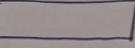


	<u>1 Mark</u>
1.	what is DBMS?
A.	Database Management System or DBMS is a software designed to assist in maintaining and utilizing large collections of data.
2.	Define Data model ?
A.	Data model is a collection of high-level data description constructs that hides many low-level storage details. DBMS allows a user to define the data to be stored in terms of data model.
3.	Define Entity ?
A.	An entity is an object in the real world that is distinguishable from other objects. - It is denoted by a rectangle  - Ex:- Student, Book etc.,
4.	List out any three advantages of DBMS?
A.	Advantages of DBMS are:- 1. Data independence 2. Efficient data access 3. Data integrity and security 4. Data administration 5. Concurrent access and crash recovery.

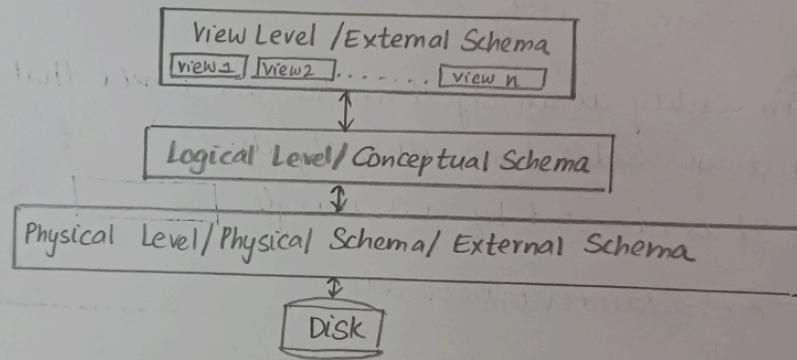
5. Define Relationship in ER Model ?

- A. Relationship is an association among two or more entities.  
- Relationship is represented by a rhombus 

3 Marks

1. Describe about Data Independence ?

- A. Data independence:- The ability to modify one level of Schema without affecting the other is known as data independence. It provides logical and physical data independence.  
- Data independence is achieved through use of three levels of abstraction.

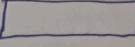


Logical Data Independence :- Provides protection from changes in logical structure of data.

Physical Data Independence :- The ability to modify the physical schema without affecting the logical schema.

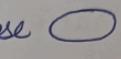
2. write about Entity, Attribute, and Entity set?

A. Entity:- An entity is an object in the real world that is distinguishable from other objects.

Entity- It is denoted by a rectangle 

Ex:- Student, Book etc.

Attribute:- Properties of an entity are called as attributes.

- It is denoted by an ellipse 

Ex:- Attributes of 'student' are ID, Name, Address etc..

Entity set:- An entity set is a set of entities of the same type that share the same properties.

Ex:- Set of all persons, set of all trees.

3. Explain Historical perspective of DBMS?

A. Historical Perspective of DBMS:-

-The first general purpose DBMS was designed by Charles Bachman in early 1960s. It was called Integrated Data Store. It formed the basis for the network data model.

1. Network Data Model:- In early 1960s, Charles Bachman

2. Hierarchical Data Model:- In late 1960s, IBM developed IMS (Information Management System).

- IMS formed the basis for hierarchical data model

3. Relational Data Model - In 1970s, Edgar Codd.

In 1980s, 1990s, so many advancements were made.

Ex:- ERP (Enterprise Resource Planning),

MRP (Management Resource Planning).

4. write down the advantages of DBMS?

A: Advantages of DBMS : The ability to modify one level of schema without affecting the other is known as data independence.

Efficient data access : A DBMS utilizes special commands to store and retrieve data efficiently.

Data Administration : Experienced professionals who understand the nature of data being managed, can be responsible for organizing the data representation to minimize redundancy.

