ERD_&_mapping_lab

(Note that the Identification number and Code are unique identifiers)

1. Intermediary Car rental company:

   An intermediary car rental company has branches across the city; intended to construct a system to facilitate its transactions. You are asked to build an ER diagram and mapping based on the following information.

   - The company has many offices to serve a big sector; each office has an ID, address and a contact no.
   - The owner who is willing to provide his car/s for rent to the office needs to register his full name, national ID as unique identifier and the bank account number to which the company will transfer the money to.
   - The owner must apply for car renting in only one office, but an office can have many owners.
   - Data about car is ID, model (brand, model name, model year), copy of a valid license, rent amount and car status (Ex: the car status is booked, in maintenance or available)
   - Owner can provide one or more cars to rent. In addition, it is not allowed to save a car information that is not related to specified owner. An owner must have at least one car to be registered in the system.
   - In regard to the tenant (the person who pays rent for car usage); some information needs to be saved, his National ID as a unique identifier, a copy of a valid driving license to secure the car and a mobile number as a contact.
   - A tenant should rent one or more cars and a car can be rented by many tenants.
   - When a tenant orders a car, some information about this transaction must be recorded such as the start date for renting the car, the duration, and payment method.

2. XX medical analysis laboratory

A medical analysis laboratory decided to design a system to facilitate data gathering and hence improve the service quality to reach the maximum result accuracy and patient satisfaction accordingly.

You are asked to draw an ER diagram and mapping based on the following information.

- The laboratory has branches in different locations; each branch has a code, short name, detailed address composed of city, street, and building no.
- There is a group of medical tests, which the branch provides.
  Each test has a code, name, cost, duration that each test takes until the result is ready.
- When the patient visits the branch to perform a test or more, there are some data needed about this patient to record by the system: patient ID, full name, age, mobile number, date of birth, gender, and chronic diseases.
- The system needs to save additional information when a patient visited a certain branch to perform specific test/s, this info is the date and time of performing the test.
- Finally, the system has to keep track of the employees working in each branch by storing employee ID, full name, salary, team (which employees belonging to ex: chemists' team, clean workers team, accountants' team, doctors team, etc.) and also we record the start and end time the employees spent to keep track of the duration (Ex: fixed hours from 8:00 am to 5:00 pm)
- . Each employee must be assigned in only one branch and each branch may have many employees.
- In addition, the direct supervisor of each employee has to be considered (if any).
- Every branch must have only one manager and a manager is not allowed to manage more than one branch.

3. XYZ take-away Restaurants:

XYZ, a take away restaurants chain needs to build a database System that helps to capture transactions with accuracy and run every day processes more efficiently. You are asked to draw an ER diagram and mapping based on the following information.

- There are many restaurant branches, each branch has an Identification number beside its address and contact number.

- Each branch has its own staff members, which belong to this branch, one member of this staff acts as the branch manager. Each branch must have one manager.

- Each Staff member described by the employee's full name, ID, age, address that is described as (city and region), role, joining date and monthly salary.

- The system is required to track the customers' information. Each customer has a code on the system, name, and a contact number.

- The system is asked to record the menu items provided by each branch. Data about menu item is the code, item name, unit price, item category (e.g. pizza, beverage ...).

- In addition, it is important to track the orders information placed by customers; each order has an ID, desired address to send the order to, total bill as well as the items ordered. The date and time of the placed order are important information to save.

- Each order has one or more menu items.

- Some information needs to be stored about the delivery boys, the national ID number, contact number, and names, to communicate in case there are orders required to be delivered.

4. <u>International school database system:</u>

A well-known international school seeks to develop a database for its system to ease the data handling process. You are asked to build an ERD and mapping based on the below information.

- Each student of the school has an application (only one) with a unique serial number, furthermore the division in which the student joins (example: American, National or British division).

- Each student is asked to fill in a medical report form with the commencement of joining the school. The medical report has data of weight, length and if the student suffering from any disease/s. There is no need for the student's medical report if he/she left our school.

- Every student has his/her own medical report to help in tracking and caring.

- Data about the student are Serial Number, full name, age, gender, date of birth and a copy of completion certificate of his/her last academic year, besides; the school creates an email for each student which has to be added to his record.

- Some students may have siblings in our school; the system has to save this piece of information to consider sibling discount percent.

- The sibling discount recorded.

- The system is required to save information about parents. Parent ID, name, relationship (father/mother).

- On the other hand, the system has to keep track of teacher entity which has attributes; teacher ID, name, subject, phone number, email address and monthly salary.

- Also there is a senior teacher for each group of teachers which teach certain subject, acts as a subject head.

- Each group of students attends in certain class. In addition, the class is dedicated only for them. The class has a unique name, location (building no, floor no), class capacity and attached schedule.

- The system has to save which teacher joins which class.