter may be alumni of some college, charitable foundations or major companies with an educational commitment; it is important to record their *interests* (bioscience, student welfare, sport) so that they can be approached in a favourable context; also their potential resources, in order to maximise the possible benefit to the university. At any time a number of *projects* need funding: each will be developed by a single agency, requiring that a target sum be raised by a given date; projects will have one or more *purposes* which may be linked with the interests of prospects. The other main use of the database is to keep a *diary* of interaction with prospects; in order to retain their goodwill it is essential to know who has been invited where and when, and in what context.

Design the schema for a relational database that will record this information. State clearly any assumptions that you need to make in order to complete the design, and indicate any difficulties that you foresee in maintaining the database.

[16 marks]