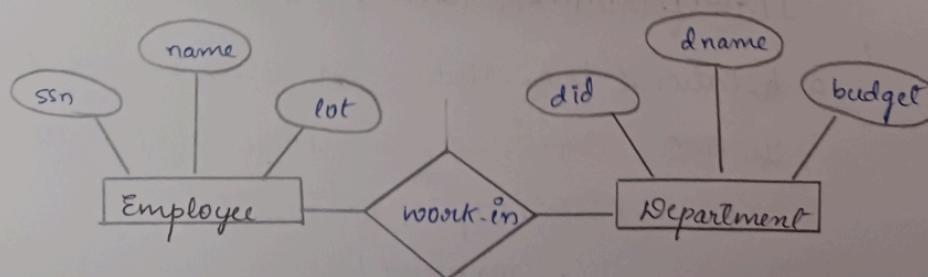
concurrent Access and crash Recovery:

DBMS provides → concurrent Access (at a time many users)

DBMS protects → effects from the system failures.

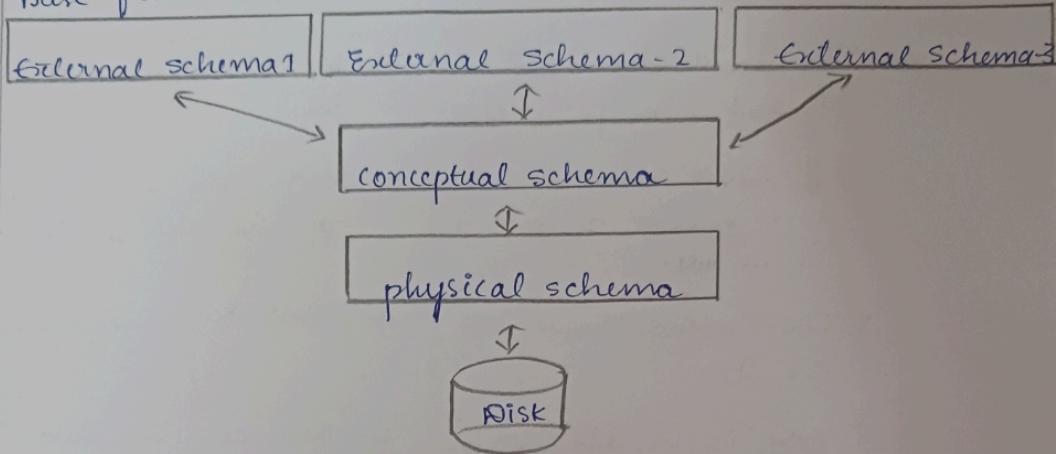
5. Explain ER Model with a suitable example?

A: Entity relationship model : ER model stands for an entity relationship model. It is a high-level data model. This model is used to define the data elements and relationships for a specified system. It develops a conceptual design for the database. It also develops a very simple and easy to design view of data.



5 Marks

1. Explain the three levels of abstraction in a DBMS?
- A: levels of Abstraction : Data abstraction is the method of hiding unnecessary data that are present in the data base from the End users.



External schema or view level : view provide security mechanism to prevent user from accessing certain parts of database. Application programs hide details of data types.

conceptual schema or logical level : This level tells how the data is actually stored and structured. we have different data model by which we can store the data. The data is stored in the database but the structure of the tables like student table, book table, are defined here in the logical level.

physical level or physical schema : It is the lowest level of Abstraction. It describes how data is actually stored in data base.

2. what is the difference between file system vs DBMS and explain?

### File Systems Versus DBMS:

#### File system

1. Redundant data can be present in a file system.
2. It doesn't provide backup and recovery of data if it is lost.
3. File systems provide less security.
4. There is less data consistency in file system.
5. Difficult to access the particular data from the file.  
Ex:- Total file to be accessed.

#### DBMS

1. In DBMS there is no redundant data.
2. It provides backup and recovery of data even if it is lost.
3. DBMS has more security mechanisms.
4. There is more data consistency because of the process of normalization.
5. Easy to access the required data.

3. Explain Database Design?

### Database design:-

process

The database design can be divided into six steps.

1. Requirements Analysis
2. Conceptual database design
3. Logical database design
4. Schema refinement
5. Physical database design
6. Application and security design.

1. Requirements Analysis :- In designing a database application is used to understand what data is to

be stored in the database.

