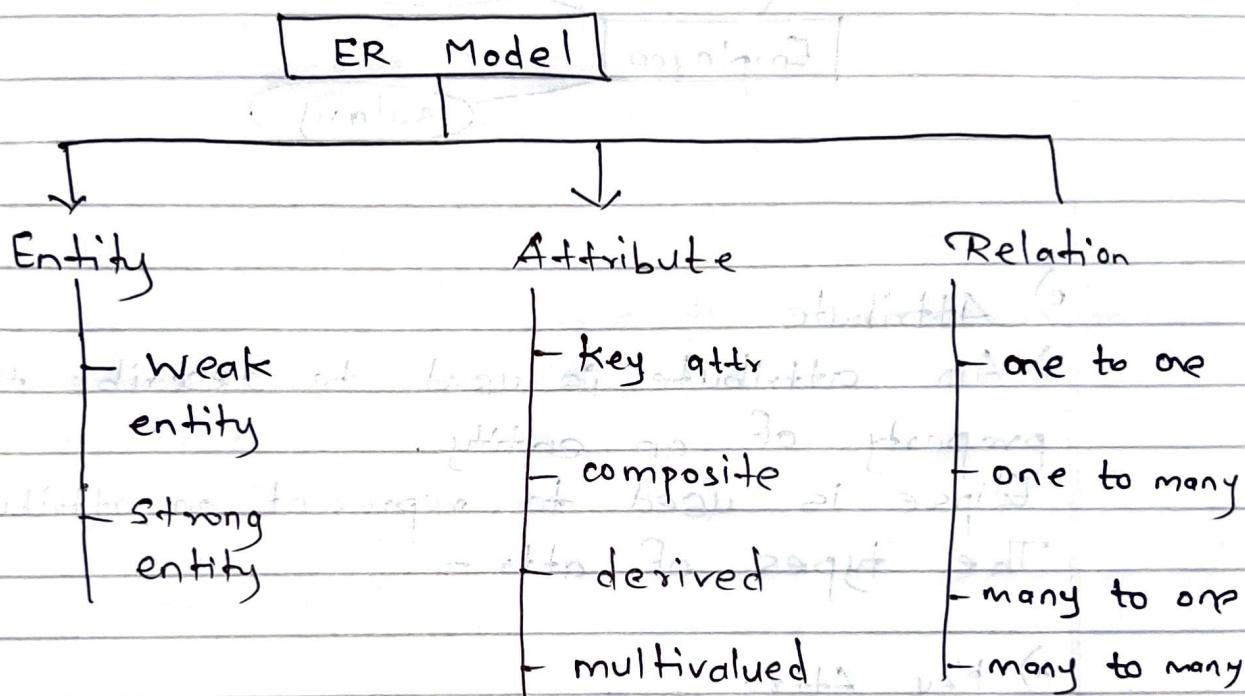


Explain components of ER with diagrams.

- ER stands for Entity-relationship model.  
This model is used to define the data elements and relationship for a specified system.
- Components of ER Diagram -



### 1) Entity

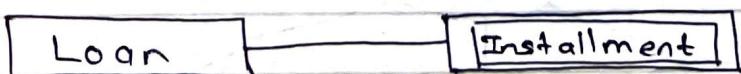
⇒ An entity may be any object, class, person or place. In ER diagram, an entity can be represented as rectangle.

The types of entities are -

#### a) Weak Entity

⇒ An entity that depends on another entity is called as weak entity.

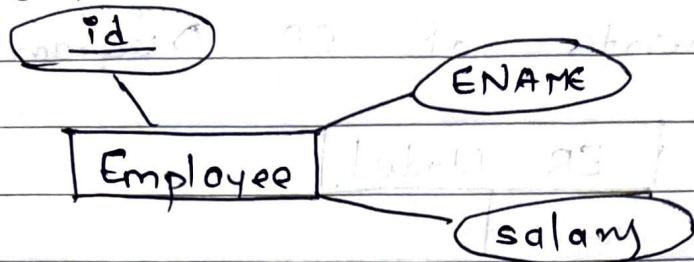
For e.g.,



b) Strong Entity

⇒ Entity type which has its own key attr. by which we can uniquely identify specific entity is called as strong entity.

For e.g.,



c) Attribute

⇒ An attribute is used to describe the property of an entity.

Ellipse is used to represent an attribute.

The types of attr -

a) Key Attr.

