

# Module - Database Technologies

## Assignment - 1

Roll no- 220950320034

Name- Dhananjay Sahu

Q. A university DB contains information about professors (identified by SIN) and courses (identified by course ID). Professors teach courses; each of the following situations concerns the Teaches relationship set.

List all candidate keys of the Teaches relationship set.

a. Professors can teach the same course in several semesters, and each offering must be recorded.

Ans) Entity sets

- professor: SIN as primary key,
- course: CID as primary key,
- semester: SID as primary key.

Relationship set

- teaches : associates professor, course and semester.

No other attributes. The cardinality constraint is m-to-m.

There is a single candidate key of the teaches relationship: {SIN, CID, SID}.

The participation constraint can be anything; let say that it is total on professor and course entity sets

b. Professors can teach the same course in several semesters, but only the most recent such offering needs to be records. Assume the above Situation (b) applies in all subsequent situations.

Ans) Semester does not need to be an entity set here. Teaches is a binary relation between professor and course. Semester is attribute of teaches. The key of teaches is {SIN, CID}.

List all the keys possible in each of the following situations.

a. Every professor teaches a course, and every course is taught by some professor.

Ans) This means total participation from professors and total participation from courses. Because it is still m-to-m, the candidate key remains {SIN, CID}

b. Every professor teaches exactly one course, and every course is taught by exactly one professor.

Ans) This time the relationship is 1-to-1. There are now two candidate keys:  
either {SIN} or {CID}.