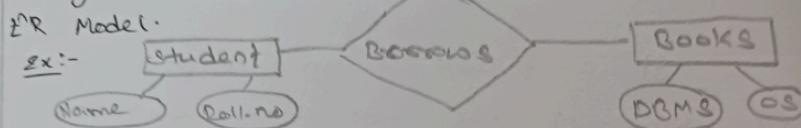
what applications must be built on top of it and what operations are most frequent and subject to performance requirements. specifications of user ref. ex:- student, Books.

## 2. conceptual database design :-

In this the conceptual database design , the specifications of user requirements are converted into

ER Model.

ex:-



## 3. Logical database design

Converting Conceptual database design into logical database design.i.e, In these ER Model are converted into a tables.

## 4. schema refinement

schema refinement is checking errors

## 5. physical database design

In this, we need to verify

- what data structures are used
- for retrieve data, what file organizations are used.
- How much size is required.

## 6. Application & security design:-

It Provide Permissions to different entities.

Hide the some information to some particular users.

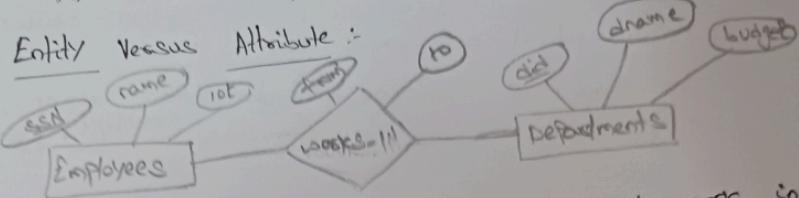
Providing the security to the database design.

## Q. Explain conceptual design with ER Model

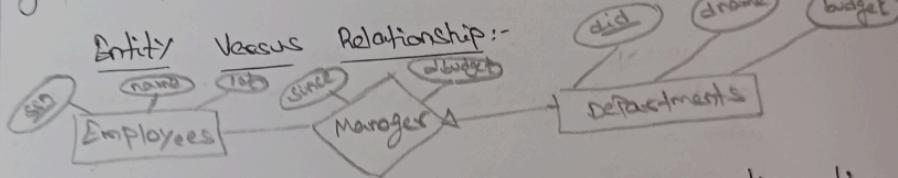
### A. Conceptual design with ER Model:-

Conceptual design is the process of creating a high-level model of a database that represents the data requirements and relationships of an organization.

The ER Model is a popular and widely used model for conceptual design that provides a graphical representation of entities, relationships and attributes in a database.



It is Possible for an Employee to work in a given department over more than one period.



Each department manager is given a discretionary budget (budget). we have also the relationship set to Manager.

Given a department, the manager, as well as the manager's starting date and budget for the department.

The manager receives a separate discretionary budget for each department.

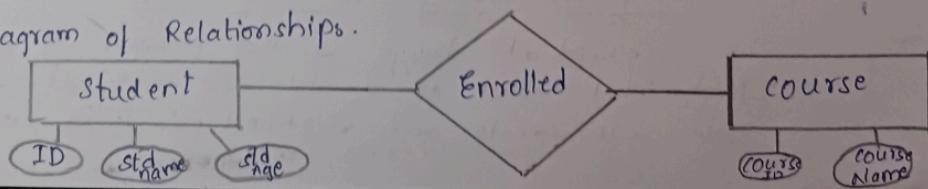
5. write about relationships and relationship sets?

A: Relationships and Relationship sets.

Relationships :- Association among two or more entities

Relationship Sets:- To connect entity sets.

Diagram of Relationships.



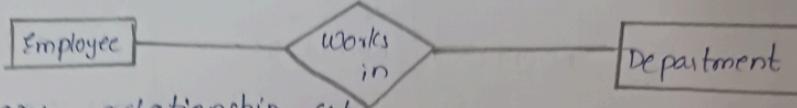
Types of Relationship sets :

i) Unary relationship set:

only one entity set participates in the relationship or

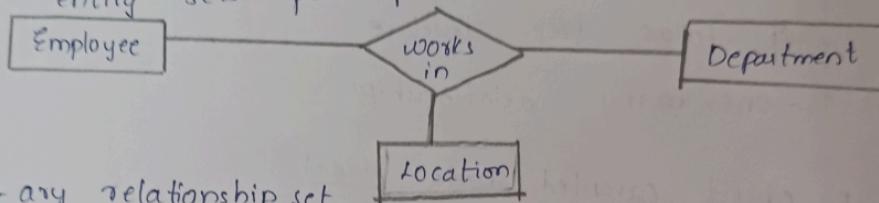
ii) Binary relationship set:

Two entity sets participates in the relation.



