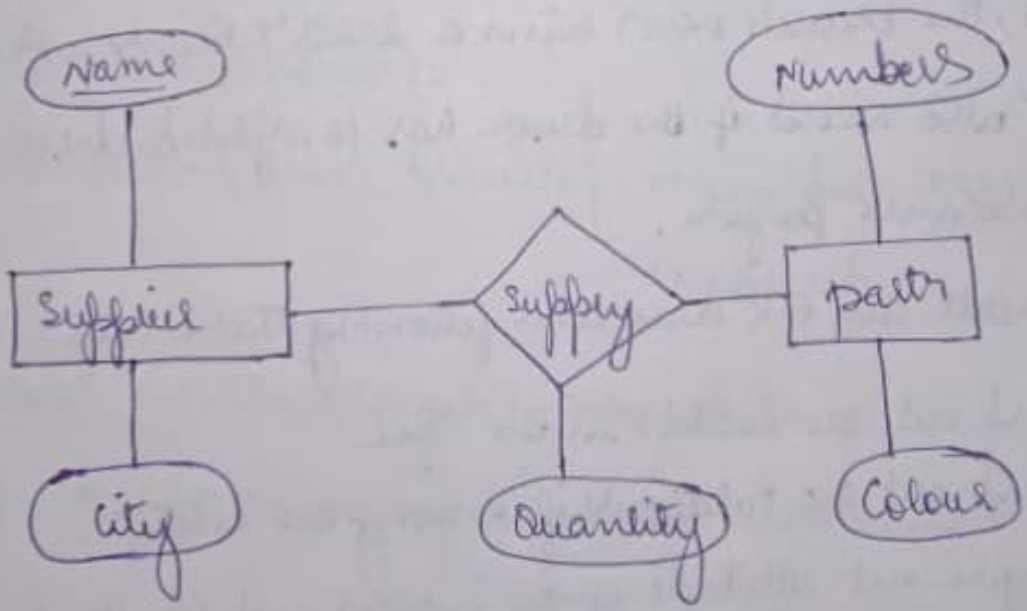
Q.1 Draw ER diagram for the following application from the manufacturing industry.

1. Each supplier has a unique name.
2. More than one supplier can be located in same city.
3. Each part has a unique part number.
4. Each part has a colour.
5. A supplier can supply more than one part.
6. A part can be supplied by more than one supplier.
7. A supplier can supply a fixed quantity of each part.

Soln.



Q2. The Motor vehicles Branch Administers driving tests and issues driver's licenses. Any person who wants a driver's license must first take a learner's exam at any Motor vehicle Branch in the province. If he/she fails the exam, he can take the exam again any time after a week of the failed exam date, at any branch. If he passes the exam, he is issued a license (type-learner's) with a unique license number. A learner's license may contain a single restriction on it. The person may take his driver's exam at any branch any time before the learner's license expire date (which is usually set at six months after the license issue date). If he passes the exam, the branch issues him a driver's license. A driver's license must also record if the driver has completed 'driver's education' for insurance purpose.

Create an E-R diagram following these steps:

1. Find out the entities in the spec
2. Find out the relationship among the entities.
3. Figure out attribute of the entities and (if any) of the relationship.
4. Figure out constraints between entities and relationships.
5. Check if see if you don't miss anything in spec.

