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**BS (SE)**

Semester # **4<sup>th</sup>**

Section# **“B”**

Subject# **Database  
System(Theory)**

Instructor# **Rimsha Khan**

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## Question No 1:

### Answer No 1:

**Candidate Key:** In the relational model of databases, a candidate key of a relation is a minimal super key for that relation; that is, a set of attributes such that: the relation does not have two distinct tuples with the same values for these attributes there is no proper subset of these attributes for which holds.

## Properties of candidate Key:

- It must contain unique Values.
- Candidate key may have multiple attributes.
- Must not contain null values.
- It should contain minimum fields to ensure uniqueness.
- Uniquely identify each record in a table.

**Example:** In the given table student id, cell are candidate keys which help us to identify the student record in the table.

ID	Name	Semester	Department	Cell
1	Sania	1	CS	03334324234
2	Romaisa	1	CS	03335399123
3	Alina	1	CS	03150034224
4	Ayeza	3	CS	03455559822

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**Question no2:** What is Data Redundancy and Data Integrity?

**Answer no2:**

**Data Redundancy:** Data redundancy is a condition created within a **database** or **data** storage technology in which the same piece of **data** is held in two separate places. This can mean two different fields within a single **database**, or two different spots in multiple software environments or platforms.

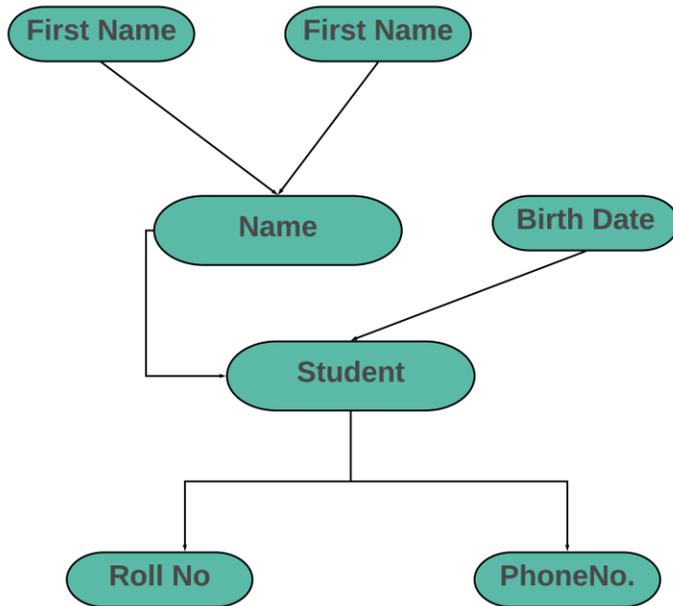
**Data Integrity:** Data integrity is the overall completeness, accuracy and **consistency** of **data**. This can

be indicated by the absence of alteration between two instances or between two updates of a **data** record, meaning **data** is intact and unchanged.