(iii) Ternary relationship set:

Three entity sets participates in the relation.



iv) N-ary relationship set:

'N' entity sets participates in the relation.

Q. What is a data model? Explain Data models in DBMS?  
(10 Marks)

A: Data Models:

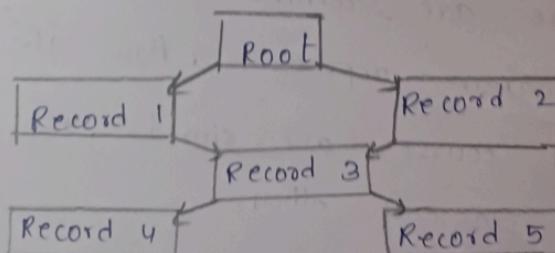
Data Model: A Data Model is a collection of high level data description constructs that hides many low-level storage details.

Types of Data Models:

It follows graph structure

It has many-many relationships

Q Network data Model

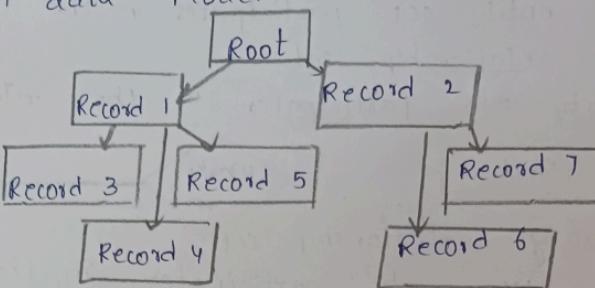


$$R_3 \rightarrow R_1 \& R_2$$

$$R_3 \rightarrow R_4 \& R_5$$

(ii) Hierarchical

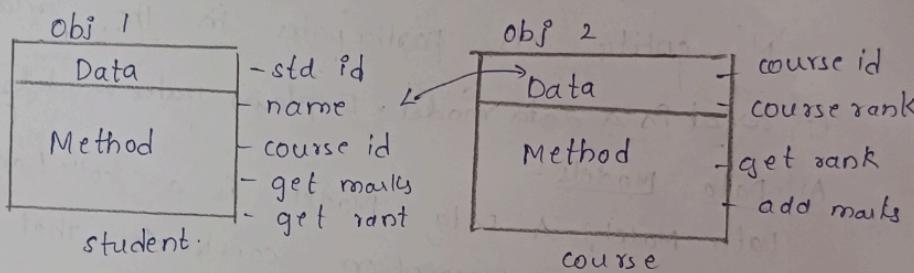
(ii) Hierarchical data Model.



It follows tree structure

- one-many relationships.

IV Object Oriented Data Model



- object means any real world entity which has physical existence.

- object contains data, method & relation with other.

- Both the objects communicate with each other

when there are common attributes.

- Above diagram represents how the data of student and course are stored and how they are linked to each other.

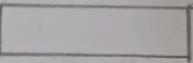
### (iii) E-R Data Model

Entity : Any real world object having physical existence.

Attribute : Properties of entities.

Relationship : Connection between two entities.

Rectangle - strong entity set



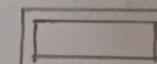
Ellipse - Attribute



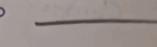
Rhombus - Relationship



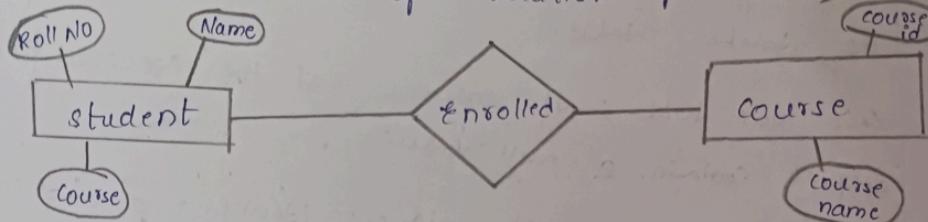
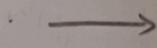
Double rectangle - weak Entity set



