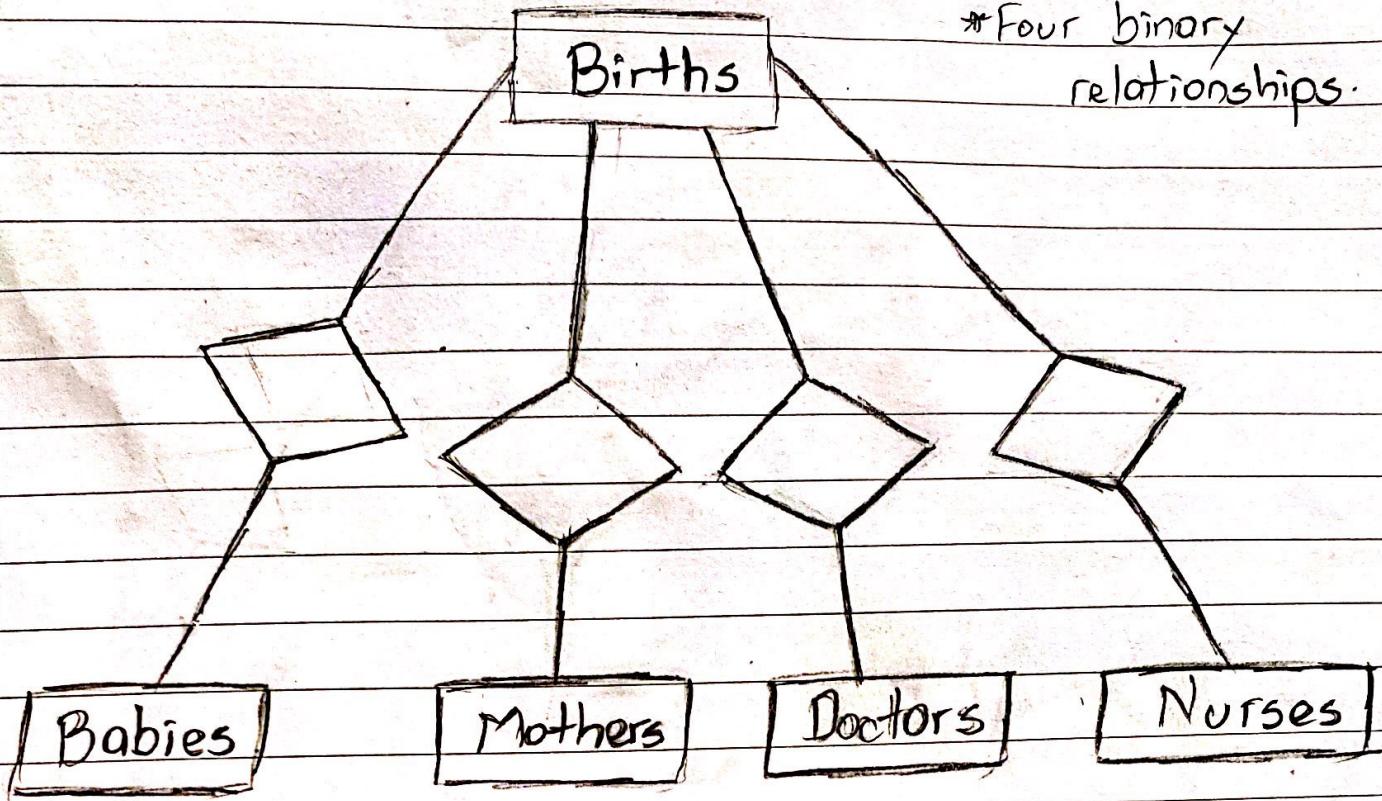
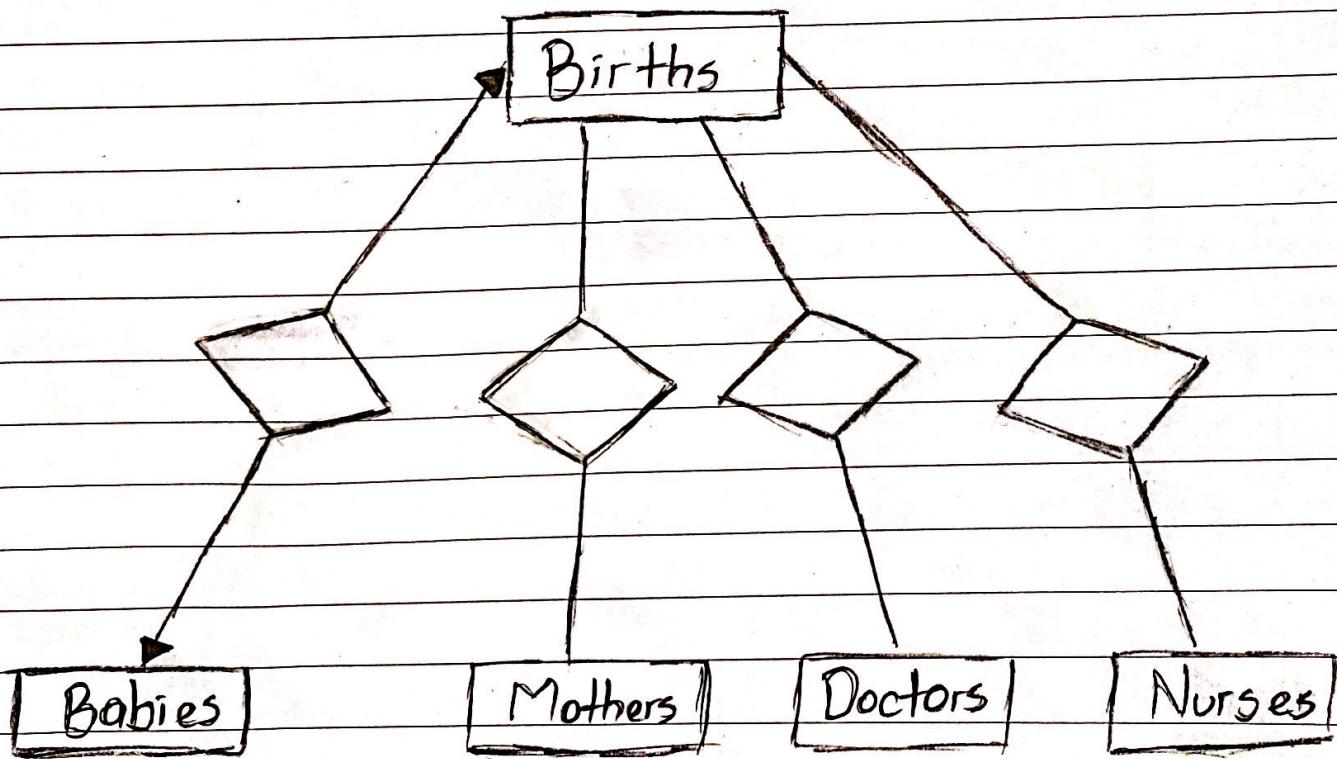