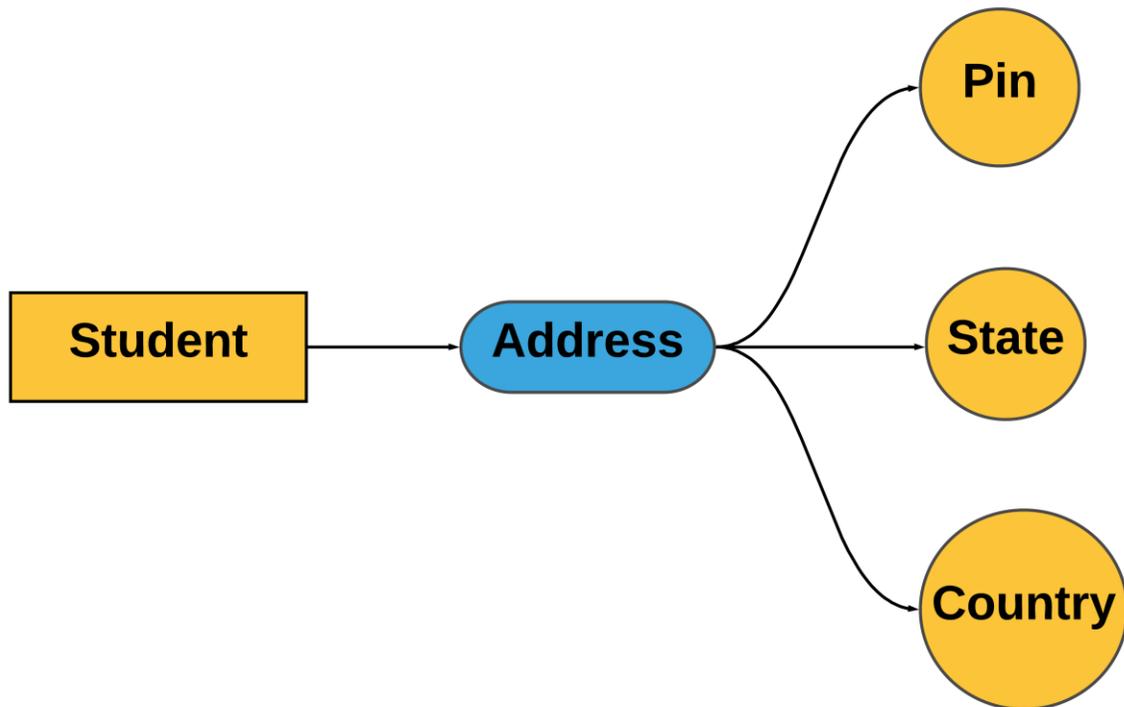
**Question no3:** How a multivalued composite attribute is represented in Conceptual Model. Show with example.

**Answer no 3:**

**Multivalued Attribute:** Multivalued **Attributes.** A **multivalued attribute** of an entity is an **attribute** that can have more than one value associated with the key of the entity. For example, a large company could have many divisions, some of them possibly in different cities.



**Composite attribute is represented in Conceptual Model:**



**Question no4:** How is there 'reduced maintenance' in database approach?

**Answer no 4:** It can cost more to maintain a mature software application in use than it did to develop it in the first place, and this is particularly the case when we are maintaining systems built on top of an RDBMS. To keep an application in use, both developers and DBAs may be forced to spend considerable time on maintenance tasks such as

- Fixing bugs and deploying the fixes

- Changing the functionality because the requirements have changed
- Cleaning up the data
- Dealing with concurrency issues; troubleshooting deadlocks, for example
- Speeding up slow queries

If the system that we develop then experiences many of these problems in production, it then also erodes both the users' confidence and the teams' morale, on top of the raw cost. When our users encounter issues or deal with inconsistent behavior of the system, it prevents them from completing their tasks effectively. When we who are tasked with maintaining the system have to fix so many problems on top of developing new features, it is bad for our work-life balance. Also, the time spent troubleshooting and fixing is the time not spent on doing other, usually more interesting and productive, work. As a result, unreliable systems may eventually lose both users and developers.

**Question no5:** How are the following represented using ER Diagram: Mandatory one, Mandatory many, Optional one, Optional Many?

