1. (30 points) An ER diagram for a sports database is given below. The ER diagram represents GAME between two teams as a recursive relation. team1 and team2 are the role names for the recursive relation. score1 and score2 are the two attributes of the GAME relation, representing the scores of team 1 and team 2, respectively. Not all the attributes are included in the given ER diagram. The ER diagram given is only a sample and you may need to change the types (e.g., relation type) to capture all the specifications given below. Modify and extend the ER diagram given to include the following:

(a) Dates for the games, the stadium they are played at and total ticket sales for the game.

(b) Individual player score playing for a team in a game (e.g., soccer).

(c) Individual team score in a game with no individual player scores (e.g., American football).

(d) Individual player scores in a game with no team scores (e.g., golf).

(e) Average score for a player over all games played by the player, as a computed (derived) attribute.

(f) Average team score over all games, as a computed attribute.

(g) Average player score as a computed attribute over all games playing for a particular team. A player can switch teams over time, thus a player will have multiple average scores due to the player playing for different teams.

(h) Add appropriate cardinality ratios to the ER diagram you are creating and give your assumptions.

2. (20 points) Give an EER diagram for the following:

You should have at least one weak entity type and at least one class-subclass relation. You may include comments at the bottom of your
EER diagram to indicate your assumptions on the meaning of some of the following specifications.

A General Hospital consists of a number of specialized wards (such as Maternity, Pediatric, Oncology, etc). Each ward hosts a number of patients, who were admitted on the recommendation of their own GP (General practice Physician) and confirmed by a consultant physician employed by the Hospital. On admission, the personal details of every patient are recorded. A separate register is to be held to store the information of the tests undertaken and the results of a prescribed treatment. A number of tests may be conducted for each patient. Each patient is assigned to one leading consultant but may be examined by another doctor, if required. Doctors are specialists in some branch of medicine and may be leading consultants for a number of patients, not necessarily from the same ward.

EER diagram is on the following page.
Figure 1: Modified ER Model

PHYSICIANS

SPECIALISTS

O

examines

N

M

SPECIALISTS

CP

GP

confirmed

Recomend

PAITENTS

N

M

PAITENTS

TESTS

TREATMENTS

REGISTER

RESULTS

ADMISSIONS

HOSPITALS

1

N

employed by

consistsOf

WARDS

for

N

M

GP: General Physicians, CP: Consultant Physicians, LC: Leading consultant

Assumptions: GP also recommends a Ward and CP also confirms a Ward.

Comments: wordName: {Maternity, Pediatric, Oncology, ...}