Sol^n

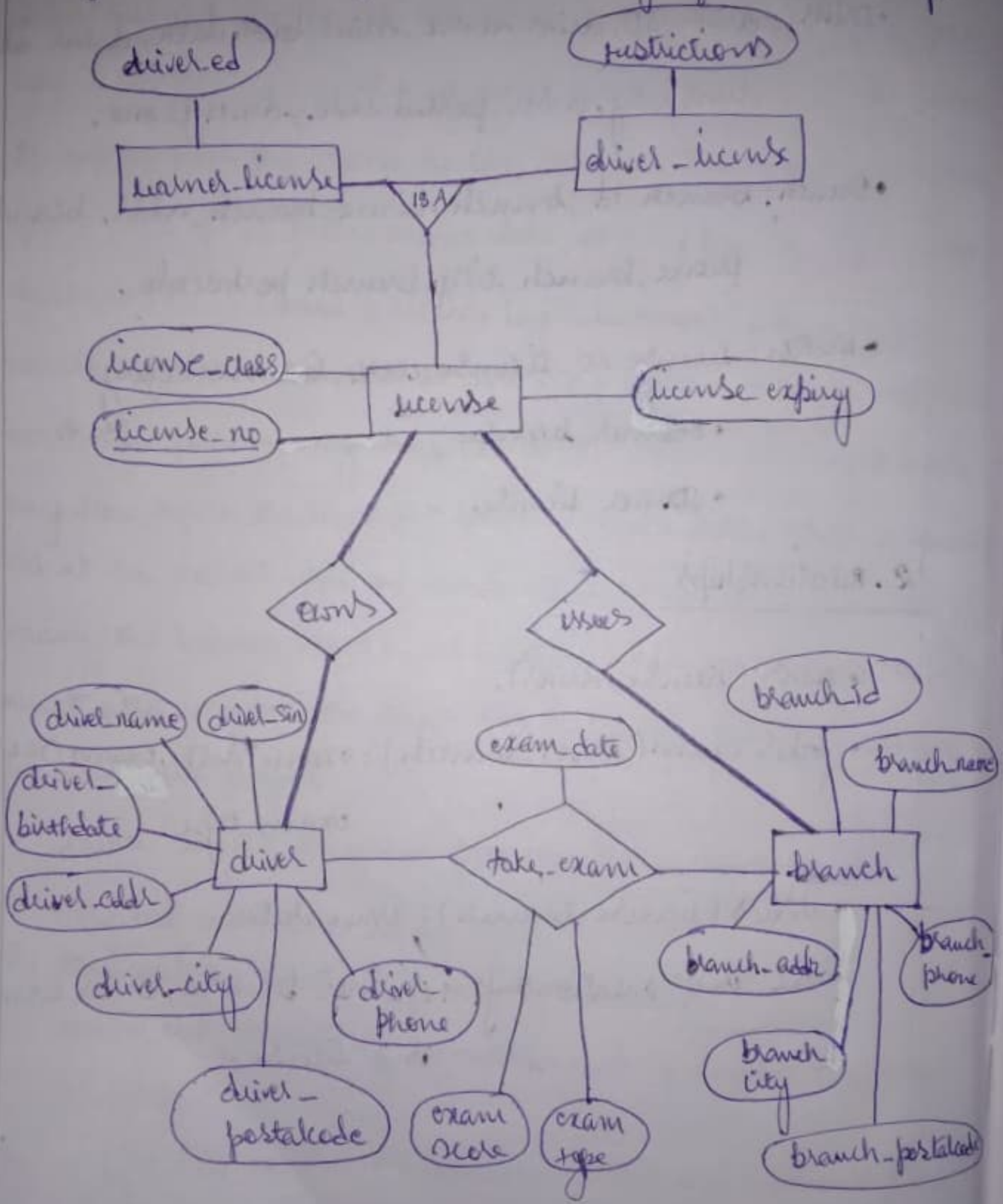
1. Entities

- Driver : driver ID, driver name, driver birth data, driver addr, driver city, driver postal code, driver phone.
- Branch: branch id, branch name, branch addr, branch phone, branch city, branch postalcode.
- License: license no, license class, license expiry.
  - Learner license
  - Driver license.

2. Relationships

- owns (license, driver).
- takes exam (driver, branch) : exam date, exam score, exam type.
- issues (license, branch) : issue data.
- The "is a" relationship : Learner License, Driver license "is a" license.

3. Figure out attributes of entities and (if any) of the relationships.



4. Constraints:

1. a [driver] must <own> (at least one) [license].
2. a [driver] must <take> at least one exam.
3. a [license] must be <owned> by one and only one [driver].
4. a [license] must be <issued> by one and only one [branch].
5. a [branch] must <issue> at least one license.

