Database Management System

1. RDBMS stands for------ *[SBI-2008]*
a) Relational Database Management System
b) Rational Development of Bank Management Software **Ans. a**
c) Regulation of Database & Management Structure
d) None of this
Explanation : RDBMS stands for **R**elational **D**atabase **M**anagement **S**ystem. RDBMS is the basis for SQL, and for all modern database systems like MS SQL Server, IBM DB2, Oracle, MySQL, and Microsoft Access.
A Relational database management system (RDBMS) is a database management system (DBMS) that is based on the relational model as introduced by E. F. Codd.

Flat file databases are most useful for ___
a) Large-scale users
b) Banking
c) Small-group situation
d) Chain stores
Ans.:c
Explanation: A **flat-file database** is a database stored in a file called a **flat file**. Records follow a uniform format, and there are no structures for indexing or recognizing relationships between records. The file is simple. A flat file can be a plain text file, or a binary file. Relationships can be inferred from the data in the database, but the database format itself does not make those relationships explicit.
Advantages
- ✓ Easy to understand.
- ✓ Easy to implement.
- ✓ Less hardware and software requirements.
- ✓ Less Skill set are required to hand flat database systems.
- ✓ Best for small databases.

Disadvantages
- ✓ Less security easy to extract information.
- ✓ Data Inconsistency
- ✓ Redundancy
- ✓ Sharing of information is cumbersome task
- ✓ Slow for huge database
- ✓ Searching process is time consuming

A relational database consists of a collection of
a) Tables b) Fields c) Records d) keys **Ans.: a**
Explanation: Fields are the column of the relation or tables. Records are each row in a relation. Keys are the constraints in a relation.

SQL term	Relational database term	Description
Row	**Tuple** or record	A data set representing a single item
Column	Attribute or **field**	A labeled element of a tuple, e.g. **Address** or **Date of birth**
Table	**Relation** or Base relvar	A set of tuples sharing the same attributes; a set of columns and rows
View or result set	Derived relvar	Any set of tuples; a data report from the RDBMS in response to a query

A _____ in a table represents a relationship among a set of values.
a) Column b) Key c) Row d) Entry **Ans.: c**
Explanation: Column has only one set of values. Keys are constraints and row is one whole set of attributes. Entry is just a piece of data.

The term _____ is used to refer to a row.
a) Attribute b) Tuple c) Field d) Instance **Ans.: b**
Explanation: Tuple is one entry of the relation with several attributes which are fields.

Database Management system (DBMS) comprise data in tabular form with rows and column. The rows are called -------- and columns are called-------- *[SBI-2008]*
a) Fields/Records b) Records/Fields **Ans.: b**
c)Fields/Ranges d) Records/Ranges

What represents a row in a relational database? *[Combined SO(IT/ICT)-2018]*
a) Variable b)tuple c) entity d)field **Ans.: b**

In database, a field is …… *[BREB-2016]*
a) Label b) Category of Information
c) Group of related records d) Table of information
Ans. c

The term attribute refers to a _____ of a table.
a) Record b) Column c) Tuple d) Key **Ans.: b**
Explanation: Attribute is a specific domain in the relation which has entries of all tuples.

For each attribute of a relation, there is a set of permitted values, called the _____ of that attribute.
a) Domain
b) Relation
c) Set
d) Schema

Ans.: a

Explanation: The values of the attribute should be present in the domain. Domain is a set of values permitted.

The tuples of the relations can be of _____ order.

a) Any
b) Same
c) Sorted
d) Constant

Ans.: a

Explanation: The values only count. The order of the tuples does not matter.

