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Subject: DBMS

Ch-1
Database System Architecture and Data Models.

MCQ

- (1) (A) Entity
- (2) (B) Record
- (3) (B) Program
- (4) (C) Both of them
- (5) (C) Foreign Key
- (6) (C) Candidate
- (7) (C) Update S set city = Kanpur where SNO = S1
- (8) (A) Oval; An oval with an underlined attribute.
- (9) (B) Composition attribute
- (10) (D) ~~weak~~ None of the mentioned

Fill in the Blanks

- (1.) Constraints
- (2.) tuple
- (3.) Relations
- (4.) Referential integrity constraints
- (5.) Mapping Cardinality.
- (6.) Database
- (7.) Data isolation
- (8.) Data
- (9.) Metadata
- (10.) Physical data independence

Short Questions

Q1

Define E-R Data Model.

Solⁿ

It is based on the view of real world entities and their relationships among them.

While expressing real-world scenario into the database model, the ER Model creates entity set, relationship sets, general attributes and constraints.

ER model mainly focuses on entities and their attributes and Relationships among entities.

It uses various types of symbols to represent objects of database.

Q2

Define Primary Key.

Solⁿ:

It is a specific choice of a minimal set of attributes that uniquely specify a tuple in a relation.

Q.3 Define Weak Entity Set.

Solⁿ

An Entity Set that does not have a primary key of its own is known as Weak Entity Set. This entity is known as Dependent Entity.

Q.4 What is generalization?

Solⁿ

Generalization is a process of creating group from several entities.

It determines the common features of multiple entities to create a new entity.

Its like union of two or more lower level entity sets to make higher level entity set.

Q.5 What is constraint?

Solⁿ

Constraints are the rules enforced on the data columns of a table. These are used to limit the type of data that can go into a table.

Constraints are normally divided in two types : (a) Disjoint constraints
(b) Participation constraints

Q.6 What is mapping cardinality?

Solⁿ

It defines numbers of times an entity of another entity set participate in a relationship set.

Q7 What is data abstraction?

Solⁿ

Database system are made up of complex data structures.

To ease the user interaction with database , the developers hide internal irrelevant details from users.

This process of hiding irrelevant details from user is called data abstraction

Q8 Define Naive Users (End Users)

Solⁿ

Unsophisticated users who have zero knowledge of database system . End user interacts to database via sophisticated software or tools .

Q9 Define SQL

Solⁿ

SQL stands for Structured Query Language

SQL lets you access and manipulate databases.

Q10 what is information?

Solⁿ

When data is processed, organized, structured or presented in a given context so as to make it useful , it is called information.

Long Questions

(Q1) Explain different types of attributes.

Solⁿ (a) Simple Attribute and Composite Attribute

⇒ Simple Attribute

It cannot be divided further in more sub parts.

It is like undivided atomic value

Example: Price, Year, Enno, CPI

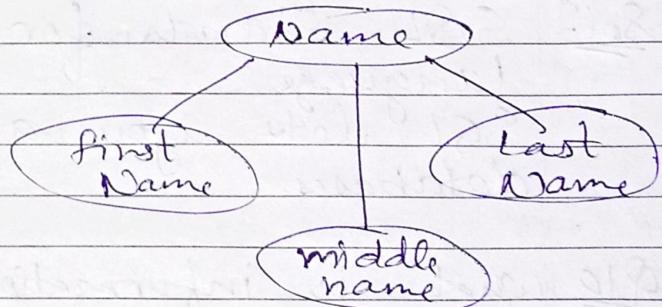
CPI

⇒ ~~Composite~~ Composite Attribute

It can be divided further in more subparts.

It is an attribute composed of many other attributes.

Example: Name (first name, middle name, last name)



(b) Single valued and multi-valued attributes

⇒ Single-Valued Attribute:

As name suggests it has single value only.

Example: Enno, Birthdate.

Enno

⇒ Multi-Valued Attribute:
It has multiple/more than one values.
Example: Phone No.
(Person may have multiple phone numbers)

Phone No.

(c) Stored attribute and Derived attributes.

⇒ Stored attribute:
In this attribute value needs to be stored/defined manually.

Example: Birthdate, Height.

Height

⇒ Derived Attribute:

Derived attribute value can be calculated or derived from other attributes.

Example: Age (can be derived from current date and birth date)

Age

(d) Complex Attribute:

Attribute that are derived by nesting the composite and multivalued attributes are called complex attributes.

Address-phone (phone), address (H.no., city, state))

Complex
Attribute

AV
Attribute

Composite
Attribute

(E) Key Attribute

Attribute which uniquely identifies each entity in the entity set is called key attribute.

For example, RollNo will be unique for each student.

It is denoted by an oval with underlying lines.

Roll-No

(F) Descriptive attributes

If any relationship has an attribute like entity then it is known as descriptive attributes.

Q.2 Explain Extended E-R features.

Generalization:

It determines the common features of multiple entities to create a new entity.

It is a process of creating group from several entities.

It follows a bottom-up approach.

Specialization:

It divides entity to make multiple that inherit some features of splitting entity.

It is a process of creating subgroups within entities.

It follows a top-down approach.