Task 2 page 1.



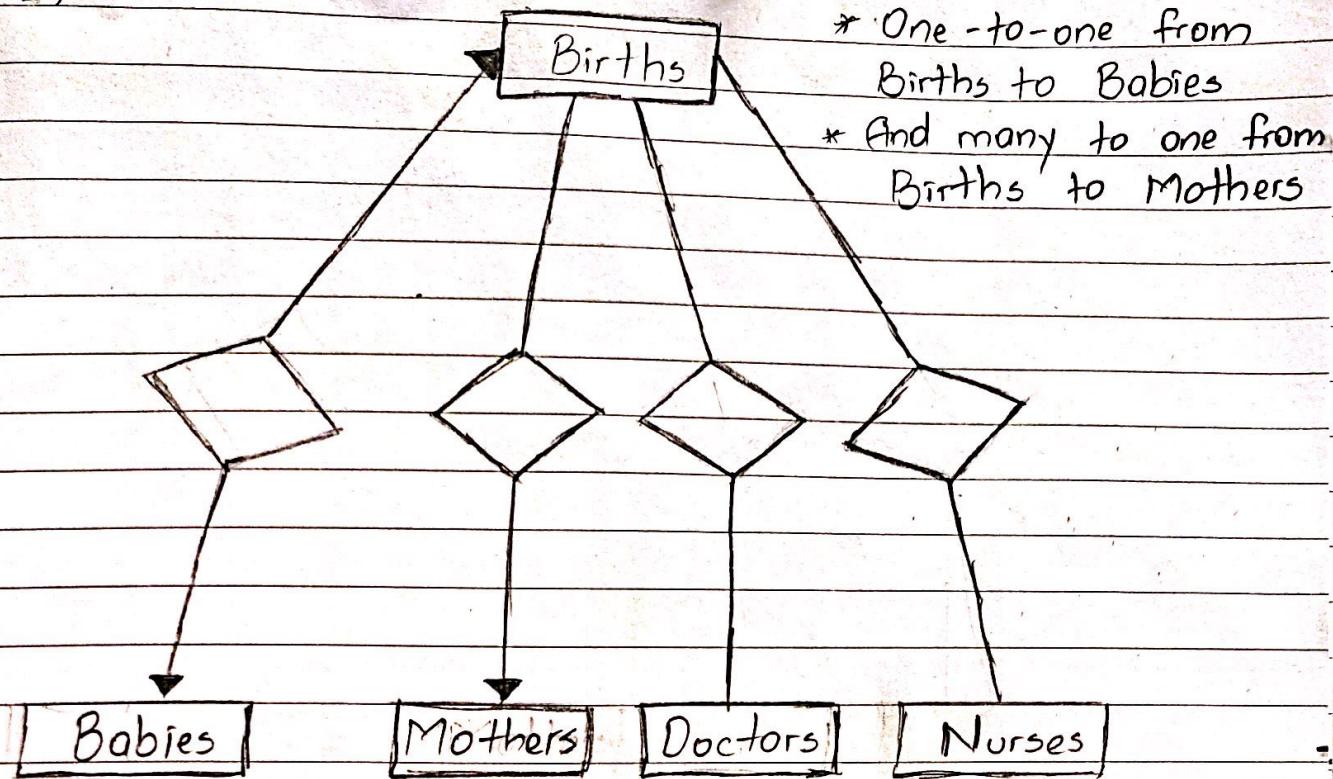
1)



- *One-to-one relationship between Births and Babies.
- *The expected relationship is to result a baby for every birth