Undirected line - Flow of relationship



Directed line - flow of relationship



### (iv) Relational Model

std_id	Name	Marks
1	A	92
2	B	75
3	C	83

- It follows tabular structure
- Rows : Tuples , Columns , header : Attributes .
- Column info : Domain , Table : Relation

Ex: student relation    Schema : Representation , description  
of data in the form of data model

Q. Describe about additional features of ER model?  
(10 Marks)

A: Additional Features of the E-R Model

- 1) Key constraints
- 2) participation constraints
- 3) weak entities
- 4) class hierarchies
- 5) Aggregation

The ER (Entity Relationship) Model is a popular and widely used for database design that provides a graphical representation of entities, relationships and attributes in a database.

#### Key Constraints :-

Key Constraints specifies the attributes that uniquely identify a row in a given table.

Constraints are nothing but the rules that are to be followed while entering data into columns of the database table.

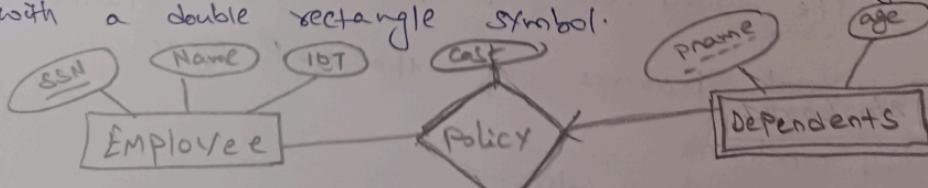
Ex:- NOT NULL : It ensures that the specified column doesn't contain a null value.

Primary key : It uniquely identifies a row in a table.

#### Weak Entities :-

In the ER Model, weak entities are entities that don't have a primary key of their own and depend on another entity to identify them.

Weak entities are represented in a diagram with a double rectangle symbol.



A weak entity set

## Class Hierarchies:

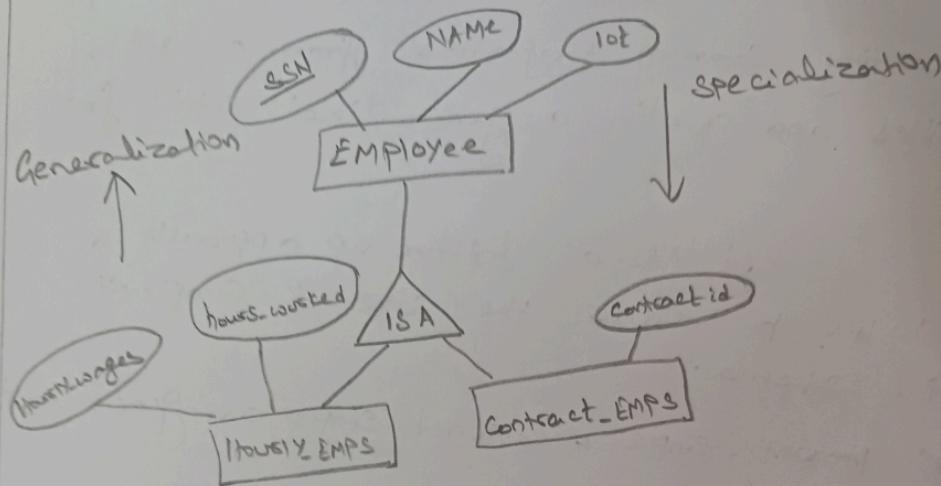


fig:- class hierarchies.

Sometimes it is natural to classify the entities in an entity set into subclasses.

1. specialization
2. generalization

1. specialization:- specialization is the process of identifying subsets of an entity set (super class) that share some distinguishing characteristic.

Super class is defined first, the subclasses are defined next & sub class-specific attributes and relationship sets are then added.

It breaks an entity into multiple entities from higher level to lower level. It is a top-down approach.