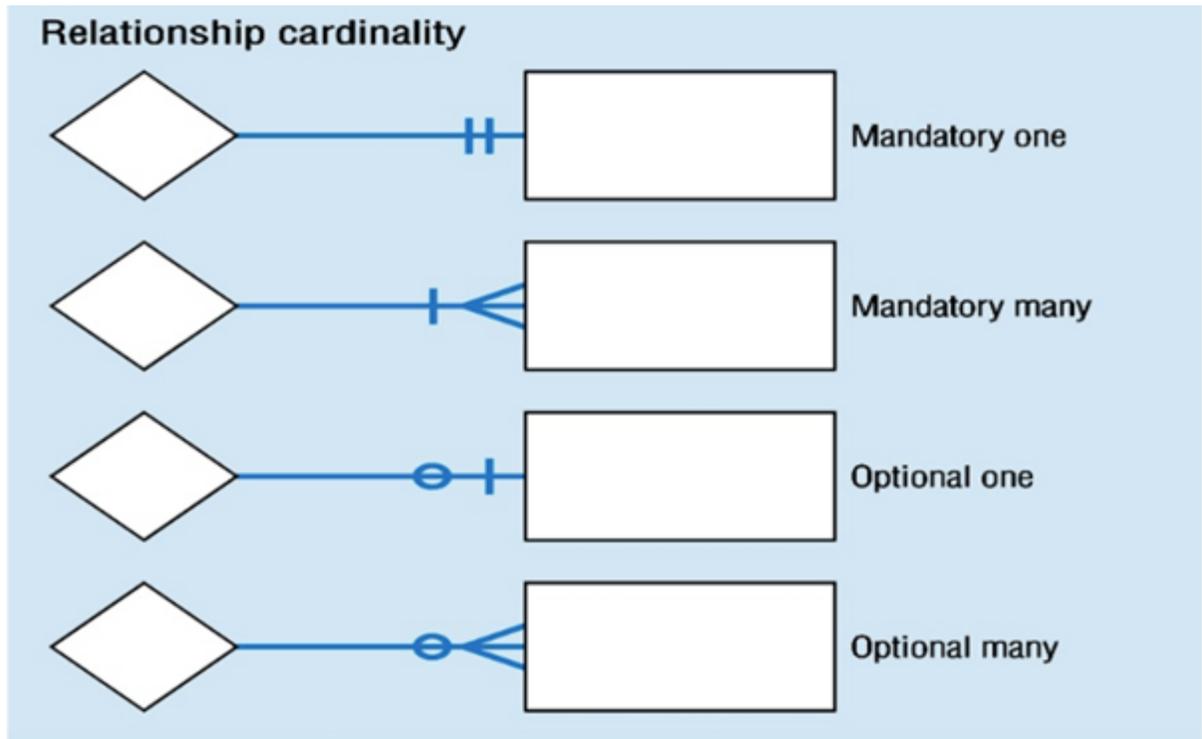
**Answer no 5:**

**Mandatory One/ Mandatory many:**

- A **Mandatory** Relationship is shown with a vertical line next to the cardinality. (Must be at least one entity "A").

**Optional one/Optional Many:**

- An **Optional** relationship is shown with a hollow circle next to the cardinality. (There maybe 0 to many of Entity "B")



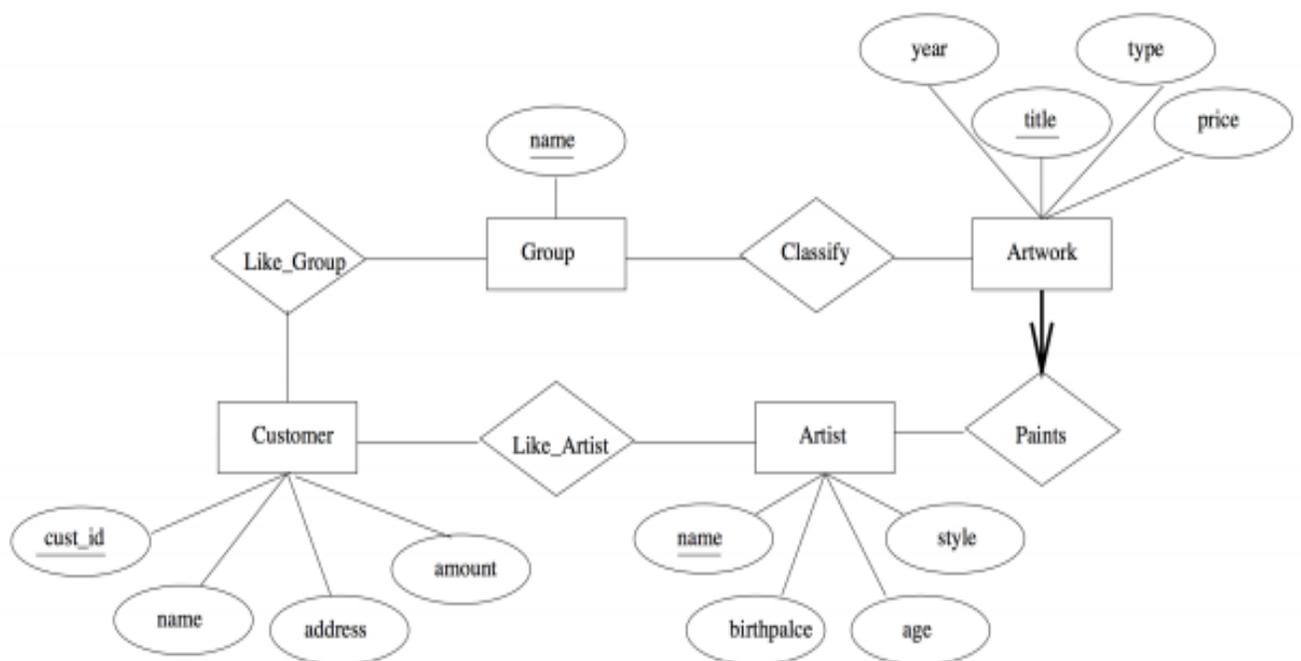
**Question no6:** Why is there an explicit need of backup in database approach?