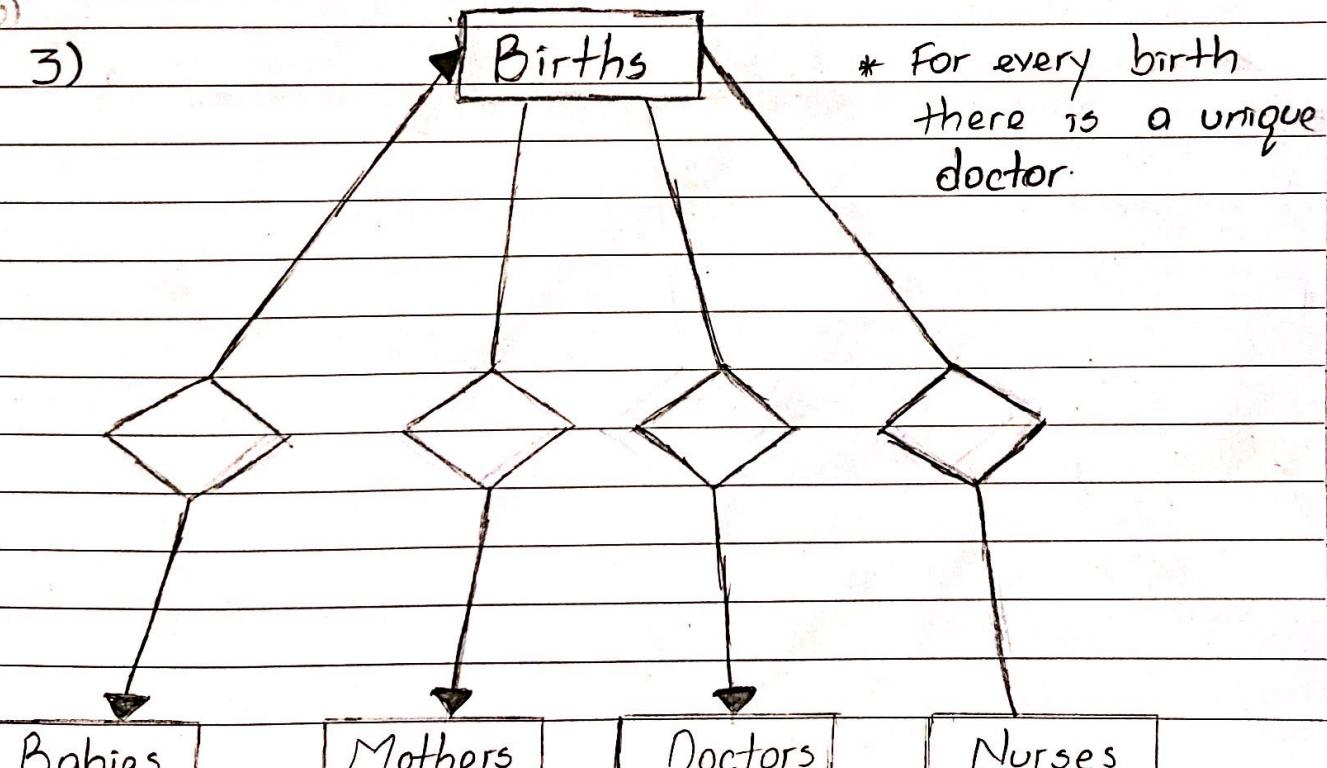
Task 2, page 2

2).



