**Database and file Management Systems** (CIS 2109)

**Homework 05**

1. Answer the following questions from your book:

**Chapter 2**

**Problem 01**

From the book: 2.23

**Problem 02**

From the book: 2.45

**Problem 03**

An art museum owns a large volume of artworks. Each artwork is described by an item Id, (identifier), title, type, and size; size is further composed of height, width, and weight. A work of art is developed by an artist, but the artist for some works is unknown. An artist is described by an artist ID (identifier), name, date of birth, and date of death (which is null for still living artists). Notice that the name of the artist is a composite attribute, composed of first, last and preferred names and it cannot be empty. The artist DOB is also required). Data about both artists of works currently owned by the museum and artists that have otherwise been featured in the museum are kept in the database. At any point in time, a work of art is either on display at the museum, held in storage, away from the museum as part of a traveling show, or on loan to another gallery. If on display at the museum, a work of art is also described by its location within the museum. A traveling show is described by a show ID (identifier), and the start and end dates of the show. Many of the museum works may be part of a given show, and only active shows with at least one museum work of art need be represented in the database. Every show may be visiting multiple cities and therefore has a schedule associated with it, listing the city visited, the start and end dates and the contact phone number. There may be more than 1 contact phone numbers and all the attributes are required. Notice that there is only one schedule associated with each show but the same schedule can be used more than once for shows that are travelling together. Only schedules that have been used for shows are stored in the database. Finally, another gallery is described by a gallery ID (identifier), name, and city. The museum wants to retain a complete history of loaning a work of art to other galleries, and each time a work is loaned, the museum wants to know the date the work was loaned and the date it was returned. As you develop the ERD for this problem, follow good data naming guidelines.

**Problem 04**

Each publisher has a unique name; a telephone number and a Contact Person. The contact person has a first and last name. A publisher publishes one or more books; a book is published by exactly one publisher. A book is identified by its ISBN, and other attributes are title, Last name of the first author, price, and number of pages. Each book is written by one or more authors; but there may be books with unknown authors. An author writes one or more books, potentially for different publishers. Each author is uniquely described by an author ID, and we know each author’s name address and DOB. Notice that every author may have multiple addresses each composed of Street, Number, City and State. For each book that each author publishes he reaches an agreement with the publisher’s office and based on this the author is paid a certain royalty percentage on each book he or she authors, which is different for each book and for each author. An author then receives a separate royalty check for each book he or she writes. Each check is identified by its check number, and we also keep track of the date and amount of each check.

**Chapter 3**

**Problem 05**

For a small neighborhood gas fireplace store, the entity type OFFERING has three subtypes: INSTALLATION, REPAIR, MAINTENANCE. Draw a separate EER diagram segment for each of the following situations:

1. At a given time, an offering must be exactly one of these subtypes.
2. An offering may or may not be one of these subtypes. On the other hand, an offering may be any two (or even four) of these subtypes at the same time
3. An offering may or may not be one of these subtypes. However, an offering that is one of these subtypes cannot at the same time be one of the other subtypes
4. At a given time, an offering must be at least one of these subtypes

**Problem 06**

A technology company provides offerings to its customers. Offerings are of two separate types: products and services. Offerings are identified by an offering ID and an attribute of description. In addition, products are described by product name, standard price, and date of first release; services are described by name of the company’s unit responsible for the service and conditions of service. There are repair, maintenance, and other types of services. A repair service has a cost and is the repair of some product; every repair is about 1 product and for every product we may have multiple repairs even for the same customer. A maintenance service has an hourly rate and is associated with a customer, not a specific product. Every customer may schedule any number of maintenance services each on a specific date and time. Fortunately, some products never require repair. However, there are many potential repair services for a product. A customer may purchase an offering, and the company needs to keep track of when the offering was purchased and the contact person for that offering with the customer. Unfortunately, not all offerings are purchased. Customers are identified by customer ID and have descriptive data of name, address, and phone number. When a service is performed, that service is billed to some customer. Be-cause some customers purchase offerings for their clients, a customer may be billed for services he or she did not purchase, as well as for ones that were purchased. When a customer is billed for a service (although some may never require a service of any type), the company needs to keep track of the date the service was performed, the date the bill is due, and the amount due.

**Problem 07**

Law Firm: Each case handled by the firm has a unique case number; a case date opened, case date closed, and judgment description are also kept on each case. A case is brought by one or more plaintiffs, and the same plaintiff may be involved in many cases. A plaintiff has a requested judgment attribute. A case is against one or more defendants, and the same defendant may be involved in many cases. A plaintiff or defendant may be a person or an organization. Over time, the same person or organization may be a defendant or a plaintiff in cases. In either situation, such legal entities are identified by an entity number, and other attributes are name and net worth.

Deliverables: One word document with your answers. Note: You can use Oracle developer to draw your answers but you can also simply draw the answer and include the photos in your answer document.