**ERD Problems**

**Problem 1: Library Management System**

Design a database for a library system. The system keeps track of each book in the library. Data recorded about each book are (ISBN, Title, Author, Publisher and if it is available for borrowing or not). One or more authors may write a book. Each author has a name and an address. Each book is published through one publisher only. Each publisher has a Name, Address and more than one Phone. ~~Library members can borrow just one book at a certain time.~~ Borrowing date and return date must be recorded for every borrowed book. Each member has an ID, Name, Address and membership type (Premium / Regular).

**Problem 2: University Management System**

1. Assiut University is divided into several faculties: Faculty of Arts, Faculty of Engineering...etc. Each faculty is administrasted by a dean.

2. Each Faculty is composed of several departments.

3. Each department offers several courses.

4. Each department employs several professors, but each professor is assigned to a single department.

5. Each department is chaired by a department chair, who is a professor.

6. Each professor may teach several courses. A professor may also be on research contract and teach no courses at all.

7. Each course is taught by several professors.

8. Each student can enroll in several courses.

9. Each student has an advisor in his department. Each advisor advises several students. An advisor is also a professor, but not all professors advises students.

Teaches

Advises

**Student**

Enrolls

Has

**Course**

Employs

**Professor**

**Department**

**Problem 3: Premier Construction Company**

Premier Construction erects buildings at a variety of locations. Each building requires number of different types of materials in quantities that may vary by building. Different crews carry out different portions of the project. For example, there may be a crew for farming, a crew for drywall, a crew for plumbing, a crew for masonry, and so on. In scheduling the construction of a building, Premier assigns different crews to different dates. Workers are assigned to different crews, depending on their skills. Thus, worker Bank Brigman can do both carpentry and masonry work so is assigned at various times to farming, drywall and masonry crews. The size of a crew varies according to the size and requirements of the building. Consequently, crews are made up as needed for a particular building. Also, a supervisor is assigned to a particular crew for a particular building. A worker can be a supervisor on one crew and simply a worker on another crew. Marcus Brown, owner of Premier, wants to know which of his workers are assigned to crews for various buildings, what materials are being used for the buildings, and when work on each building is scheduled.

**Problem 4: International Magazine**

An international magazine wants to keep track of its published articles. The manager needs answers to questions such as the following:

*How many articles do we have for each department (e.g. sports, politics…etc.)?*

*Which journalist wrote that article?*

*At which department does that journalist work?*

*When has been that article written?*

*How many registered visitors read that articles?*

*What are the comments, written by visitors, for that article?*

*What are the images attached with that article?*

*Who is the journalist that head that department?*