DATABASE MANAGEMENT SYSTEM

MC-302

ASSIGNMENT-1

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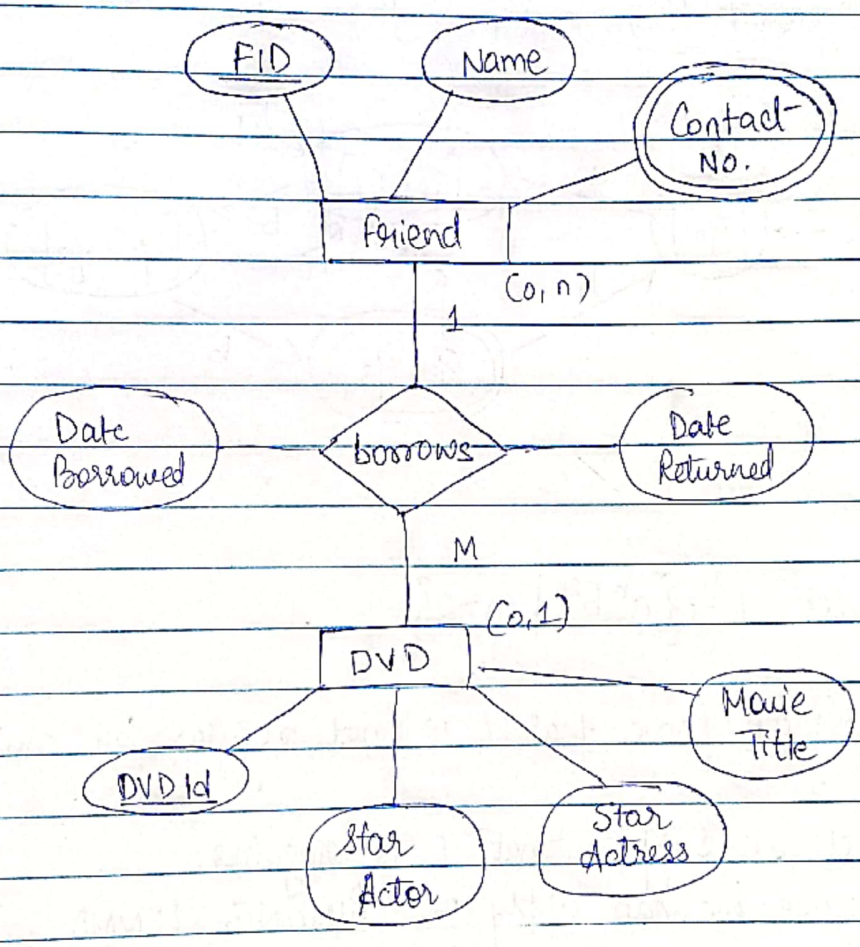
2K18/MC/008

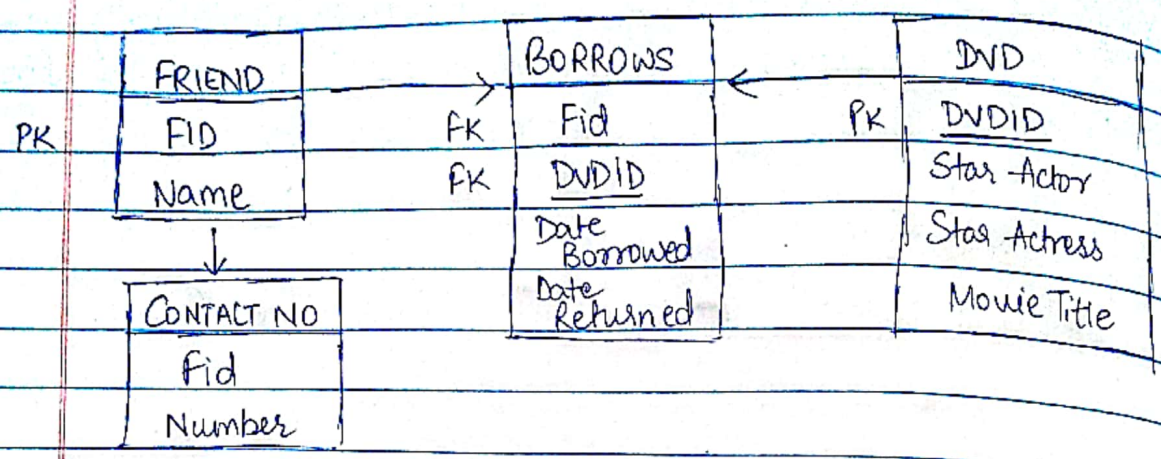
1.



