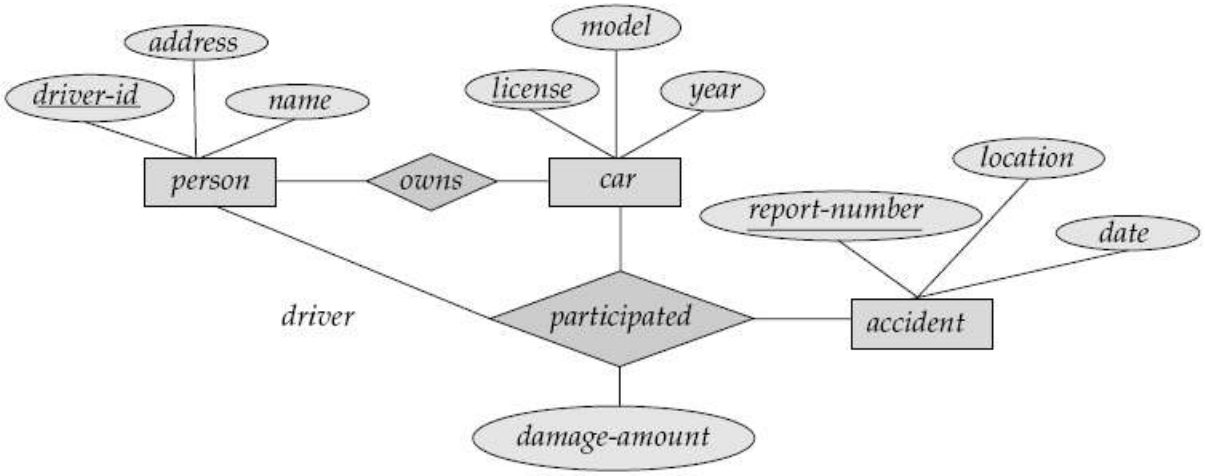
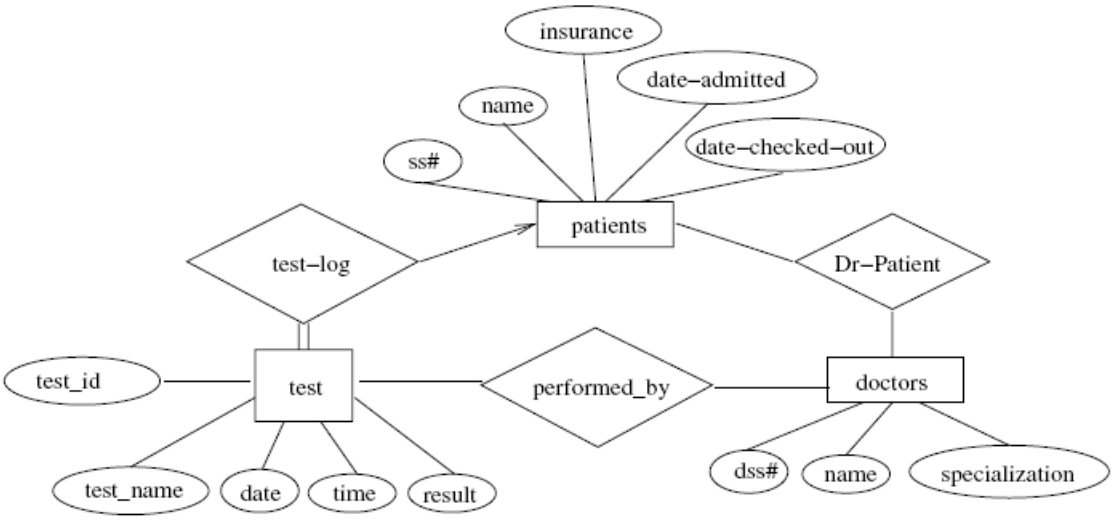
TUTORIAL SHEET - 1 (ER DIAGRAM)

Construct an E-R diagram for the following problems:

