Name: MD. ABU AMMAR Set: A

ID: 1821944642 Section: 04

Ans: 1

(a) Data Definition Language: Data definition language or DDL consist of various SQL commands by which we can create or define a database schema. It usually deals with description of database schema and to create and modify the structure of database objects in the database. Such as we can create the database including its table, index, function etc. we can also drop, alter and truncate the database objects.

(b) Data Manipulation Language (DML):

The SQL or MySQL commands that use to manipulate the data of a database referenced as Data Manipulation Language or DML. Using DML we can insert, retrive, modify and delete datas in the database. A DML may be Navigational and declarative. ~~A N~~ In Navigational DML developer need to tell how and what to change. ~~But~~ But in Declarative DML only needs to define what is needed, we don't have to tell how.

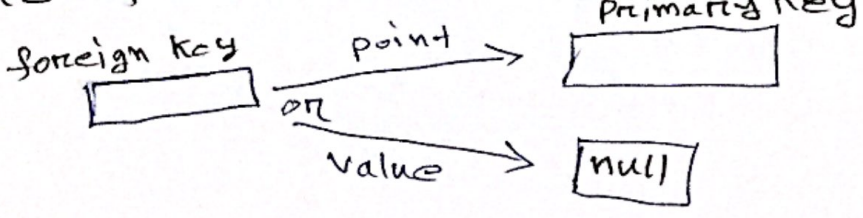
Ans: 2

(a) Relational Integrity constraints:

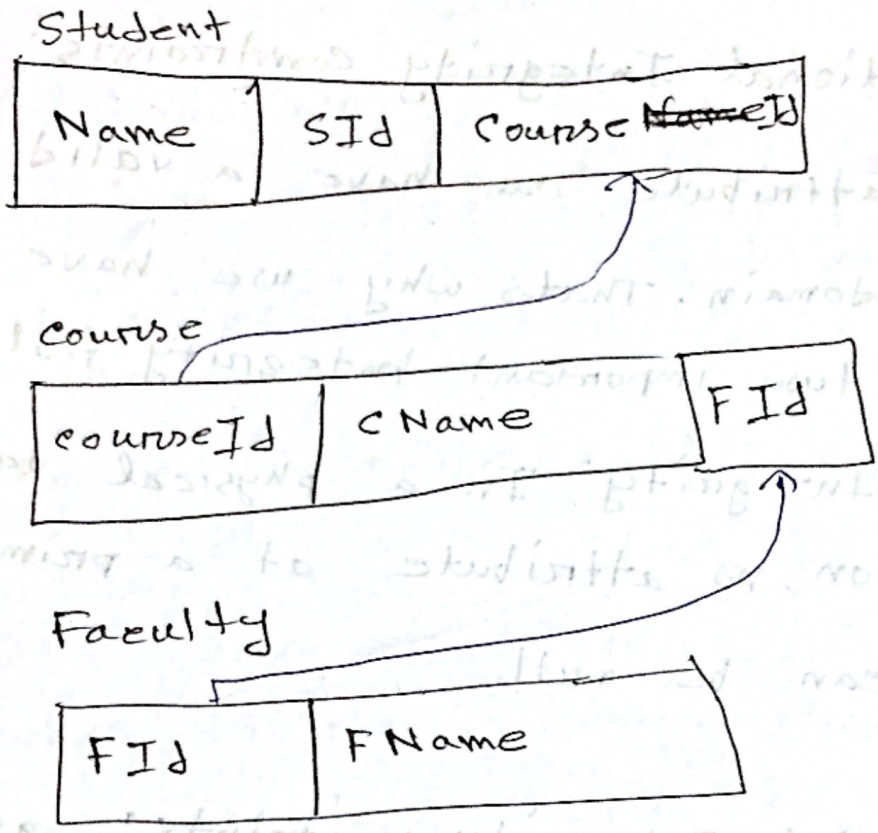
An attribute can have a valid value of its domain. Thats why we have to consider two important integrity rules:

i. Entity Integrity: In a physical database relation, no attribute of a primary key can be null.

ii. Referential Integrity constaints: If a foreign key exist in a relation, then there can be two things. One is the foreign key value must match a candidate key value of some tupple in its home relation ~~and~~ or 2nd is the foreign key value must be wholly null. It is likely-



Example of Relational Integrity constraints.



(b) The relational algebra is a theoretical language with various operations that work on one or more relations to define another relation without changing the original relation or relations.

There are three types of Relational Algebra operations:

i. Relational Database Operations: It include select, project and join operation.

ii. Set Theoretic Operations: It consist of Union, Intersection, Set Difference, and cartesian product operation.

iii. Additional Relational Operations: It includes Aggregate, Grouping, and outer join operation.

Ans: 3

(a) Domain: A domain is a set of allowable values for one or more attributes.

A set of values $D = \{D_i \mid i = 1, 2, \ldots, n\}$ where D is domain name and D_i is a domain element.

For example

LName Dom = {'Susan', 'James', 'John', ...}

FName Dom = {'Smith', 'Bond', 'Cecil', ...}

Major Dom = {Comp, Math, Civil, ----}

(b) Natural Join: The Natural Join is an Equijoin of two relations M and N over all common attributes, but one occurrence of each common attribute is discarded from the output.

Example. let M and N two table as following-

M

A	B
1	2
3	3
4	4

N

B	C
2	7
4	9
10	0

Now if we do natural join such that M.B = N.B then we find the following output.

