Data-Base Concept

Que-1 What is database? Explain the different I and II types of databases.

Ans-1 Database is a collection of information organised in such a way that it can easily be accessed, managed and updated.

Traditional databases are organised by fields, records and files. A field is a single piece of information stored in a column. A record is one complete set of fields and a file is collection of records.

NAME	CLASS	MARKS
Vanshika	8	25
Harshita	7	23
Taya	6	24
Shushma	8	22.

Field.

Record

Types of Databases

1) Centralised Database → A centralised database is a database located and maintained in

One location. This type of database runs on a single computer platform. One main advantage of centralised database is that all data is located in one place. The main disadvantage is that bottleneck condition may occur.

2) **Distributed database →**

A distributed database is a database in which all the storage devices are not attached to a common CPU. It may be stored in multiple computers located in same physical location or may be located over a network. WWW is an example of distributed database.

Uses of database →

a) **Storing Information :-**

A database enables us to store large amount of information than a file. In file we can store a record about 50 or 100 people but not much more. But using database, we can store the record of thousands of people and much more.

b) **Retriving Information :-**

A database allows us to

retrieve our information

c) **Printing information :-** A database enables us to print our information on papers, labels or envelops ; letters , etc.

Que-2 What is DBMS ? Explain the different database programming languages.

Ans-2 To access information from a database, we need a DBMS. This is a collection of programmes that enables us to enter, organise and select data in a database.

DBMS stands for database Management System. Using it, we can organise, store and retrieve data from a database.

Some DBMS softwares are

DBase, SysBase, MS-Access, Oracle, SQL, FoxPro, etc.

Database Programming Languages

a) **Data Definition Language (DDL) :-** A data definition language or data description language is a computer language for defining data structure. The schema of database

written in DDL. which describes how many types of fields, records can be used in a database. In DDL some statements used like create, alter, drop, etc.

b) Data Manipulation Language (DML) :-

Data Manipulation language is a family of computer languages used by computer programmers or database users to insert, delete and update data in a database.

In DML some statements used like select, update, insert, delete, etc.

c) Data Control Language (DCL) :-

A DCL is a computer language and subset of SQL used to control data in a database.

Some statements used in DCL are :-

Commit, grant, revoke, rollback, etc.

Que-3 Explain about different database related users.

Ans-3i) Database Administrator →

In a DBMS, there are two components, one is data and another is the program by which we access the

database. The person who controls all the DBMS is known as database administrator. The person who A database administrator has the following jobs :-

i) DBA can remove any object from the database.
ii) DBA can remove any user of the database.
iii) DBA prepares backup plans for the database.
iv) DBA can recover data in an emergency case.
v) DBA develops password system for the database.

ii) Application Programmer → We can access database using any program. Those people who prepare these type of application programs are known as application programmer.

iii) End User → Those people who sends query for accessing database are known as end users.

Que-4 What are datamodels ?

Ans-4 A datamodel is used to organise data. Datamodels are a logical representation of a business process in an organisation. Data model defines how the business interacts with people, places and things. The data model is used as a reference point for determining the rules and relationships between entities with an organisation. The purpose of datamodel is to describe how data can be used and represented effectively. Data models support data and computer system by providing the definition and format of data.

Data Modling → Data modling is a method in which user defines and analyse data requirements needed to support business purposes of an organisation.

Data model can be divided into following categories:-

i) Object based logical data model.
ii) Record based logical data model.

Qus-5 What is object based logical data model?

Ans-5 This data model describes the data at the view ~~level~~ labels. There are various object based data models like –

i) Entity relationship data model (ER data model)
ii) Object oriented data model
iii) Function data model.
iv) Symentic data model.

The most widely used data model is entity relationship data model. introduced by Peter Chen.

ER Data Model

ER Data model contains two main component One is entity and another is relationship.

a) Entity →

Peter Chen defined an entity as–
"A thing which can be easily identified."
An entity is any object, place, person or activity about which data is recorded.
If we represent any data model with the help of figure, then entities can be represented using ▭ (Rectangular box).
Entities are of two types :-

(A) Dependent Entity –:

An entity whose existence

depends on the existance of the another entity are called dependent or weak entity.