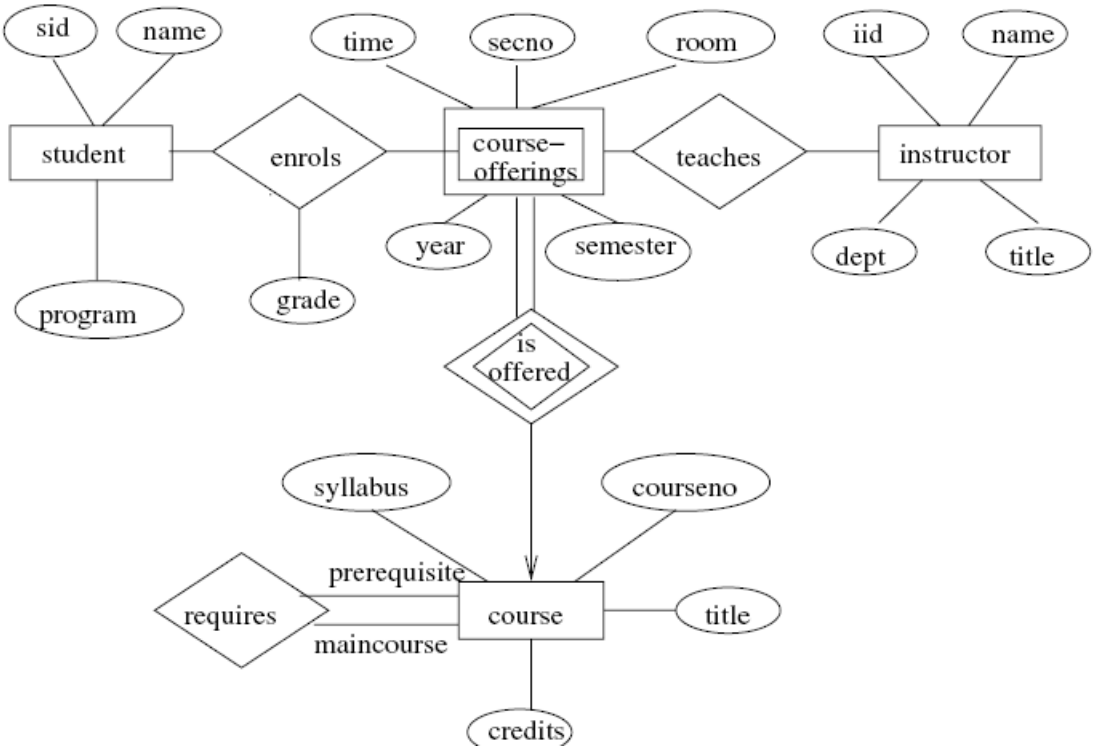
1) A car-insurance company whose customers own one or more cars each. Each car has associated with it zero to any number of recorded accidents.



2) A hospital with a set of patients and a set of medical doctors. Associate with each patient a log of the various tests and examinations conducted.

