

Question 1

Pesona Sukma VCD Rental Store Sdn Bhd. runs VCDs rental activities. Recently, the company has decided to build a database system in order to tackle its daily business processes. Described below are the business processes of the company:

Each customer will be assigned a unique customer number when he first makes his VCD rental. Some of the details about the customer that need to be stored are customer's name, gender, age, job title, telephone number and contact address.

The VCD in the store is identified by a unique code. Each one has VCD title, cost price and date purchased. Whenever a customer rents a VCD, the store needs to record the rent date, rent time, return date and the total charges. The rental fee for each VCD is RM2.00. A customer can rent several VCDs at a time.

The store owns several VCDs with the same movie title. Unique identifier will be assigned to each movie title. Other information on a movie includes a title and year produced. A movie is classified as either horror or comedy. Horror movie requires special costumes and make-up.

Each movie title is associated with one or more directors. The store has a unique code to identify each director. In addition to director code, other basic information such as name of the director and telephone number need to be stored too.

Each movie will also involve many actors. An actor can act in one or more movies. An actor is identified by actor identification number. In addition to that, name, birth date, telephone number and home address of the actor are also needed to be stored.

(You may provide any other relevant attributes for each entity and resolve all M:N relationships.)

- a) Based on the information given above, draw an Entity Relationship Diagram (ERD) using Crow's Foot notation that shows all the entities, attributes, relationships and connectivity.

(14 marks)

- b) Prepare the relational schema in 3NF for the ERD you have created in question a). Underline all the primary keys and understrike (*) all the foreign keys.

(6 marks)

Question 2

Multimedia College of Technology (MCT) provides sports facilities to be used not only by their students but also the public. To keep track of the booking information of the facilities, MCT hires a database designer to design and develop a database system according to the following requirements:

- The facilities provided by MCT include sports equipment, gymnasium, court for games like badminton, futsal and netball, football field and indoor games. Generally these facilities can be categorized into two categories which are equipment and venues. The information that should be recorded for facilities includes Fac_ID, Fac_Type, Fac_Name, Fac_Desc, and Fac_Rate. The equipment may have its own specific attribute such as unit availability while capacity is a special characteristic of the venues.
- A user can book many facilities and a facility can be booked by many users. Booking information needed such as UserID, facility that they want to book, time of used, date of used and quantity of equipments or number of venues they need.
- A user can be a student or the staff of MCT or they could be outsiders. The students or staff may use the sports equipment and venue for free but for the outsiders they will be charged. All types of users may have their own special characteristics that should be recorded.
- The staff of the sports center at MCT can record many bookings, and each booking is recorded by only one staff.

- a) Based on the information given above, draw an Entity Relationship Diagram (ERD) using Chen notation that shows all the entities, attributes, relationships and connectivity.

(14 marks)

- b) Prepare the relational schema in 3NF for the ERD you have created in question a). Underline all the primary keys and understrike (*) al the foreign keys.

(6 marks)