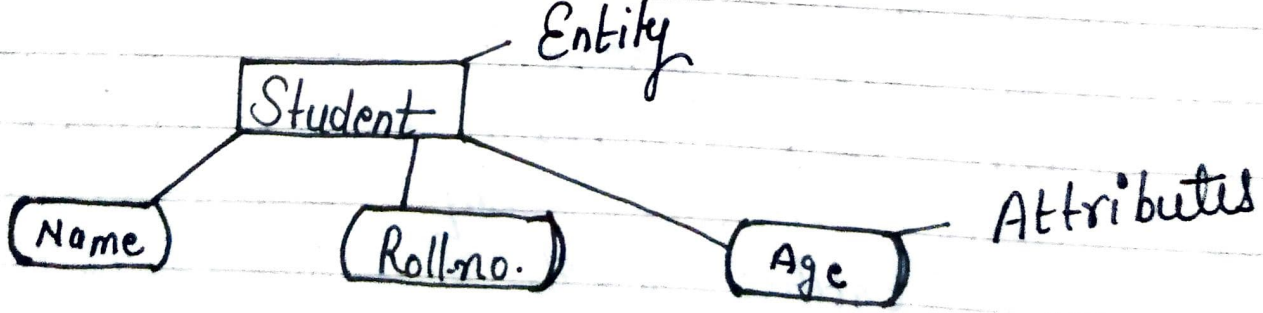
Example— Account entity is impossible without customer entity. Therefore, it is (account) an example of dependent entity.

(B) **Independent Entity :-** An entity which does not depend upon any other entity is known as independent entity or regular entity.

Ex:- Name is an independent entity.

Every entity has its characteristic characters and identity by which we know it. These characters are called attributes of entity. Attributes can be represented using ⬭ (Rounded Rectangle).

If Student is an entity and it uses three attributes name, roll-no., age, then we can display it using E-R data model like follows -



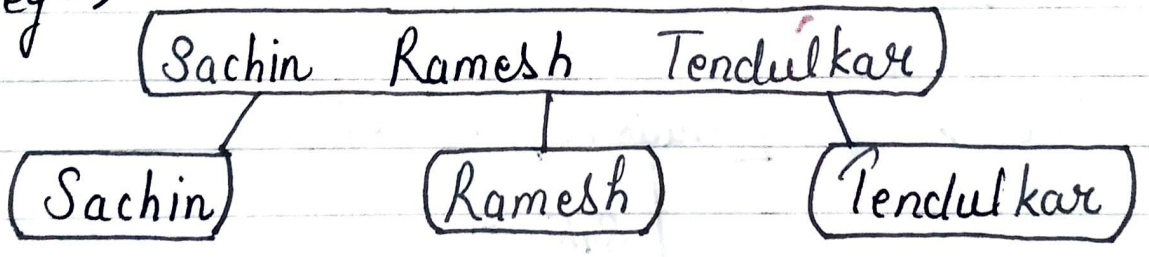
Types of Attributes

1) **Simple Attribute ⇒** Those type of attributes which can't be divided into sub-parts are known as simple attribute.

Eg :- Roll no. is simple attribute, it can't be divide into sub-parts.

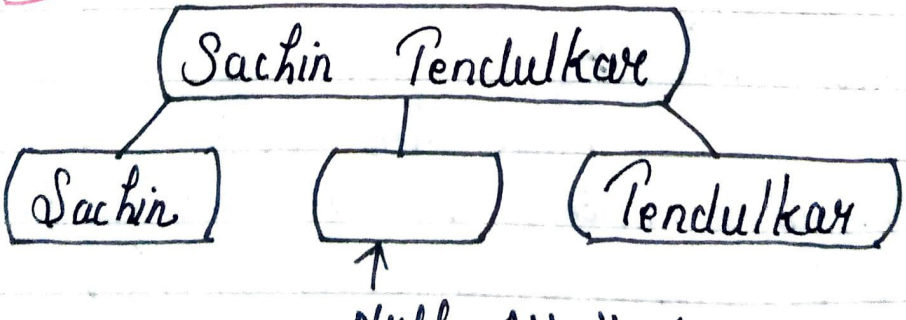
2) **Composite Attribute ⇒** Those attributes which can be divide into sub-parts is known as composite attribute.

