Unit-1 Experiential Learning

1.Construct an E-R diagram for a car insurance company whose customers own one or more cars each. Each car has associated with it zero to any number of recorded accidents.

2. In a university, there are several departments, and each department has a head of department who belongs to Faculty. Department have a name, phone extension, specific mailing address and Students that belong to the department. Students can belong to only one Department at a time and Department can have more than one or no Student. Students and faculty have names and unique identification numbers, with address, age, gender, and other information. Student studies different Courses offered by university. Faculty teaches these *Courses*. In each semester one student can take more than one course and Faculty can teach more than one courses. Faculty members can teach in multiple Departments. Each course can be taught by many faculty members or no one Faculty members are also working on multiple research projects. These projects are funded by government and university. One project can have more than one faculty member and one faculty member can work on more than one project.

3. Suppose you are given the following requirements for a simple database for the National Hockey League
(NHL):
• the NHL has many teams,
• each team has a name, a city, a coach, a captain, and a set of players,
• each player belongs to only one team,
• each player has a name, a position (such as left wing or goalie), a skill level, and a set of injury records,
• a team captain is also a player,
• a game is played between two teams (referred to as host team and guest team) and has a date (such
as May 11th, 1999) and a score (such as 4 to 2).
Construct a clean and concise ER diagram for the NHL database using the Chen notation.

4. XYZ hospital is a multi-specialty hospital that includes a number of departments, rooms, doctors, nurses, compounders, and other staff working in the hospital. Patients having different kinds of ailments come to the hospital and get checkup done from the concerned doctors. If required, they are admitted in the hospital and discharged after treatment. The aim of this case study is to design and develop a database for the hospital to maintain the records of various departments, rooms, and doctors in the hospital. It also maintains records of the regular patients, patients admitted in the hospital, the check-up of patients done by the doctors, the patients that have been operated, and patients discharged from the hospital.

Description:
In hospital, there are many departments like Orthopaedic, Pathology, Emergency, Dental, Gynaecology, Anaesthetics, I.C.U., Blood Bank, Operation Theatre, Laboratory, M.R.I., Neurology, Cardiology, Cancer Department, Corpse, etc. There is an OPD where patients come and get a card (that is, entry card of the patient) for check up from the concerned doctor. After making entry in the card, they go to the concerned doctor's room and the doctor checks up their ailments. According to the ailments, the doctor either prescribes medicine or admits the patient in the concerned department. The patient may choose either private or general room according to his/her need. But before getting admission in the hospital, the patient has to fulfil certain formalities of the hospital like room charges, etc. After the treatment is completed, the doctor discharges the patient. Before discharging from the hospital, the patient again has to complete certain formalities of the hospital like balance charges, test charges, operation charges (if any), blood charges, doctors' charges, etc. Next, we talk about the doctors of the hospital. There are two types of the doctors in the hospital, namely, regular doctors and call on doctors. Regular doctors are those doctors who come to the hospital daily. Calls on doctors are those doctors who are called by the hospital if the concerned doctor is not available.

5. The high court of Karnataka has several sub courts which handle a lot of cases on a daily basis. Each case can be represented by one or more attorneys. Each sub court can handle any number of cases. There is no restriction on the number of judges being associated with a sub court.

6. The following is a description of some data requirements for a chain of pharmacies. Draw the appropriate entity-relationship (E-R) diagram. Clearly show all cardinality constraints, cardinality limits, and existence dependencies.

     a) A pharmaceutical company manufactures one or more drugs, and each drug is manufactured and marketed by exactly one pharmaceutical company.

     b) Drugs are sold in pharmacies. Each pharmacy has a unique identification. Every pharmacy

     c) sells one or more drugs, but some pharmacies do not sell every drug.

     d) Drug sales must be recorded by prescription, which are kept as a record by the pharmacy. A prescription clearly identifies the drug, physician, and patient, as well as the date it is filled.

     e) Doctors prescribe drugs for patients. A doctor can prescribe one or more drugs for a patient and a patient can get one or more prescriptions, but a prescription is written by only one doctor.

     f) Pharmaceutical companies may have long-term contracts with pharmacies and a pharmacy can contract with zero, one, or more pharmaceutical companies. Each contract is uniquely identified by a contract number.

7. The Prescriptions-R-X chain of pharmacies has offered to give you a free lifetime supply of medicine if you design its database. Given the rising cost of health care, you agree. Here's the information that you gather:

• Patients are identified by an SSN, and their names, addresses, and ages must be recorded.

• Doctors are identified by an SSN. For each doctor, the name, specialty, and years of experience must
be recorded.

• Each pharmaceutical company is identified by name and has a phone number.

• For each drug, the trade name and formula must be recorded. Each drug is sold by a given pharmaceutical company, and the trade name identifies a drug uniquely from among the products of that company. If a pharmaceutical company is deleted, you need not keep track of its products any longer.

• Each pharmacy has a name, address, and phone number.

• Every patient has a primary physician. Every doctor has at least one patient

• Each pharmacy sells several drugs and has a price for each. A drug could be sold at several pharmacies, and the price could vary from one pharmacy to another.

• Doctors prescribe drugs for patients. A doctor could prescribe one or more drugs for several patients, and a patient could obtain prescriptions from several doctors.

• Each prescription has a date and a quantity associated with it. You can assume that, if a doctor prescribes the same drug for the same patient more than once, only the last such prescription needs to be stored.

• Pharmaceutical companies have long-term contracts with pharmacies. A pharmaceutical company can contract with several pharmacies, and a pharmacy can contract with several pharmaceutical companies. For each contract, you have to store a start date, an end date, and the text of the contract.

• Pharmacies appoint a supervisor for each contract. There must always be a supervisor for each contract, but the contract supervisor can change over the lifetime of the contract.

Draw an ER diagram that captures the preceding information. Identify any constraints not captured by the ER diagram.