- * Every baby has a unique mother

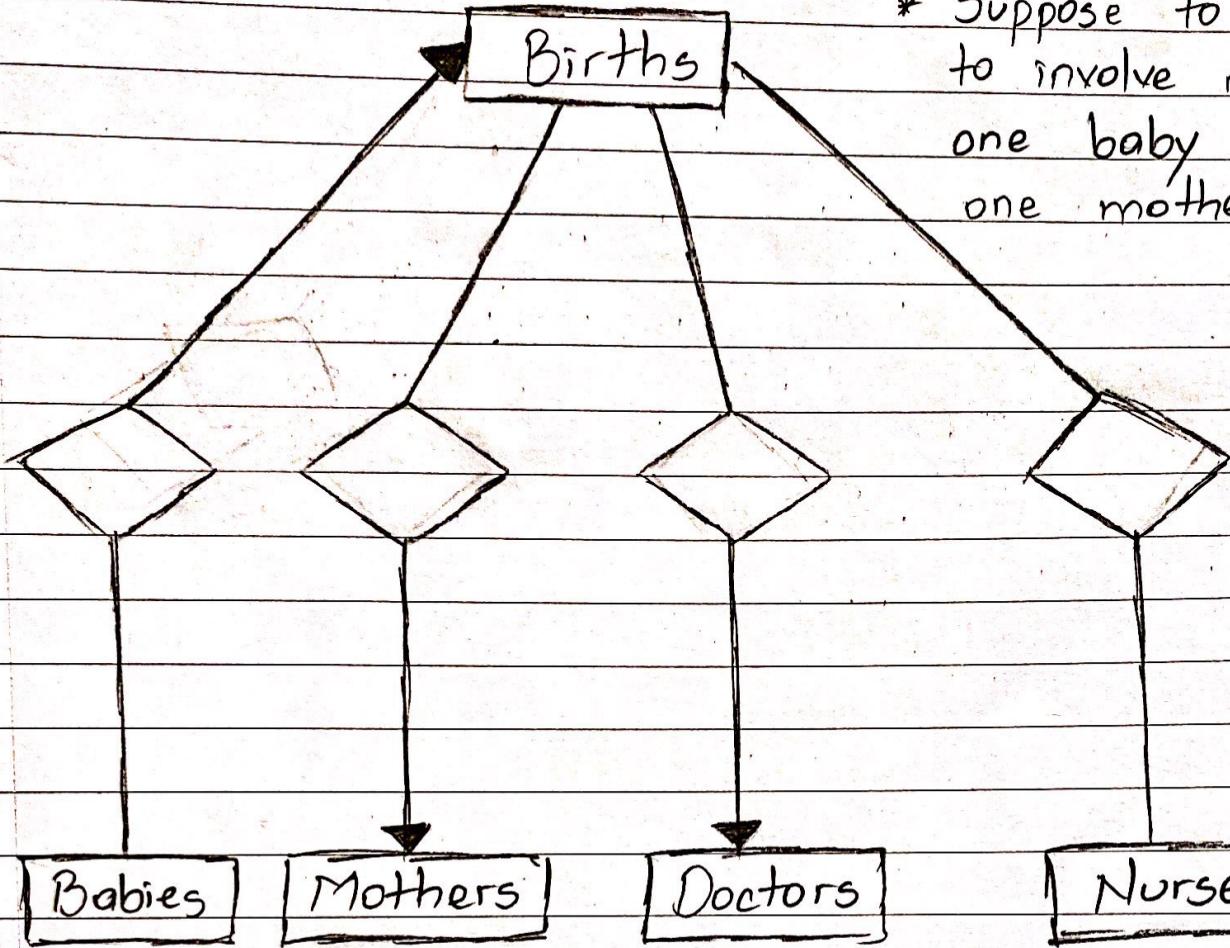
3)