⇒ It can uniquely identify an entity from entity set.

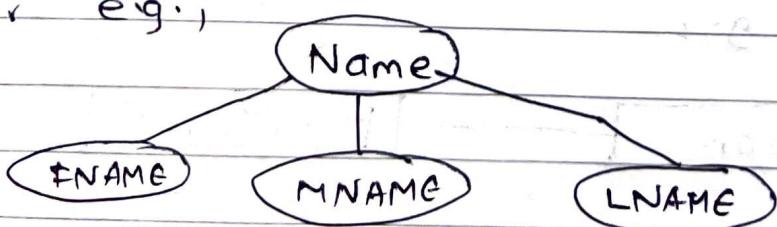
For e.g.,



b) Composite Attr

⇒ An attribute which can be divided in multiple sub-parts.

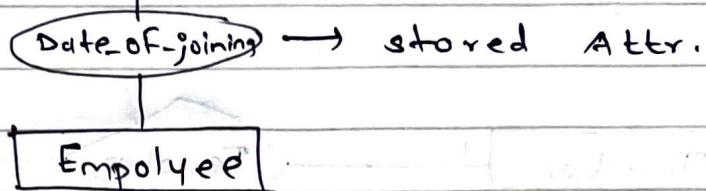
For e.g.,



### c) Derived Attr.

⇒ An attr. which can be derived from other attr. is called as derived attr.

(Tenure) → derived attr.



### d) Multivalued Attr.

⇒ An attr. having more than one value for some entity is called a multivalued attr.

For e.g.,



### 3) Relationship

⇒ A relationship is used to describe the relation b/w entities.

Diamond or rhombus is used to represent the relationship.

#### a) One to one

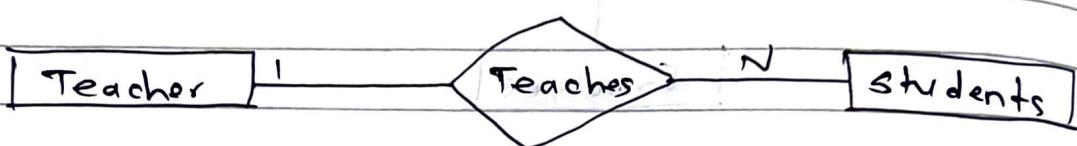
⇒ When only one instance of an entity is associated with the relationship, it is known as one to one.

For e.g.,



b) One to many

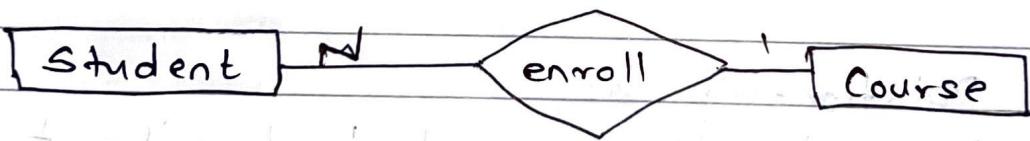
⇒ When only one instance of the entity on the left, and more than one instance on the right associates with relationship, then this is known as one-to-many relationship.  
For e.g.,



c) Many to one

⇒ When more than one instance of entity on the left, and only one instance of entity on the right, then this is known as many to one.

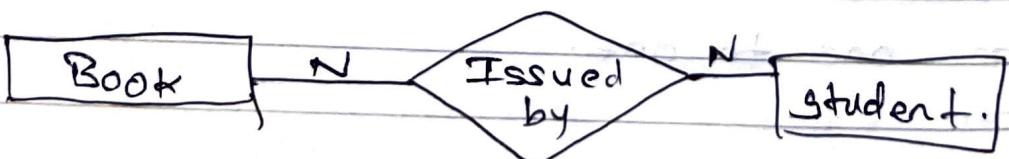
For e.g.,



d) Many to many

⇒ When more than one instance of an entity on both left and right associates with relationship, then this is known as many to many.

For e.g.,



Explain relationship, relationship set and cardinality.

- Relationship

⇒ A relationship is an association among one or more than one entities.

Diamond shape is used to represent relationship for e.g.,



- Relationship sets

⇒ Collection of all relationship of same type is relationship set.

The many employees are working for different departments so it is relationship set of works-for relationship.