### Generalization:-

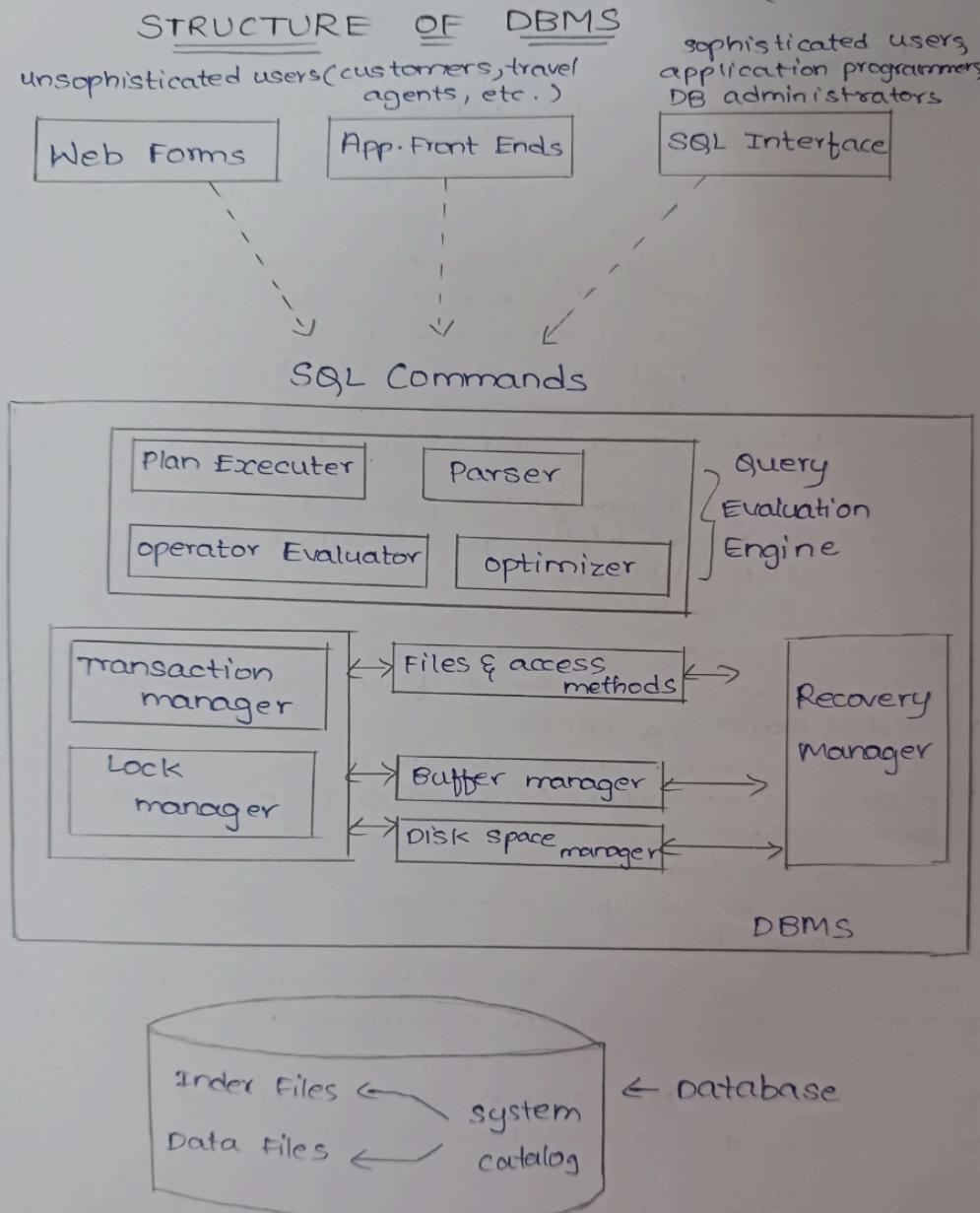
Generalization is a process of extracting common properties from a set of entities and creating a generalized entity from it.

4.

It is a bottom-up approach, & it helps to reduce the size & complexity of the schema.

e.g. Hourly-Emps & Contract-Emps are generalized by employees.

3. Explain the structure of DBMS with a neat diagram?  
(10 Marks)



The DBMS accepts SQL commands generated from a variety of user interfaces, produces query evaluation plans, executes these plans against the database.