$M \bowtie_{M.B=N.B} N$

A	B	C
1	2	7
4	4	9

Ans:- 4

(a) The appropriate database relation schemas with appropriate attributes are:

Food (FName, FId, Fdetails, Fprice)

Customer (CName, CId, Corder, FId, Cpay)

Disc_card (DId, Dpercent, CId)

(b) For Food table: primary key 'FId'.

For Customer table: 'CId' is primary and 'FId' is Foreign key

For Disc_card: 'DId' is primary key and 'CId' is foreign key

(c)

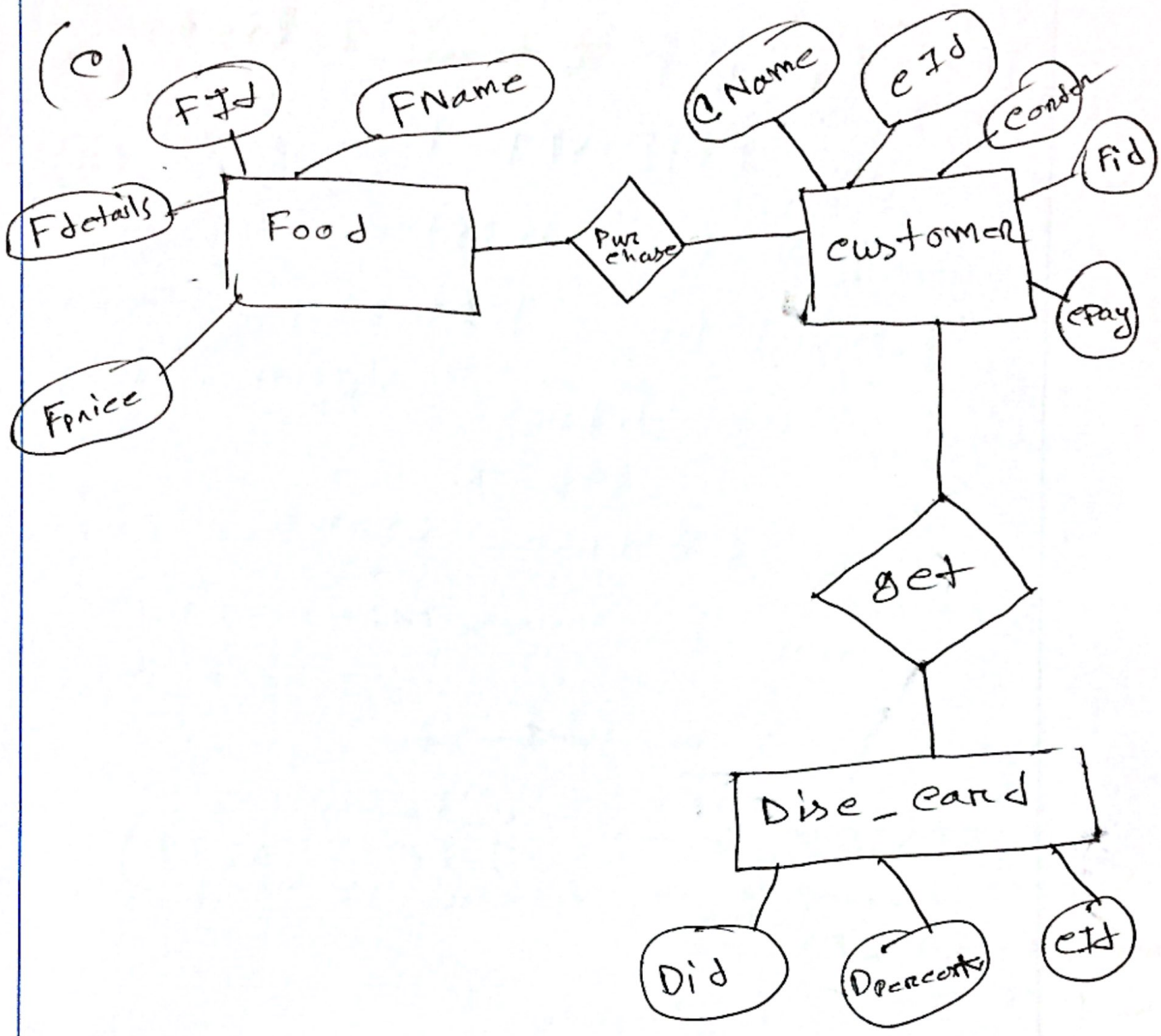


Fig: ER Diagram

Ans: 5

(a)

(i)

$$\pi_{Dno}\left(\sigma_{FName='Franklin'}(Employee)\right)$$

(ii)

$$\pi_{DEPARTMENT.DName}\left(\sigma_{DEPT\_LOCATIONS='Stafford'}\left(DEPARTMENT \bowtie_{DEPARTMENT.Dnumber=DEPT\_LOCATIONS.DNumber} DEPT\_LOCATIONS\right)\right)$$

(b)

(i)

```
Select E.FName, E.Lname
from EMPLOYEE E
Join WORKS_ON W
on E.Ssn = W.Essn
where W.Hours > 20;
```

(ii)
```
Select * E.Fname, E.Lname
from EMPLOYEE E
Join Department d
on E.Dno = d.DNumber
where d.Dname = 'Research';
```

(iii)
```
Select e.Fname, e.Lname
from Employee e
Join works_on w
on e.Ssn = w.Essn
where w.Hours is null;
```