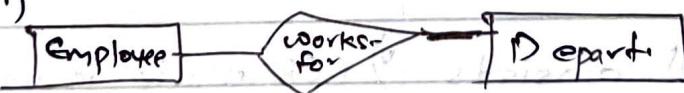
- Degree of Relationship

⇒

- 1) Unary ⇒ A relationship of degree one

- 2) Binary ⇒ A relationship of degree two

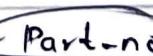
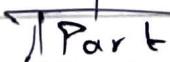
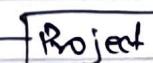
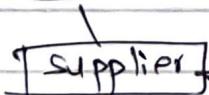
Eg:-



- 3) Ternary ⇒ A relationship of degree three

Name

quality



## Q.17 Compare ER and EER

ER	EER
i) ER model stands for entity-relationship model.	ii) EER stands for extended entity-relationship model.
ii) ER diagram is a visual representation of a data based ER model, and it describes how entities are related to each other in the DB.	ii) EER diagram is a visual representation of data, based on EER model that is an extension of the original ER model.
iii) In ER schema the resulting schema diagrams are called ER diagram.	iii) In EER schema the resulting schema diagrams are called EER diagrams.
iv) The concept of specialization and generalization is absent.	iv) It includes the concept of specialization and generalization.
v) ER model consists of set of entities and relationship among these entities.	v) EER model is used to represent a collection of objects i.e., Union of objects of different entity types.

- Q.2 Explain Extended ER Features.
- ⇒ i) EER model includes all the modeling concept of ER model.
- ii) In addition it also includes the concept of aggregation, specialization and generalization.

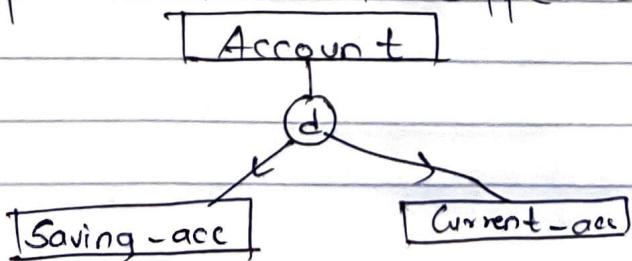
### EER Feature

- 1) Specialization
- 2) Generalization
- 3) Aggregation.

#### 1) Specialization

⇒ Specialization is a process of defining a set of subclass of entity type, this entity type is called super class of specialization.

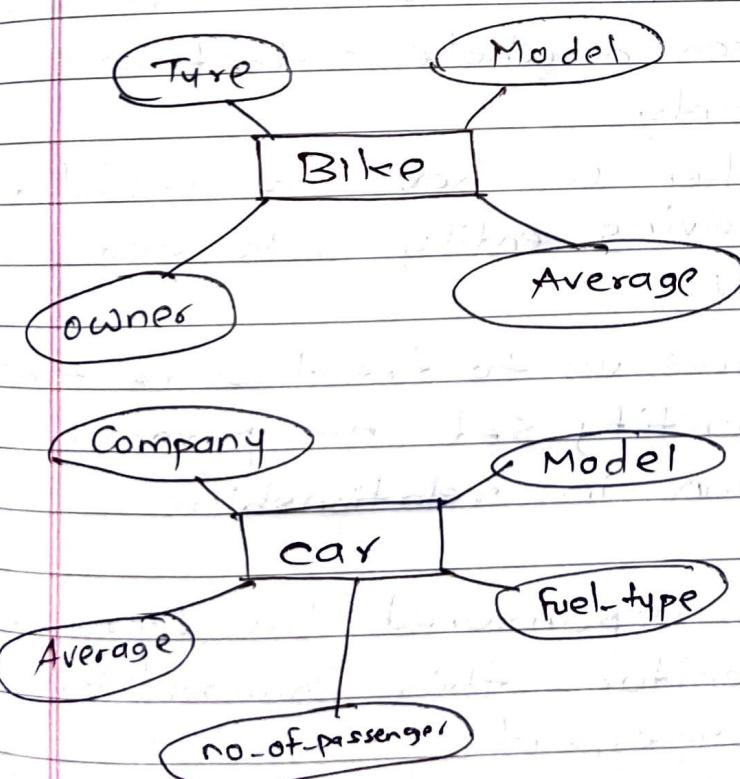
- This is the top-down approach.
- The set of subclasses that forms a specialization is defined on the basis of some distinguish characteristics of entity in Super class.
- For e.g., Set of subclass (Saving-acc, Current-acc) are specialization of super class account.