- * One-to-one from Births to Babies
- * And many to one from Births to Mothers

- * One-to-one relationship from Births to Babies.
- * Many to one relationship from Births to Mothers.
- * Many to one relationship from Births to Doctors.

Task 2 page 3.



* Suppose to allow birth to involve more than one baby born to one mother.

- * One to many relationship from Births to Babies
- * Many to one relationship from Births to Mothers.
- * Many to one relationship from Births - to Doctors.

Task 5

1. $\Pi_{\text{name}} (\sigma_{\text{code} = \text{idv513}}(\text{student} \bowtie \text{enrolledIn}))$

2. $\Pi_{\text{name}} (\sigma_{\text{code} = \text{idv513}}(\text{student} \bowtie \text{enrolledIn})) \cap (\Pi_{\text{name}} (\sigma_{\text{code} = \text{idv513}}(\text{student} \bowtie \text{enrolledIn})))$

3. $\Pi_{\text{lecturer}} (\sigma_{\text{code} = \text{idv610}}(\text{subject}))$

4. $\Pi_{\text{lecturer}} (\sigma_{\text{code} = \text{idv513} \text{ AND code} = \text{idv513}}(\text{subject}))$

5. $\Pi_{\text{name}} (\sigma_{\text{lecturer} < > \text{idr}}(\text{student} \bowtie \text{enrolledIn} \bowtie \text{subject}))$

Task 6 , page 1.

1. Find functional dependencies?

1. Applicant, day \rightarrow Manager, time, room

- When an applicant is going to be interviewed, there will be a fixed manager, time and room.

2. Day, Time, Room \rightarrow Manager, Applicant

- For an interview with one applicant, the room will be booked for a fixed time by that manager.

3. Manager, Day \rightarrow Room

- The managers use the same room to interview applicants the whole day.

4. Manager, Day, Time \rightarrow Applicant, Room

- Only one interview at a time

2. Find the keys of the relation?

a. (Applicant, day) and

b. (Day, Time, Room)

