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Section - DS1

Roll No - 62

Subject - DBMS

Assignment 1

Ques. 1.

- (a). Entity Identification :-
- 1) faculty
 - 2) School
 - 3) program
 - 4) Courses
 - 5) Lectures
 - 6) Students
 - 7) University

(b). Attribute Specification :-

- 1) faculty :- faculty-ID, Name, faculty-Head
- 2) School :- School-ID, Name, faculty-ID (FK)
- 3) Program :- Program-ID, Name, Duration, School-ID (FK)
- 4) Courses :- Course-ID, Title, Credits, Program-ID (FK)
- 5) Lectures :- Lecturer-ID, Name, Qualification, Department
- 6) Student :- Student-ID (PK), Name, program-ID (FK).

(c). Relationship Mapping :-

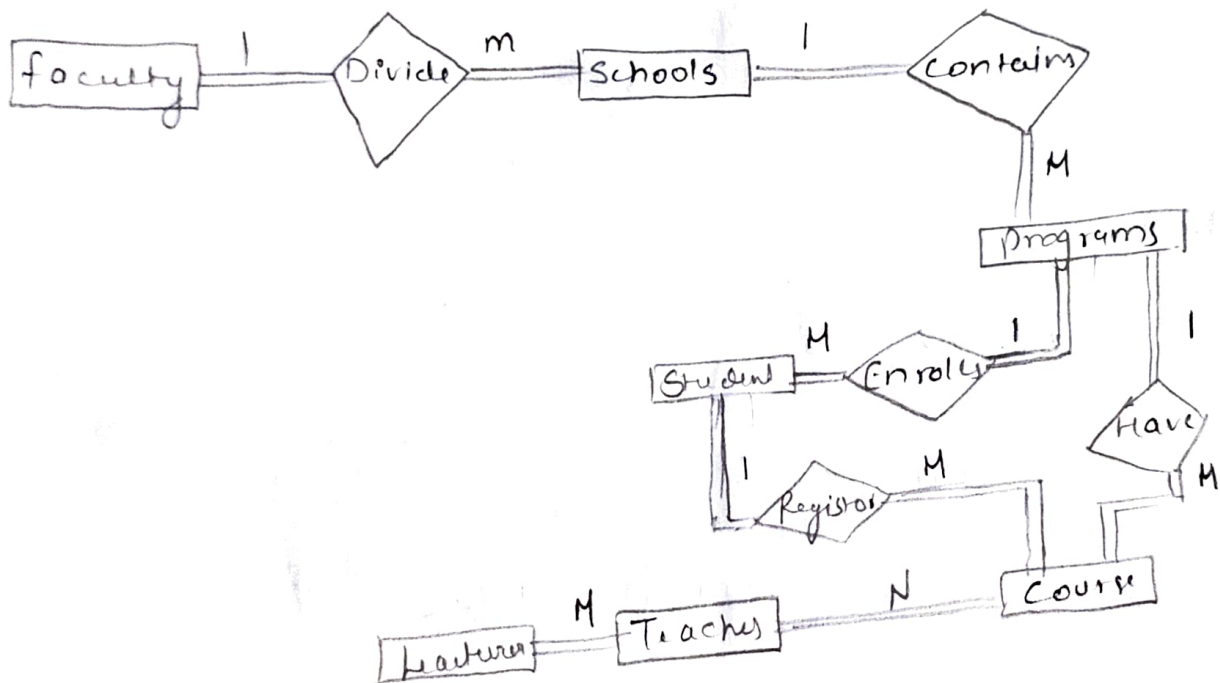
- 1) faculty \rightarrow school
 - one faculty has various schools
 - Cardinality 1:M
- 2) School \rightarrow Program
 - one school offers many programs
 - Cardinality 1:M
- 3) Program \rightarrow Course
 - one program include many courses
 - Cardinality 1:M

4) Lecturer \longleftrightarrow Course :
Cardinality : H:N

5) Student \rightarrow Program :
Cardinality : H:1

6) Student \longleftrightarrow Course
Cardinality H:N

d) Er Diagram



Q.2:

A weak entity type is an entity that cannot be uniquely identified by its own attributes alone.

It depends on a strong entity (owner entity) for its identification.

It usually has a partial key (discriminator) that, together with the primary key of the strong entity, uniquely identifies its instances.

Difference:

Strong Entity: Has its own primary key.

Weak Entity: Needs strong entity's key + own partial key to be identified.

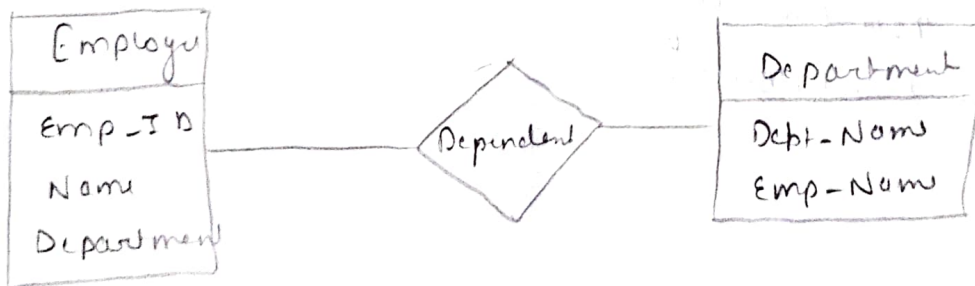
Example:

Employee (Strong Entity) → uniquely identified by Employee-ID.

Dependent (Weak Entity) → cannot be identified by name alone.

Relationship → Employee has Dependent → identifying Relationship

E-R Diagram



Ques 3:-

a) Design Issues in ER Modeling

- ① Redundancy - Same Data is stored in multiple entities
- ② Ambiguity - Confusion or interpreting entities, attributes or relationships
- ③ Over Generalization / under generalization
 - Over Generalization - combining too many frequently entities into 1
 - Under generalization - creating too many separate entities, when attributes could be merged
 - Missing attributes/keys
foreign / primary key as attributes.

b) Refinement Techniques

① Normalization:-

Remove redundancy by breaking entities into smaller, meaningful entities

② Categorify Relationships:-

Use correct cardinalities

③ Specialization / Generalization

Use ISA hierarchy when some entities share common attributes.