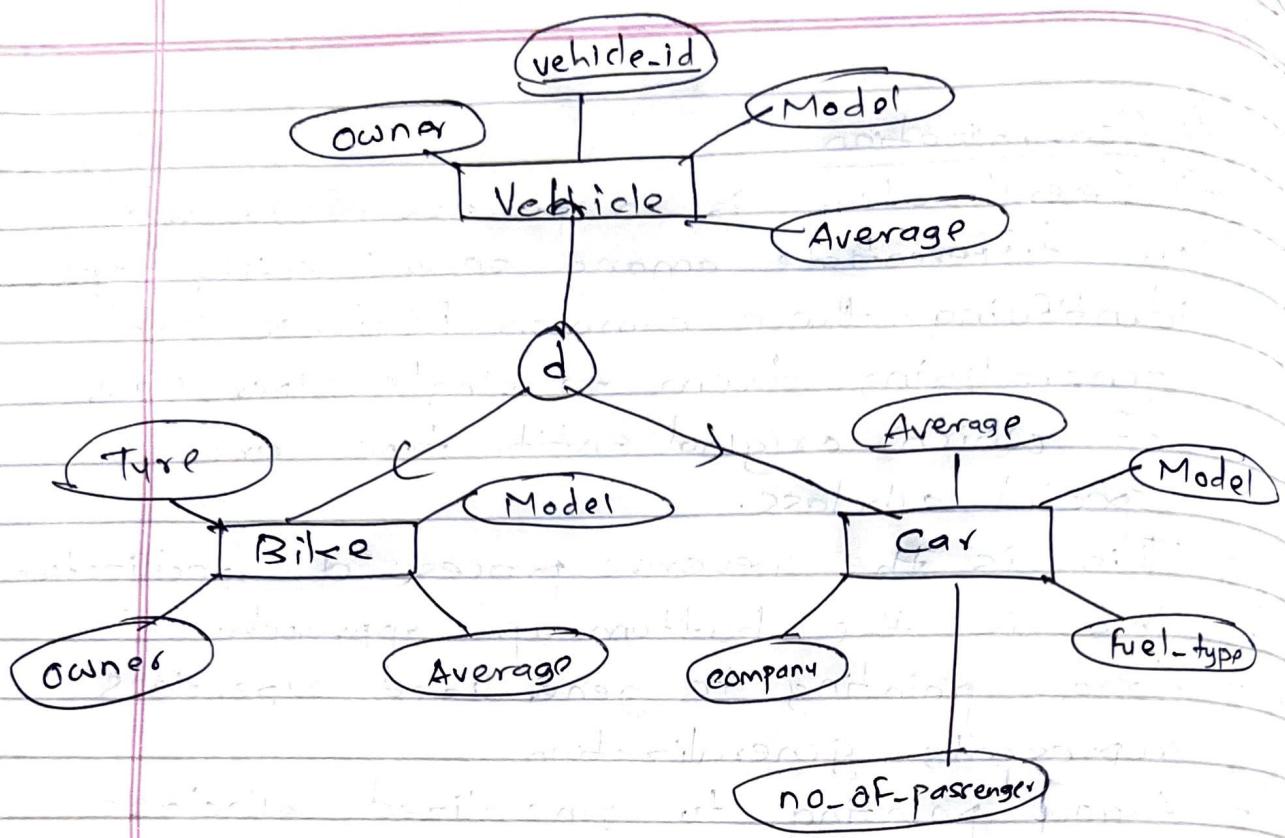


## 2) Generalization

⇒ Generalization is a process in which we differentiate among several entity types identifying their common features and generalizing them to single super class of which original entity type are special subclass.

- This is the reverse process of specialization.
- This is the bottom-up approach.
- Arrow pointing to generalized superclass represents generalization.
- Arrow pointing to generalized subclass represents specialization.
- For e.g.: Cars and bike all having several common attribute they can generalize to the super class vehicle.





### Generalized Vehicle Entity

#### 3) Aggregation

- ⇒ Aggregation is meant to represent a relationship between a whole object and its component parts.
- It is used when we have to model a relationship involving entity sets and a relationship set.
- Aggregation allows us to treat a relationship set as an entity set for purpose of participation in relationships.
- For e.g.,

A project is sponsored by department.  
 An employee monitors this sponsorship.  
 This is aggregation.