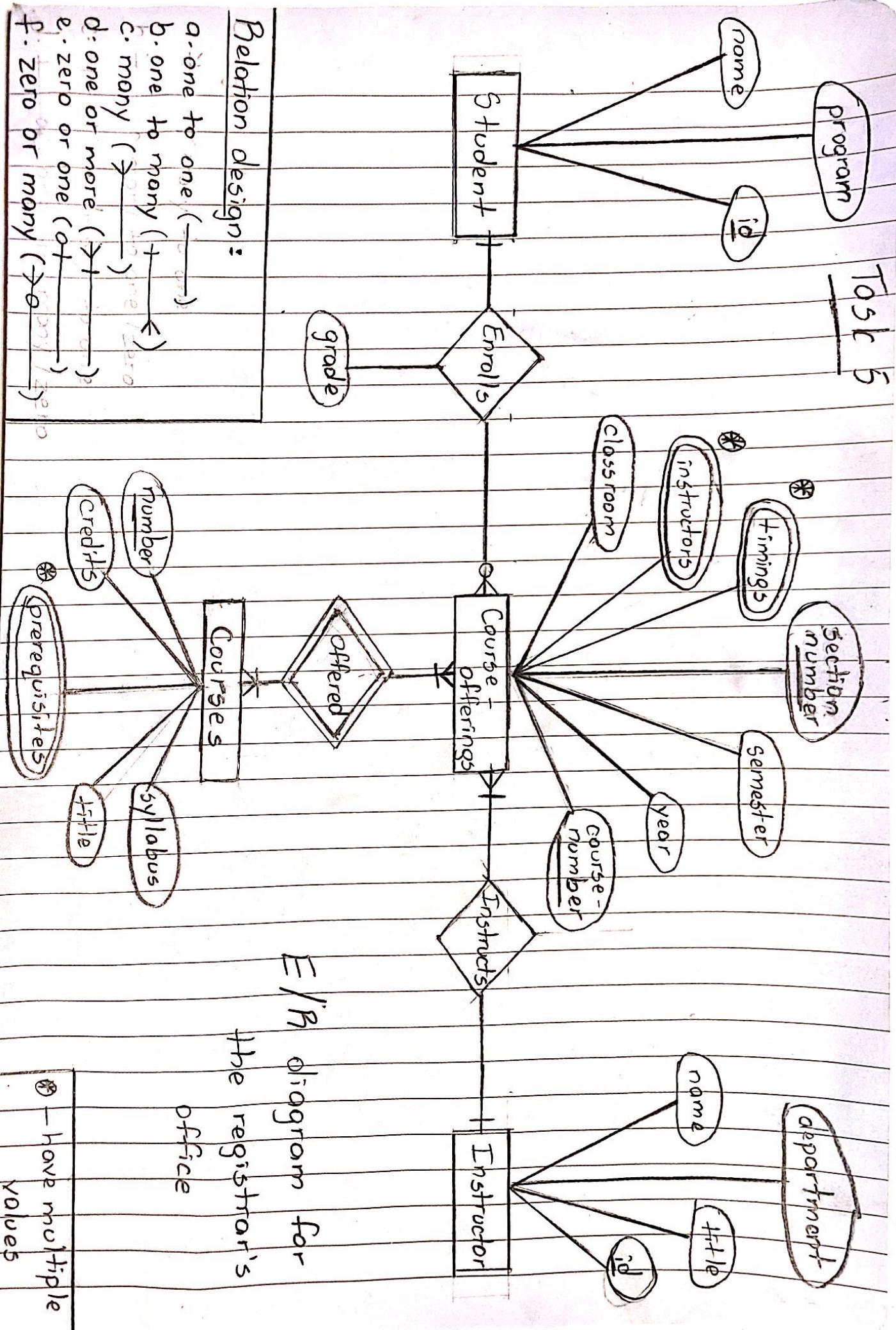
3. Show that the relation is in 3NF but not in BCNF?

* A relation R is in 3NF if: Whenever $X \rightarrow A$ is a non trivial functional dependency, either X is a super key or A is a member of some key (= prime).

* The relation is not in BCNF because of the left hand side of the third functional dependency

(Manager, Day) is not a superkey. But the relation is in 3NF because of the right side of the third functional dependency (room) is one of the keys.