for eg →



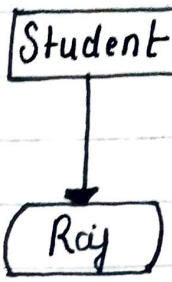
3) **Null Attribute ⇒** If any attribute has no value then that type of attribute is known as null attribute.

for eg →



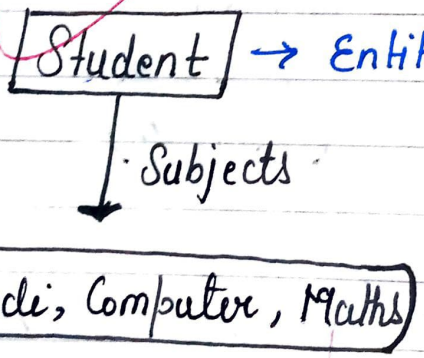
4) Single value Attribute ⇒ Those attributes which have only one value is known as Single value attributes.

Eg →



5) Multi-valued Attribute ⇒ Those attributes which have more than one value is known as Multi-valued attribute.

For eg →



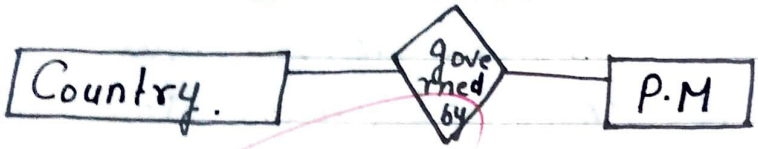
6) Relationship → Peter Chen defines a relationship as - "An association among entities." Relationship can be represented using ◇ (diamond shape box).

Relationship are of following types :-

A) **One to one Relationship →**

When any one entity establish relationship with any other one entity, then that type of relationship is known as one to one relationship.

Eg :- One country is governed by only single Prime Minister.

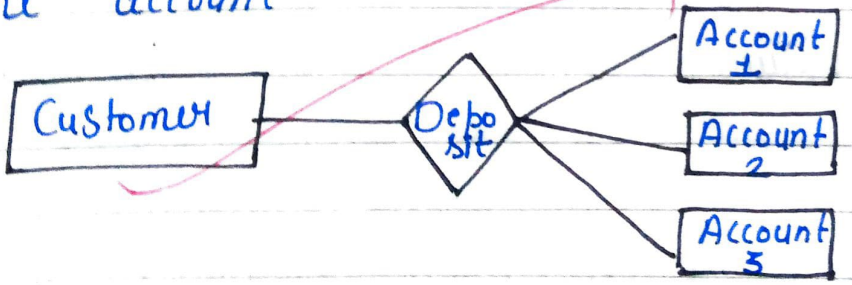


B) **One to many relationship →**

When any one entity establish relationship with more than one entity, then that type of relationship is known as one to many relationship.

Eg :-

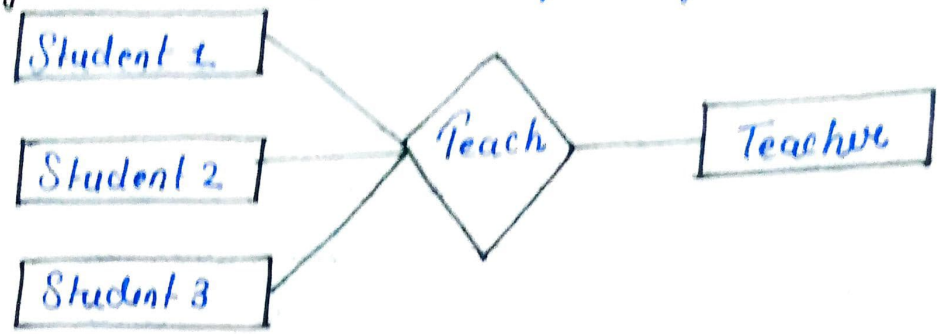
A bank customer can handle more than one account.



