**Department of Applied Mathematics**

**Delhi Technological University**

**Database Management System (MC 302)**

**Assignment 1**

**Last Date of submission: 30 January, 2019**

**Plagiarism/copying will be punished.**

Use the information given in the questions to draw appropriate ER models.

Q1. A record company wishes to use a computer database to help with its operations regarding its performers, recordings and song catalogue. A requirements analysis has elicited the following information:

1. Songs have a unique song number, a non-unique title and a composition date. A song can be written by a number of composers; the composer’s full name is required. Songs are recorded by recording artists (bands or solo performers). A song is recorded as a track of a CD. A CD has many songs on it, called tracks. CDs have a unique record catalogue number, a title and must have a producer (the full name of the producer is required). Each track must have the recording date and the track number of the CD.
2. A song can appear on many (or no) CDs, and be recorded by many different recording artists. The same recording artist might re-record the same song on different CDs. A CD must have only 1 recording artist appearing on it. CDs can be released a number of times, and each time the release date and associated number of sales is required.

Q2. A library service wants to create a database to store details of its libraries, books and borrowers. Details include the following: A book has a unique ISBN number, a title and one or more authors. The library service may own several copies of a given book, each of which is located in one of the service’s libraries. A given library contains many books, and in order to distinguish different copies of the same book a library assigns a different copy-number to each of its copies of a given book; the price that was paid for each copy is also recorded. Every library has a unique name and is either a main library or a branch library. A main library may have zero or more branch libraries and every branch library is a branch of exactly one main library. A borrower has a name and a unique ID code. A borrower can have many books on loan, but each copy of a book can only be on loan to one borrower. A borrower could borrow the same book on several occasions, but it is assumed that each such loan will take place on a different date.

Q3. Assume we have the following application that models soccer teams, the games they play, and the players in each team. In the design, we want to capture the following:

* We have a set of teams, each team has an ID (unique identifier), name, main stadium, and to which city this team belongs.
* Each team has many players, and each player belongs to one team. Each player has a number (unique identifier), name, DoB, start year, and shirt number that he uses.
* Teams play matches, in each match there is a host team and a guest team. The match takes place in the stadium of the host team.
* For each match we need to keep track of the following:
  + The date on which the game is played
  + The final result of the match.
  + The players participated in the match. For each player, how many goals he scored, whether or not he took yellow card, and whether or not he took red card.
  + During the match, one player may substitute another player. We want to capture this substitution and the time at which it took place.
* Each match has exactly three referees. For each referee we have an ID (unique identifier), name, DoB, years of experience. One referee is the main referee and the other two are assistant referee.