Task 5

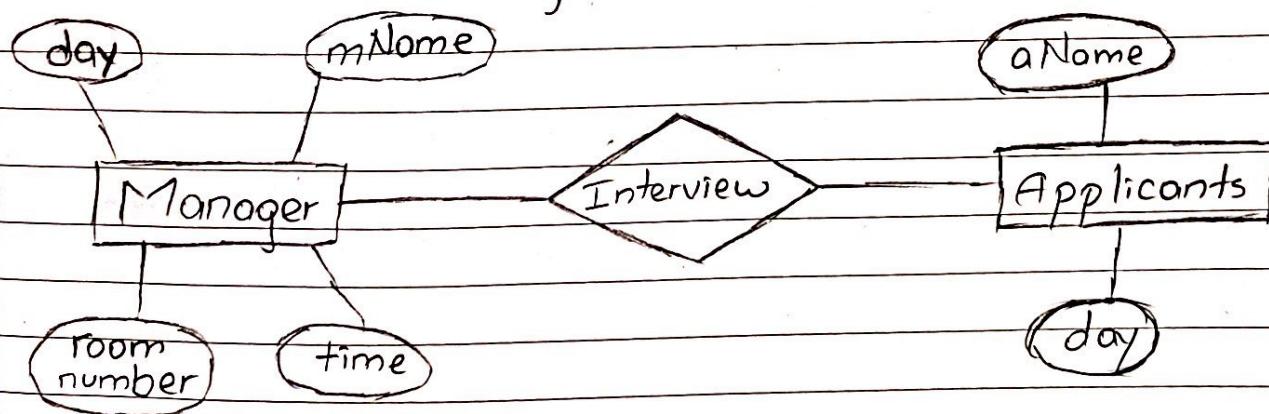


Task 6, page 2

4. Decompose the relation in relations that are in BCNF?

- * To change a relation in 3NF to BCNF. First, we can take one of the functional dependency (which is the third functional dependency in this case) that contravenes the BCNF rule.
- * New relation from the attributes that are in the third functional dependency.
 - (manager, day, room)
- * Another new relation from the third functional dependency (all attributes except those on right sides)
 - (manager, day, time, applicant)
- * So, the two relations are in BCNF
Relation 1 - (manager, day, room)
Relation 2 - (manager, day, time, applicant)

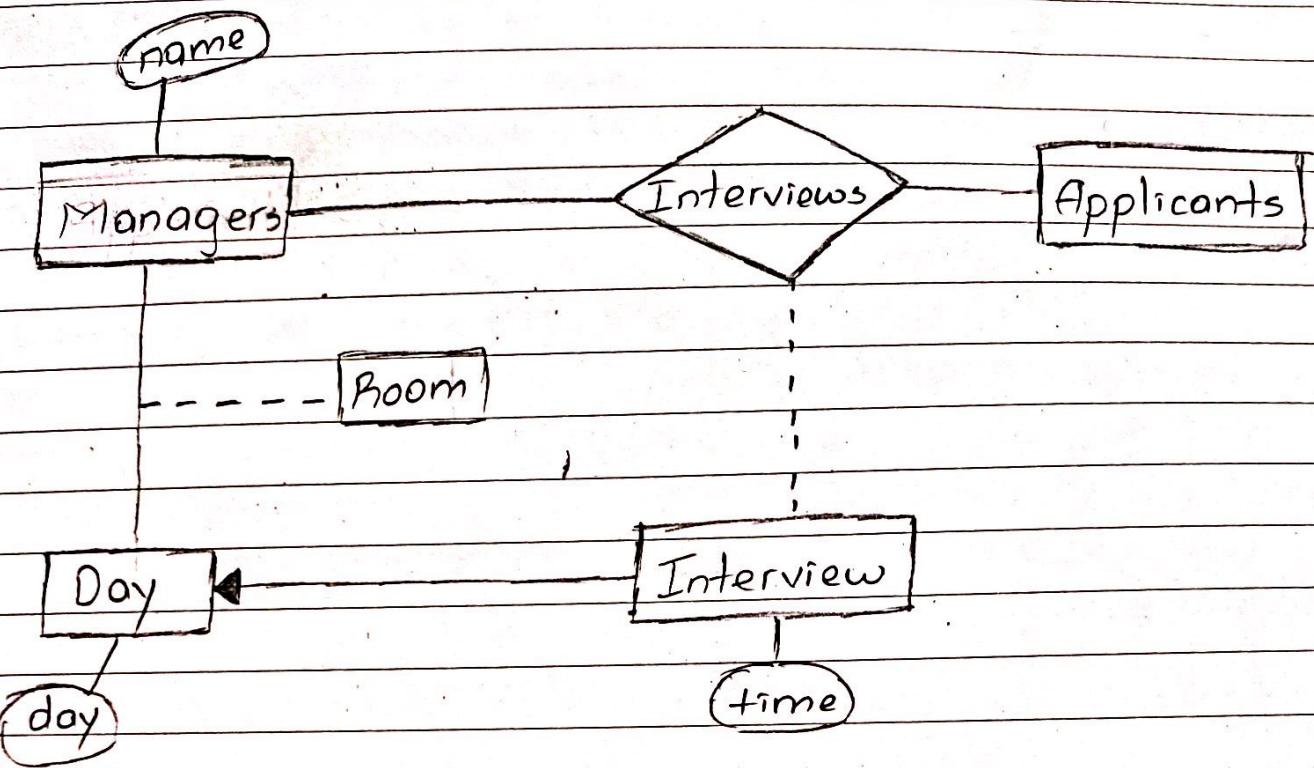
5. Draw an E/R diagram



* In this diagram, interview is the relation between manager and applicant.

Task 6 , page 3

5.



- * This E/R diagram shows the functional dependencies.
- * Day and room are also considered as entity sets.