**Answer no 6:** The explicit need of backup in database approach is because for a centralized shared database to be accurate and available all times, comprehensive procedure is required to be developed and used for providing backup copies of data and for restoring a database when damage occurs.

**Question no(2):** Draw an ERD from the following business rules: Use proper notations for the type of attributes?

**Answer no (2):**

**ERD Diagram of Business Rules:**

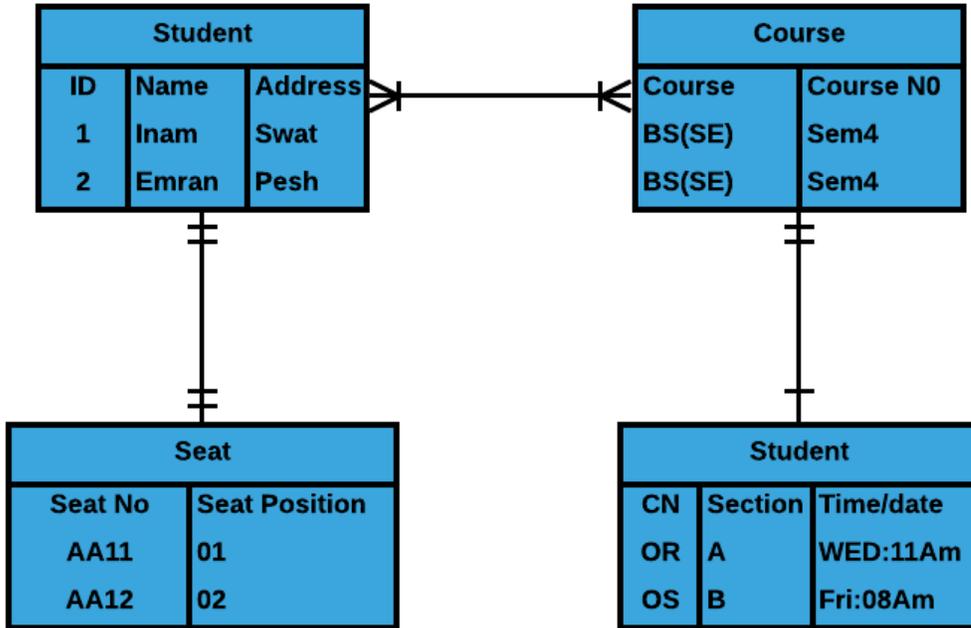


**Question no(3):** Convert the following Conceptual Model to Relational Model?

**Answer no (3):**

**Mapping Process:**

- Create table for weak entity set.
- Add all its attributes to table as field.
- Add the primary key of identifying entity set.
- Declare all foreign key constraints.



The end .

