Question No: 1  (Marks: 1) - Please choose one
User rights information is stored in
► Physical database
► Catalog
► Logical database
► Buffer

Question No: 2  (Marks: 1) - Please choose one
Making a change to the conceptual schema of a database but not affecting the existing external schemas is an example of
► Physical data independence.
► Concurrency control.
► Logical data independence.
► Functional dependency

Question No: 3  (Marks: 1) - Please choose one
Identify the constraint that limits the values that can be placed in a column.
► NOT NULL
► CHECK
► FOREIGN KEY
► UNIQUE

Question No: 4  (Marks: 1) - Please choose one
Which of the following enforces a relation into 1st normal form?
► The domain of attribute must include only atomic values.
► Every non-key attribute is fully functionally dependent on primary key
► non-key attribute is non-transitively dependent on primary key.
Every non-key attribute is partially dependent on super key.

Question No: 5 (Marks: 1) - Please choose one
Controlling redundancy in a database management system DOES NOT help to
► avoid duplication
► avoid unnecessary wastage of storage space
► avoid unauthorised access to data
► avoid inconsistency among data

Question No: 6 (Marks: 1) - Please choose one
Which of the following is CORRECT about database management system languages?
► Data definition languages are used to specify the conceptual schema only.
► Data manipulation languages are used to create the database.
► Data manipulation languages are used for retrieval, insertion, deletion and modification of data.
► Data definition languages are only used to update data in the DBMS.

Question No: 7 (Marks: 1) - Please choose one
Which of the following is INCORRECT statement concerning the database design process?
► During requirements collection and analysis phase, one can gather the data requirements of database users.
► By referring to a high level data model, it is possible to understand the data requirements of the users, entity types, relationships and constraints.
► Transformation of the high level data model into the implementation data model is called logical design or data model mapping.
► During the logical design phase of internal storage structures, access paths and file organization for the database files are specified.

Question No: 8 (Marks: 1) - Please choose one
Identify the INCORRECT statement among the given.
► An entity may be an object with a physical existence like a car, a house or an Employee.
► One cannot consider something which has conceptual existence like a course in a degree program as an entity.
► Age can be considered as a single value attribute of a person.
► An entity type describes the schema or intension for a set of entities which share the same structure.

Question No: 9 (Marks: 1) - Please choose one
Select the correct statement among the following.

► Role names are not technically necessary in relationship types when all the participating entity types are distinct.

► When different entity types participate only once in a single relationship type it is called a recursive relationship.

► Cardinality ratios for binary relationship are displayed on Entity Relationship Diagrams by using a diamond shape notation.

► Partial participation which is also called existence dependency is displayed as a double line connecting the participating entity type to the relationship.

Question No: 10 (Marks: 1) - Please choose one

In a relation, which of the following refers by the Structural constraints?

► finding the owner entity type relevant to a given entity type.
► the number of relationship instances which an entity can participate in.
► the role that a participating entity from the entity type plays in each relationship instance.
► the constraints applicable in granting access to tables, columns and views in a database schema

Question No: 11 (Marks: 1) - Please choose one

Identify the correct statement.

► Entity integrity constraints specify that primary key values can be composite.
► Entity integrity constraints are specified on individual relations.
► Entity integrity constraints are specified between weak entities.
► When entity integrity rules are enforced, a tuple in one relation that refers to another relation must refer to an existing tuple.

Question No: 12 (Marks: 1) - Please choose one

Which of the following is true about relational schema?

► The sequence of columns is significant
► The sequence of rows is significant.
► Contains only derived attributes.
► Values are atomic.

Question No: 13 (Marks: 1) - Please choose one

Identify the factor which enforces a relation in 3NF?

► Every non-key attribute is fully functionally dependent on primary key
Every non-key attribute is partially dependent on super key

The domain of attribute must include only atomic values.

Every non-key attribute is non-transitively dependent on primary key.

Question No: 14  (Marks: 1) - Please choose one
If W, X, Y and Z are attributes of a relation, which of the following inference rules for functional dependencies is correct?

► If (X, Z) -> Y then X -> Y and Z -> Y.
► If X -> Y and X -> Z then X -> (Y, Z).
► If X ⊇ Y then Y -> X
► If X -> Y then (X, Z) -> (Y, W).

Question No: 15  (Marks: 1) - Please choose one
Which of the following is not a benefit of normalization?

► Minimize insertion anomalies
► Minimize deletion anomalies
► Minimize updation anomalies
► Maximize redundancy

Question No: 16  (Marks: 1) - Please choose one
A candidate key that does not have a null value and is selected to uniquely identify all other attribute values in any given row is called a ____.

► superkey
► candidate key
► primary key
► secondary key

Question No: 17  (Marks: 1)
What is sub-type discriminator?

The subtype discriminator, which you add to the super type table for a disjoint condition (or non-overlapping condition). The purpose of the subtype discriminator is to help you avoid having to write sub queries or joins just to find information

Such as the names of all AARP members. But when subtypes overlap, this simple discriminator structure doesn't work. You have to modify the structure….

Question No: 18  (Marks: 1)
In which condition a relation in first normal form, automatically turns into the second normal form?
Ans:
Those that do not depend upon the combination key, are moved to another table on whose key they depend on.

- Structures which do not contain combination keys are automatically in second normal form.

**Question No: 19 (Marks: 2)**

State the two major benefits of referential integrity constraints?