Q3. A university registrar's office maintains data about the following entities:

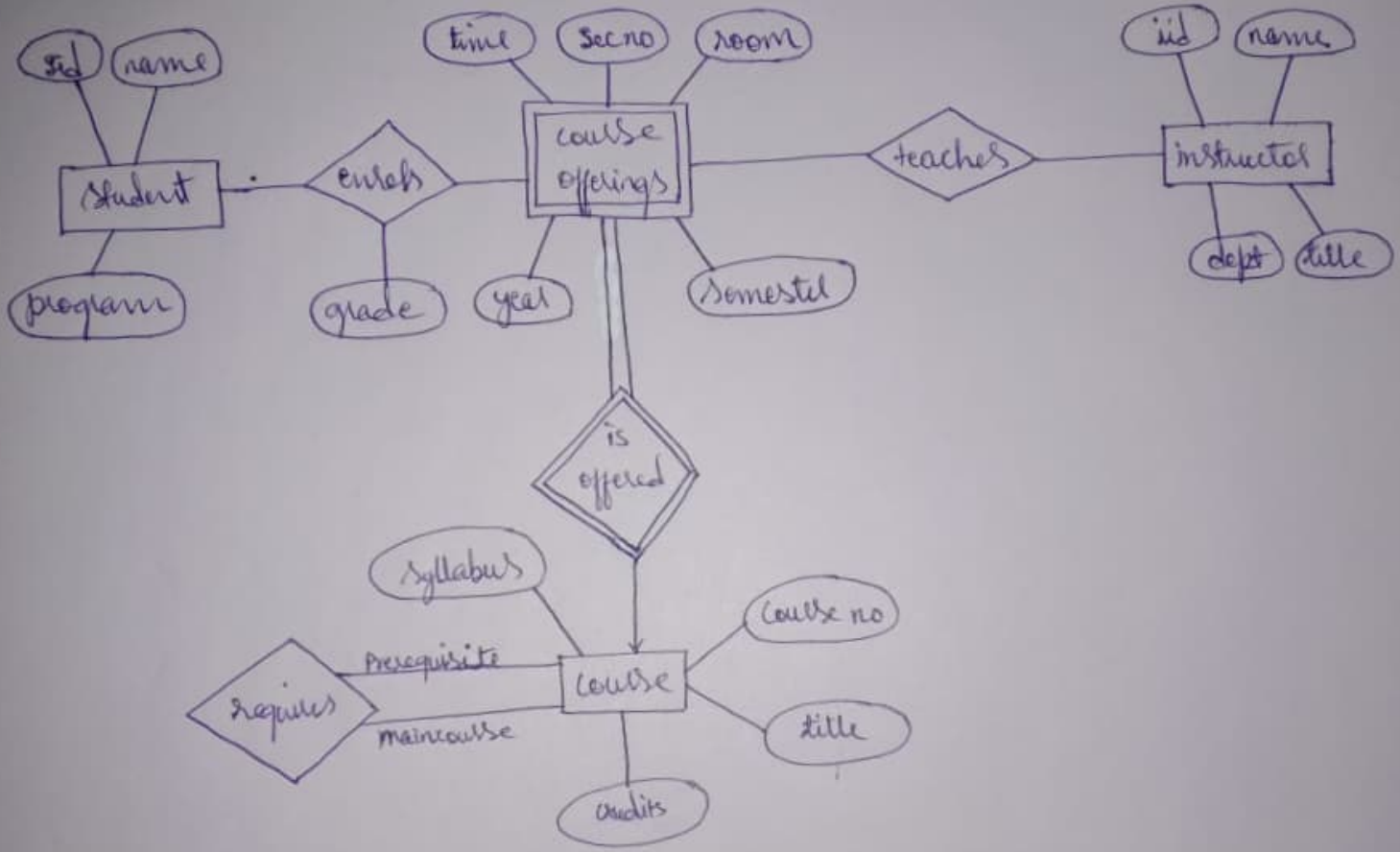
a) course, including number, title, credits, syllabus, and pre-requisites.

b) course offerings, including course number, year, semester, section number, instructor(s), timings, and classroom.

c) Students, including student-id, name, and program.

d) Instructors, including identification number, name, department, and title. Futher, the enrollment of students in courses and grades awarded to students in each course they are enrolled for must be appropriately modeled.

Construct an ER diagram for the registrar's office. Document all assumptions that you make about the mapping constraints.



ER diagram for a university.