Let us assume a friend can borrow multiple DVDs at a time and a DVD can only be borrowed by one friend at a time.

In case of movie DVD there will be an entity with DVD Id and album_name as attributes

RELATIONAL SCHEMA



(2.)
- An ER diagram is the actual blueprint of the database.
- Its composition must reflect the organization's operations accurately if the database is to meet that organization's data requirements.
- It forms the basis for a final check on whether the included entities are appropriate and sufficient, on the attributes found within those entities and on the relationship between those entities.
- Its also used as a final crosscheck against the proposed data dictionary entries
- It serves as implementation guide to those who create the actual database.

(3.) If a property can have multiple values then it is known as a multi-valued attribute.

The two courses of actions available to a database designer when he encounters a multivalued attribute are:

(i) Designer can either treat it as a normal attribute and create separate attributes for each value of this property but this process is not scalable and will result in wastage of memory.

Eg PERSON TABLE

PID	Name	Contact_1	Contact_2	Contact_3

(ii) The designer can create a separate relational table for this attribute. This will add to the complexity of the database but management will become much easier.

Foreign Key.

PID	Contact

(4) (a) $F = \{ XY \to W,\ Y \to Z,\ WZ \to P,\ WP \to QR,\ Q \to X \}$

$(XY)^+ = XYWZPQRX$

Hence $XY \to Q$

(b) $R(A, B, C, D, E, F)$

$F = \{ A \to B,\ C \to DF,\ AC \to E,\ D \to F \}$

Let us find closure of AC

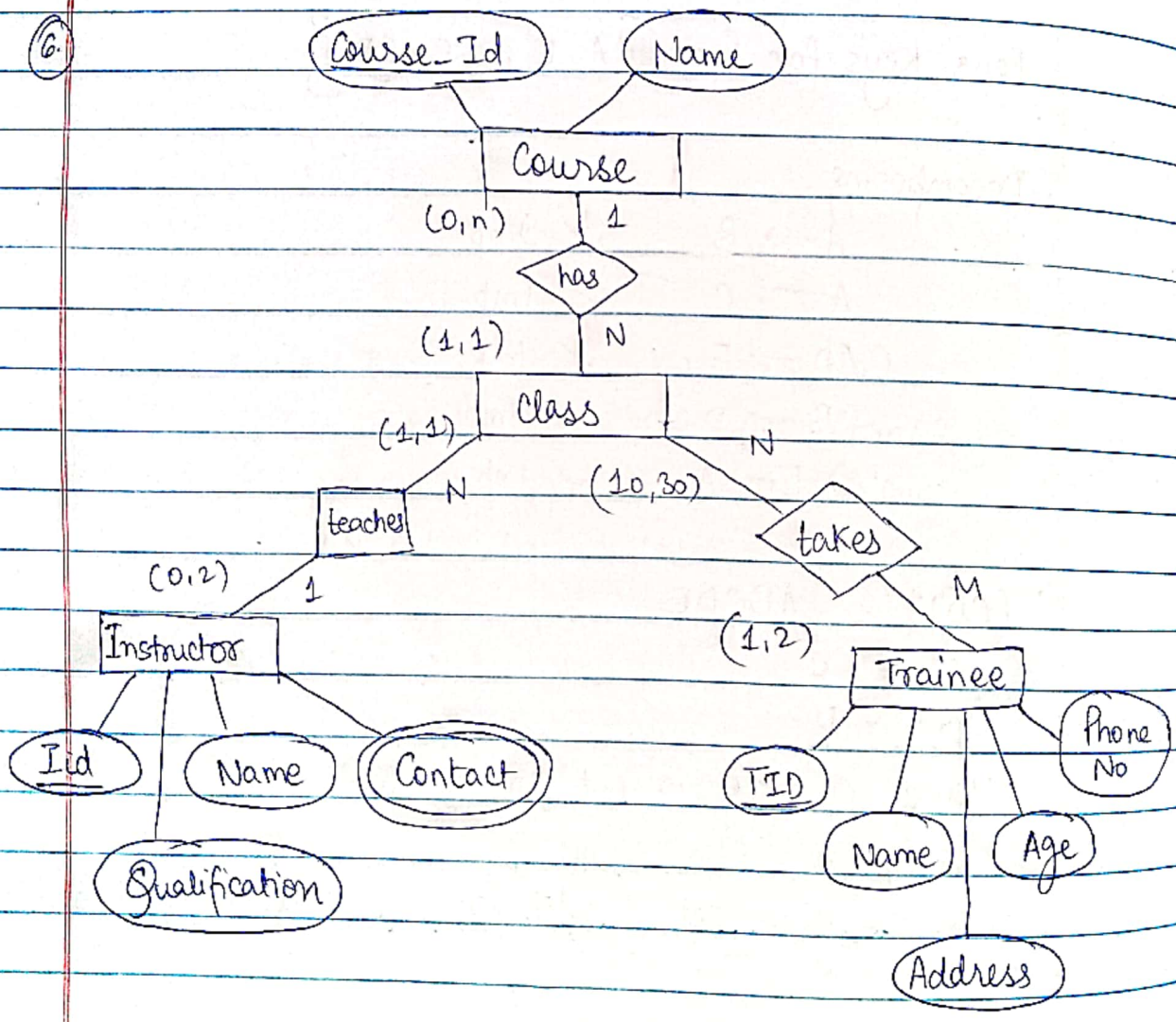
$(AC)^+ = ACBDFE$

Hence AC is the Key of $R(A, B, C, D, E, F)$

5. Data redundancy occurs when some data is stored multiple times unnecessarily in a database. It causes wastage of memory and various problems like insertion anomalies, deletion, updation, anomalies.

To control redundancy we can use normalization, which is a process of minimizing redundancy from a set of relations and thus creating better relational tables with less redundancy.