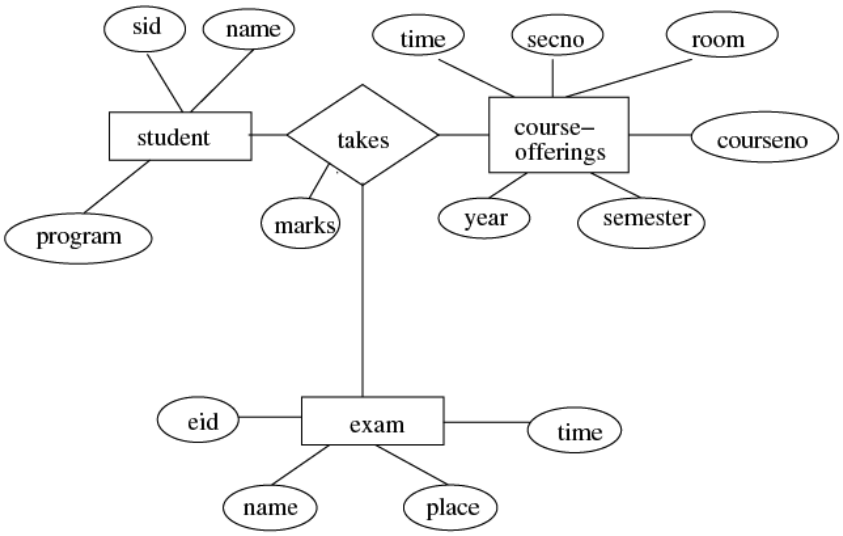


3) A university registrar's office maintains data about the following entities: (a) courses, including number, title, credits, syllabus, and prerequisites; (b) course offerings, including course number, year, semester, section number, instructor(s), timings, and classroom; (c) students, including student-id, name, and program; and (d) instructors, including identification number, name, department, and title. Further, the enrollment of students in courses and grades awarded to students in each course they are enrolled for must be appropriately modeled.

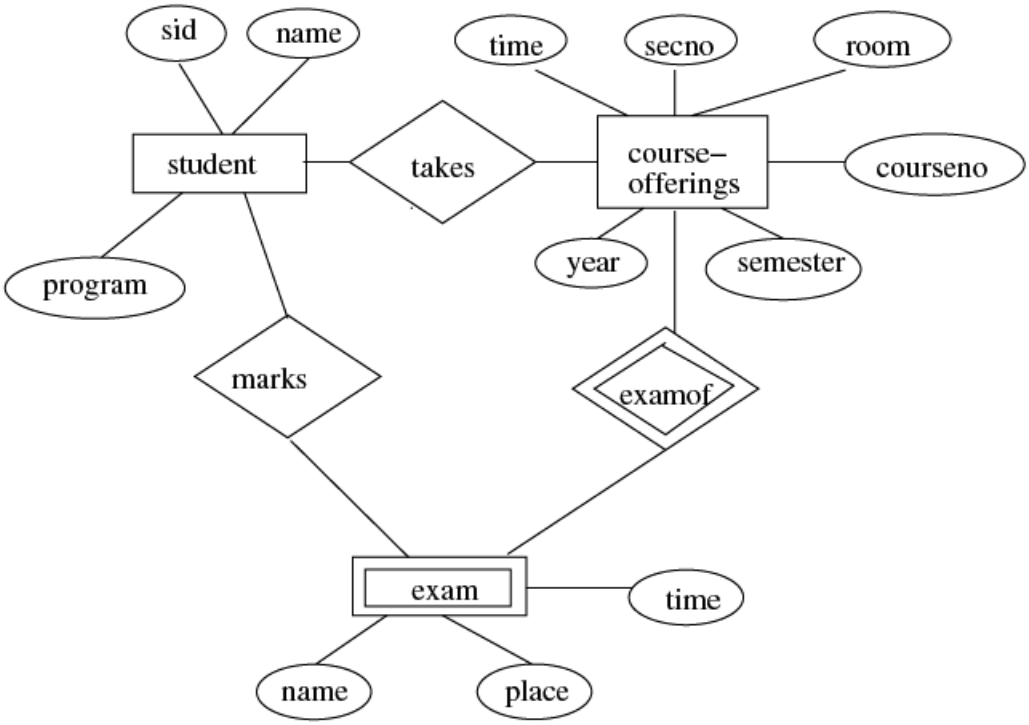


4) Consider a database used to record the marks that students get in different exams of different course offerings.

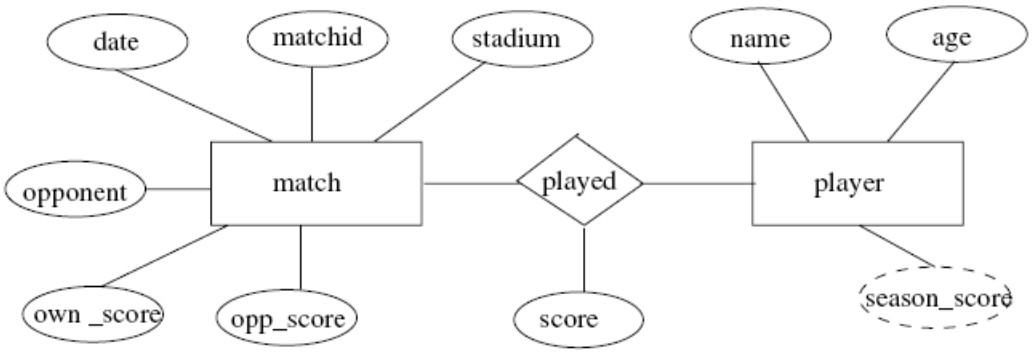
a. Construct an E-R diagram that models exams as entities, and uses a ternary relationship, for the above database.