**Ans;**

Often, in relational database, we wish to ensure that a value that appears in one relation for a given set of attributes also appears for a certain set of attributes in another relation. This condition is called Referential integrity (RI). It is the concept of relationships between tables, based on the definition of a primary key and a foreign key.

The following summarize the benefits of referential integrity:

- Ensure data integrity and consistency based on primary key and foreign key.
- Increases development productivity, because it is not necessary to code SQL statements to enforce referential constraints, the Teradata RDBMS automatically enforces referential integrity.

**Question No: 20 (Marks: 3)**

Differentiate between relation and table.

The most commonly used DBMS is the Relational Database Management System (RDBMS). This system uses table structure that saves and controls the data. A table is a predefined category of data that consists of rows and columns. The columns save the qualities that describe the group of data. Every row contains full record of a particular data. Every table has a Primary key which denotes or uniquely identifies the row. These primary keys are also used in another table just to link the two tables and are known as foreign key.

**Question No: 21 (Marks: 5)**

Consider the following two columns. The **Column A** consists of terms related to the ER model and **Column B** consists of terms used in the relational model.

<table>
<thead>
<tr>
<th><strong>Column A</strong></th>
<th><strong>Column B</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Entity type</td>
<td>A. Primary or(Secondary) key</td>
</tr>
<tr>
<td>2. Key attributes</td>
<td>B. Domain</td>
</tr>
<tr>
<td>3. Composite attribute</td>
<td>C. Relation and foreign key</td>
</tr>
<tr>
<td>4. Multivalued attribute</td>
<td>D. Set of simple component attributes</td>
</tr>
<tr>
<td>5. Value set</td>
<td>E. Relation</td>
</tr>
</tbody>
</table>

The terms in **Column A** have been mapped to **Column B** so that it corresponds to the mapping process of the ER Model into a Relational model. Map each of the entry in column A to the appropriate entry in column B?

**Ans;**

A relation is a table that holds the data we are interested in. It is two-dimensional and has rows and columns.
Each entity type in the ER model is mapped into a relation.

- The attributes become the columns.
- The individual entities become the rows.

1-entity type\(\rightarrow\)relation

2\(\rightarrow\)key attributes\(\rightarrow\)primary or secondary keys

3\(\rightarrow\)composite attribute\(\rightarrow\)relation and foreign keys

**Question No: 22 (Marks: 10)**

Explain the significance of the data model. Why do we need to know the specific data model of any DBMS?

**Ans:**
The term database design can be used to describe many different parts of the design of an overall database system.

**Hierarchical Model**

**Network Model**

**Relational Model**

Data in a series of records, which have a set of field values attached to it. It collects all the instances of a specific record together as a record type. These record types are the equivalent of tables in the relational model, and with the individual records being the equivalent of rows. To create links between these record types,

Two types of data modeling are as follows:

- Logical modeling
- Physical modeling

If you are going to be working with databases, then it is important to understand the difference between logical and physical modeling, and how they relate to one another.

**Logical Modeling**

Logical modeling deals with gathering business requirements and converting those requirements into a model. The logical model revolves around the needs of the business, not the database, although the needs of the business are used to establish the needs of the database. Logical modeling involves gathering information about business processes, business entities (categories of data), and
organizational units. After this information is gathered, diagrams and reports are produced including entity relationship diagrams, business process diagrams, and eventually process flow diagrams. The diagrams produced should show the processes and data that exists, as well as the relationships between business processes and data. Logical modeling should accurately render a visual representation of the activities and data relevant to a particular business.

The diagrams and documentation generated during logical modeling is used to determine whether the requirements of the business have been completely gathered. Management, developers, and end users alike review these diagrams and documentation to determine if more work is required before physical modeling commences.

Typical deliverables of logical modeling include

- Entity relationship diagrams
  An Entity Relationship Diagram is also referred to as an analysis ERD. The point of the initial ERD is to provide the development team with a picture of the different categories of data for the business, as well as how these categories of data are related to one another.

- Business process diagrams
  The process model illustrates all the parent and child processes that are performed by individuals within a company. The process model gives the development team an idea of how data moves within the organization. Because process models illustrate the activities of individuals in the company, the process model can be used to determine how a database application interface is designed.

- User feedback documentation

Physical Modeling

Physical modeling involves the actual design of a database according to the requirements that were established during logical modeling. Logical modeling mainly involves gathering the requirements of the business, with the latter part of logical modeling directed toward the goals and requirements of the database. Physical modeling deals with the conversion of the logical, or business model, into a relational database model. When physical modeling occurs, objects are being defined at the schema level. A schema is a group of related objects in a database. A database design effort is normally associated with one schema.

During physical modeling, objects such as tables and columns are created based on entities and attributes that were defined during logical modeling. Constraints are also defined, including primary keys, foreign keys, other unique keys, and check constraints. Views can be created from database tables to summarize data or to simply provide the user with another perspective of certain data. Other objects such as indexes and snapshots can also be defined during physical
Physical modeling is when all the pieces come together to complete the process of defining a database for a business.

Physical modeling is database software specific, meaning that the objects defined during physical modeling can vary depending on the relational database software being used. For example, most relational database systems have variations with the way data types are represented and the way data is stored, although basic data types are conceptually the same among different implementations. Additionally, some database systems have objects that are not available in other database systems.

Typical deliverables of physical modeling include the following:

- **Server model diagrams**
  The server model diagram shows tables, columns, and relationships within a database.

- **User feedback documentation**
  Database design documentation