6.



7. $R(A, B, C, D, E)$

$F = \{ A \to BC,\ CD \to E,\ B \to D,\ E \to A \}$

$A^+ = ABCDE$ — A is Key

$B^+ = BD$

$C^+ = C$

$D^+ = D$

$E^+ = EABCD$ — E is Key

$(BC)^+ = BCDEA$ — BC is Key

$(CD)^+ = CDEAB$ — CD is Key

Four Keys for R: $\{A, E, BC, CD\}$

Decomposing.

$A \to B$ ✓ Imp

$A \to C$ ✓ Imp

$CD \to E$ ✓ Imp

$B \to D$ ✓ Imp

$E \to A$ ✓ Imp

$(CD)^+ = ABCDE$

$C^+ = C$

$D^+ = D$

Hence $CD \to E$ is not extraneous

Hence the given set of dependencies is already irreducible.

8. (a) CREATE table SHOP (
Shop_No int PRIMARY KEY,
Shop_Name varchar (20),
Address varchar (50),
Owner varchar (25));

CREATE table CUSTOMER (
C_No int PRIMARY KEY,
C_Name varchar (25),
C_Address varchar (50));

CREATE table ITEM (
I_No int PRIMARY KEY,
I_Name Varchar (20));

CREATE table SUPPLIED (
I_No int,
C_No int,
Shop_No int,
Date date,
Price decimal,
PRIMARY KEY (I_No, C_No, Shop_No),
FOREIGN KEY (I_No) REFERENCES Item (I_No),
FOREIGN KEY (C_No) REFERENCES Customer (C_No),
FOREIGN KEY (Shop_No) REFERENCES Shop (Shop_No));

CREATE table REQUIRES (
C_No int,
I_No int,
PRIMARY KEY (C_No, I_No),
FOREIGN KEY (C_No) REFERENCES Customer (C_No),
FOREIGN KEY (I_No) REFERENCES Item (I_No));

(b) (i) name of customers who have supplied items of maximum total value.

```
SET @MAX_TOTAL = (SELECT max (total_value) FROM
(SELECT C_No, SUM (Price) AS total_value FROM
Supplied GROUP BY C_NO) sum_items);

SELECT C_name
FROM Customer c, Supplied S
where C.C_NO = S.C_NO
HAVING SUM (Price) = @MAX_TOTAL;
```

(ii) Names of customers who are supplied all the items from only 'Ji Ndal Stores'.

```
SELECT C_name
FROM Customer C, Supplied S
WHERE C.C_NO = S.C_NO
AND Shop_No = (SELECT Shop_NO FROM Shop
WHERE Shop_Name = "Ji Ndal Stores")
AND S.C_NO IN (SELECT C_no FROM Supplied
GROUP BY C_NO HAVING COUNT (DISTINCT Shop_no) = 1);
```

(iii) Shop owners who supplied some item to the address "Krishna Nivas, MG Road".

```
SELECT owner
FROM Shop Sh, Customer C, Supplied S
WHERE Sh. Shop_NO = S. Shop_NO AND C. CNO = S.C_NO
AND C_Address = "Krishna Nivas, MG Road";
```