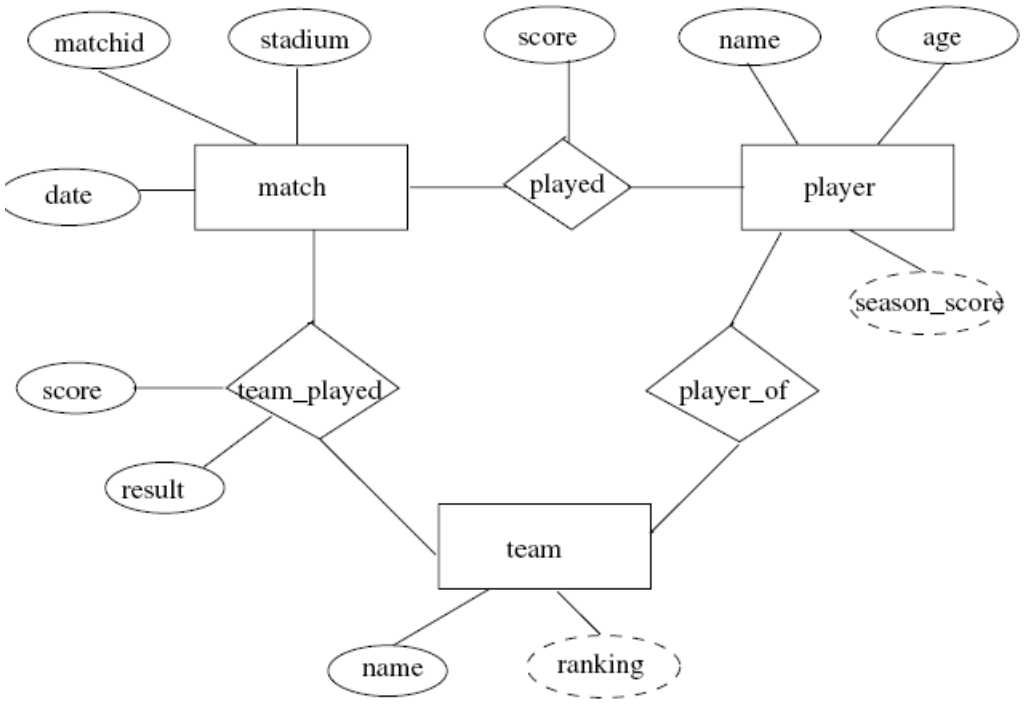
b. Construct an alternative E-R diagram that uses only a binary relationship between students and course-offerings. Make sure that only one relationship exists between a particular student and course-offering pair, yet you can represent the marks that a student gets in different exams of a course offering.



5) Design an E-R diagram for keeping track of the exploits of your favourite sports team. You should store the matches played, the scores in each match, the players in each match and individual player statistics for each match. Summary statistics should be modeled as derived attributes



6) Extend the E-R diagram of the previous question to track the same information for all teams in a league.



7) Consider a university database for the scheduling of classrooms for final exams. This database could be modeled as the single entity set *exam*, with attributes *course-name*, *section-number*, *room-number*, and *time*. Alternatively, one or more additional entity sets could be defined, along with relationship sets to replace some of the attributes of the *exam* entity set, as

- **a.** *course* with attributes *name*, *department*, and *c-number*
- **b.** *section* with attributes *s-number* and *enrollment*, and dependent as a weak entity set on *course*
- **c.** *room* with attributes *r-number*, *capacity*, and *building*

Show an E-R diagram illustrating the use of all three additional entity sets listed.