

2<sup>nd</sup> Sessional  
4<sup>th</sup> Semester / Comp. Engg.

Subject: Database Management System

Section - A

Ans-1

(i) Relation -

A relation is defined as a table which contains rows and columns and defines relation between these rows and columns.

These are the properties of a relation:-

- Every relation has a different name.
- Each cell of relation have some value.
- There is no specific order of columns.
- Every row is unique.
- Every attribute defines a different thing.

(ii) Define following :

a. Degree - The degree of a relation is defined as the no. of columns it contains.

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for example - if an<sup>a</sup> relation have five columns in it then it's degree will be 5 as well.

### b. Cardinality -

The cardinality of a relation is defined as the number of tuples/row it is having. It changes as we add or delete new tuple to a table. for example - if we have a table containing data of 5 students then its cardinality is 5.

### c. Relational Database -

A relational database has a set of tables / relation that contains data belonging to different rows and columns having a relation between them.

In this database, every row contains different data i.e. every row is unique.

for managing Relation Database, we need Relational Database Management Systems (RDBMS) as well.  
e.g. Oracle, Microsoft Access, SQL etc.

### (iii) Triggers -

The statement that a computer executes whenever any changes happen



to the database.

A trigger activates in response to any action like insertion, update and deletion of data from the database.

Triggers helps in keeping data pure in a database.

Some characteristics of trigger are -

- It can only applied on tables.
- It is automatically fixed by database system on any change happening in tables.
- It prevent any unwanted change in data.
- It cannot be nested more than 16 levels.

#### (iv) Normalization -

Normalization is defined as a process of removing faults from a database and make it convenient.

In Normalization -

- Data redundancy is removed (duplication)
- Duplicate rows and columns are removed.
- Different anomalies are removed.
- We make database more flexible.
- It helps to achieve good database habits.



(vi) Decomposition -

Decomposition is defined as the breaking of a large database into two or more databases.

It can be done as part of normalization as well.

# There are two types of decomposition:

- Lossy decomposition
- Lossless decomposition

a. Lossy -

In lossy decomposition, we break the database into two or more databases and also some part of it is left unused. This is called lossy decomposition. As if we try to combine the derived database, it won't give back the original database.

b. Lossless -

In Lossless Decomposition, we break the original database into two or more database as lossy but in this we do not left any column unused; we takes every column in any of the database so that we can get back the original database by combining these databases.



## Section - B

Ans-2Relation -

A relation is like a table in any relational database model. It consists of different rows and columns that are connected to each other with relationship. For example -

		Attributes (columns) →					
Rows/ Tuple/ Record		A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	A <sub>4</sub>	...	A <sub>n</sub>
	R <sub>1</sub>						
	R <sub>2</sub>						
	⋮						
	R <sub>m</sub>						

→ This is a relation with  $n$  columns and  $m$  rows.

Relational Model -

A relational model is basically a database with related information stored in table (with rows and columns).

In this model, each row depicts a real world entity or relationship.

The relational model is the most commonly used model in today's time as it is so convenient and neat to look at.





⇒ A relational model consists of the following things -

\* Relation - we have discussed before.

\* Attribute - Columns in a table / relation are also known as attributes. The number of attributes in a table defines the degree of relation.

\* Tuple / Record - The rows in a table are also known as tuple (Record). It contains value for each attribute.

\* Domain - category having Domain is like a subcategory of some attribute. For example, a student is the domain of gender.

\* Degree - The number of attributes in a table.

\* Cardinality - The number of records in a table / relation.

\* Keys - keys are very important in relational database. It is like an identifier for data.

⇒ keys are of different types, some these are -

Primary key, Candidate key, Super key, foreign key, composite key, etc.