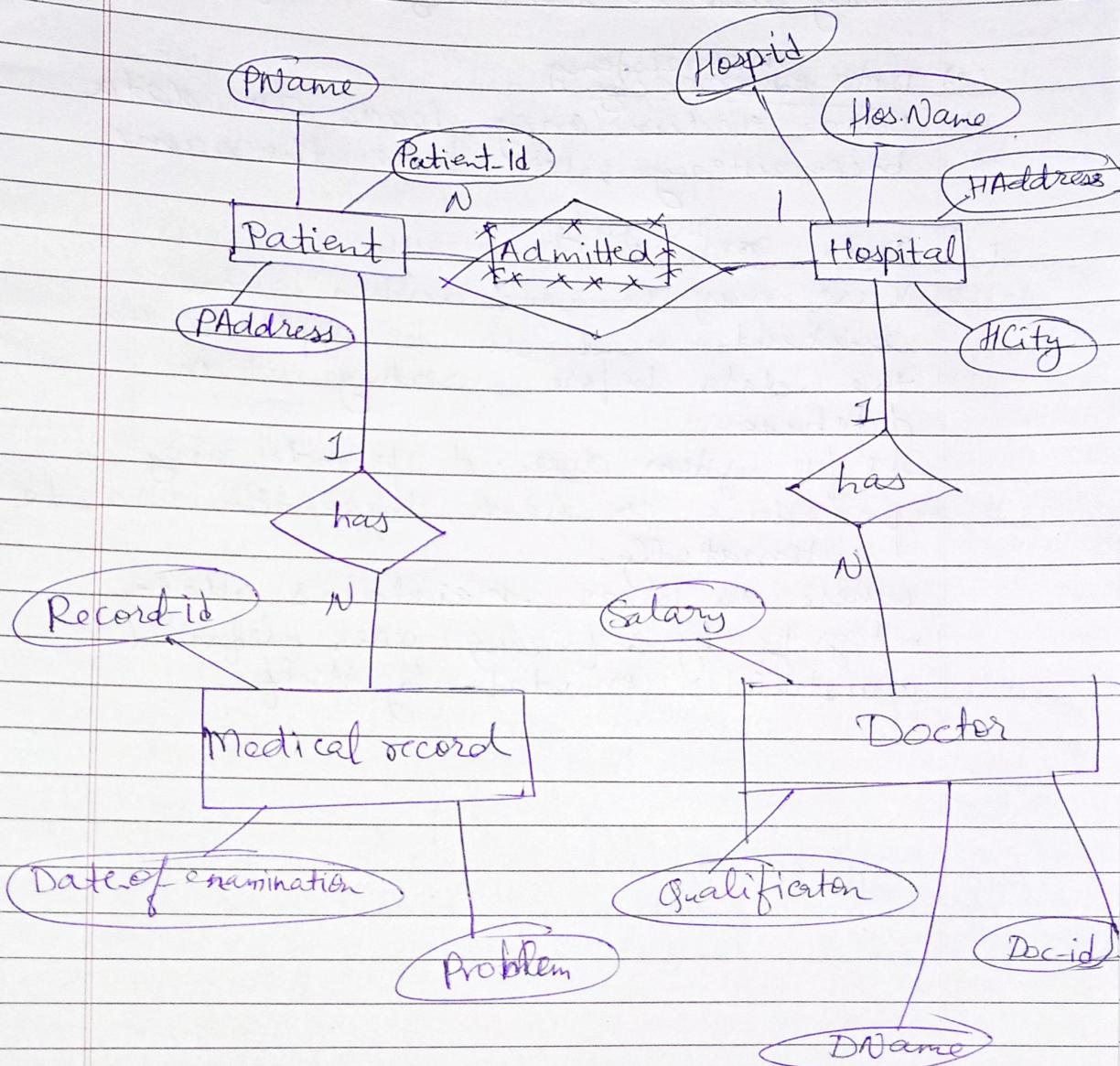
Aggregation:

Aggregation is kind of abstraction which treats relationships as entities. It is process of creating single entity by combining components and relationships between two entity of ER model.

Ques

Explain E-R diagram of Hospital management system.

Solⁿ



Q4 Explain advantages of DBMS over file management system.

Soln (a) Data Redundancy and inconsistency

(b) Data Sharing

File system does not allow sharing of data or sharing is too complex.

whereas in DBMS, data can be shared easily due to centralized system.

(c) Data inconsistency

Data redundancy leads to data inconsistency, let's take the same.

(d) Data Integrity

There may be cases when some constraints need to be applied on the data before inserting it in database.

The file system does not provide any procedure to check these constraints automatically.

whereas DBMS maintains data integrity by enforcing user defined constraints on data by itself.

Q.5

Explain the Role of DBA (Database Administrator)

Soln →

Schema definition:

- DBA defines the logical schema of the database.

→ Storage structures and access method definition.

- DBA decides how the data is to be represented in the database how to access it.

→ Defining security and Integrity constraints

- DBA decides on various security and integrity constraints.

→ Granting of authorization for Data access

- DBA decides on determines which user needs access to which part of the database.

→ License with users.

- DBA provide necessary data to the user.

→ Assisting application programmer.

- DBA provides assistance to application programmers to develop application programs

→ Monitoring performance.

- DBA ensures that better performance is maintained by making a change in the physical or logical schema if required.

→ Backup and recover.

- DBA backing up the database on some storage devices such as DVD, CD or magnetic type or remote ~~or~~ sever servers and recover the system in case of failures.