C) **Many to one Relationship →**

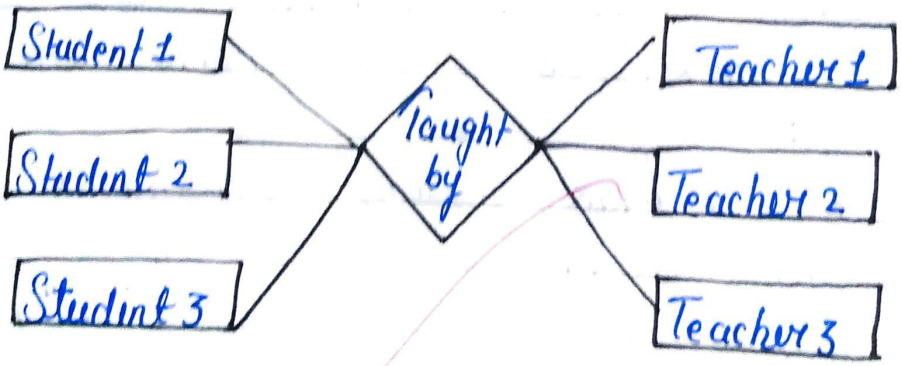
When more than one entity establish relationship with only single entity, then that type of relationship is known as Many to One Relationship.

for eg → Several students taught by one teacher.



D) Many to Many relationship → When more than one entity establish relationship bet with many other entities, then that type of entity is known as many to many relationship relationship.

For Eg → Several students taught by several teachers.



Que-6. What is Record based logical data model?

Ans-6 Record based logical data model is represented by table. In every table there are many rows and columns. Each row display a single record.

Name	Roll no.	Marks.
Jaya	1	20
Raj	2	18
Ranjeet	3	19
Tanya	4	16

The three types of record based logical data models are :-

a) Network Model →

The network model is similar to a hierarchial model in the way the data and the relations help among them. are represented in the form of Records and Links.

b) Hier Heirarchial Model →

Data is represented in the form of tree.

c) Relational Model →

Dr. Ef Codd first developed the relational data model in 1970. The relational model is an attempt to simplify the database structure. It represents all data in the database as simple tables. in the row/column format.

Que-7 What is Normalization? Explain the different normal forms.

Ans-7 Normalization is a process of designing database in a simple way. This process helps the user to design database in a way that it must support all requirements of DBMS. This process was developed by Dr. EF Codd in 1970.

Normalization are of following types:-

a) INF First Normal Form :-

A relation is said to be in first normal form (1NF) if it does not contain repetitive data in attributes & every data of an attribute should be an atomic value.

Any table called (1NF) only that condition when its any column (attribute) stores only single value.

Name	Subject	Marks
Ajay	Comp	23
	Hindi	24
	Math	25
Raj	P.Ed	26
	Math	27
	Comp.	25

Befor INF

Name	Subject	Mark
Ajay	Hindi	23
Ajay	Comp	24
Ajay	Math	25
Raj	P.Ed	26
Raj	Math	27
Raj	Comp	25

After converting in INF.

b) Second Normal form (2NF) →

In this form of normalization, there are two basic requirements, which are as follows:-

i) The table must be in the first normal form.
ii) The table must functionally depend upon primary key field.

↓ Primary key

Rollno.	Subject	Marks
101	Comp	23
105	Hindi	27
104	Maths	24
103	P. Ed	25
102	Comp	26
107	Hindi	27

2NF

c) Third Normal form (3NF) →

When non-primary key field only depend upon primary attribute key, then that table is known as 3NF.

Roll no.	Name	Marks
101	Raj	48
102	Anil	42
105	Ajay	48
109	Raj	39
107	Ajay	42
110	Sunil	39

3NF

d) Boyce Codd Normal form →

This code was developed by Raymod F Boyce and Dr. E.F. Codd. in 1974. Any table called Boyce Codd Normal form in only that condition when its every field works like candidate key. BCNF table also shows the character of 3NF

Que-8 Write different advantages of database.

Ans-8 Following are the main advantages of database-:

i) Storage →

A database is used to store, add, delete, update and organise information.

ii) Easy Search and update → A database allows us to search and update hundreds of record at single click.

iii) Consistent data → Data stored in a database is centralised, modified and deleted at the same time or same place. This avoids data inconsistency.

iv) Sharing data → Databases store data in a centralised manner and this nature of storage allows resources or data sharing.

v) Reduction of Data Redundancy → Database usually stores data in a centralised manner. That helps us to avoid duplication of information or data.

vi) Data Security → All the latest database management system support data security.