Key Point

Course(course_id,sec_id,semester) [Course is a table or relation]
Here the course_id,sec_id and semester are ---------and course is a ----------
Ans.: Attributes, Relation

In an Entity-Relationship many-to-many relationship corresponds to a- ---in actual database. *[JBL AEO(IT/ICT)-2015]*

a) Table b)field c) row d) primary key **Ans.:a**

Relational Model Concepts

- ✓ **Tables** – In the Relational model the, relations are saved in the table format. It is stored along with its entities. A table has two properties rows and columns. Rows represent records and columns represent attributes.
- ✓ **Attribute**: Each column in a table is called attributes. Attributes are the properties which define a relation. e.g.Student Rollno, NAME,etc.
- ✓ **Tuple** – It is nothing but a single row of a table, which contains a single record.
- ✓ **Relation Schema**: A relation schema represents the name of the relation with its attributes.
- ✓ **Degree**: The total number of attributes which in the relation is called the degree of the relation.
- ✓ **Cardinality**: Total number of rows present in the Table.
- ✓ **Column**: The column represents the set of values for a specific attribute.
- ✓ **Relation instance** – Relation instance is a finite set of tuples in the RDBMS system. Relation instances never have duplicate tuples.
- ✓ **Relation key** - Every row has one, two or multiple attributes, which is called relation key.
- ✓ **Attribute domain** – Every attribute has some pre-defined value and scope which is known as attribute domain

Which of the following is a group of one or more attributes that uniquely identifies a row? *[ICB(AP)-2017]*

a) Key b) Determinant c) Tuple d) Relation **Ans.: a**

Explanation:

What are the Keys?

A DBMS key is an attribute or set of an attribute which helps you to identify a row (tuple) in a relation (table). They allow you to find the relation between two tables. Keys help you uniquely identify a row in a table by a combination of one or more columns in that table.

Various Keys in Database Management System

DBMS has folwing seven types of Keys each have their different functionality:

- ✓ Super Key
- ✓ Primary Key
- ✓ Candidate Key
- ✓ Alternate Key
- ✓ Foreign Key
- ✓ Compound Key
- ✓ Composite Key
- ✓ Surrogate Key

Example: Let's see the STUDENT table

STUDENT

SID	FNAME	LNAME	COURSEID

Here in STUDENT table keys are:
Super key: SID, FNAME+LAME, FNAME+COURSEID, LNAME +LNAME
Candidate key: SID or FNAME+LAME
Primary Key: SID
Foreign Key: COURSEID
Alternate Key: FNAME+LAME
Composite Key: FNAME+LAME

Which one is an entity? *[Com(O-IT)-2020]*

a) Roll No.
b) Student
c) Passport No.
d) Department ID

Ans.: b

Which one of the following attribute can be taken as a primary key?

a) Name b) Street c) Id d) Department **Ans.: c**

Some important key point on database keys

- ✓ A DBMS key is an attribute or set of an attribute which helps you to identify a row(tuple) in a relation(table)
- ✓ DBMS keys allow you to establish a relationship between and identify the relation between tables
- ✓ A super key is a group of single or multiple keys which identifies rows in a table.

- ✓ A column or group of columns in a table which helps us to uniquely identifies every row in that table is called a primary key
- ✓ All the keys which are not primary key are called an alternate key
- ✓ A super key with no repeated attribute is called candidate key
- ✓ A compound key is a key which has many fields which allow you to uniquely recognize a specific record
- ✓ A key which has multiple attributes to uniquely identify rows in a table is called a composite key
- ✓ An artificial key which aims to uniquely identify each record is called a surrogate key
- ✓ Primary Key never accepts null values while a foreign key may accept multiple null values.

A primary key must also be ---------- *[Combined(IT/ICT)-2018]*

a) Foreign key b) Unique c) Identical d) Case sensitive **Ans.: b**

The subset of super key is a candidate key under what condition? *[Com(IT/ICT)-2018]* **Ans.: a**

a) No proper subset is a super key b) All subsets are super keys

c) Subset is a super key d) each subset is a super key

Explanation: The subset of a set cannot be the same set. Candidate key is a set from a super key which cannot be the whole of the super set.

Which one determines uniqueness of a Database Table? *[BPSC ANE-2019]*

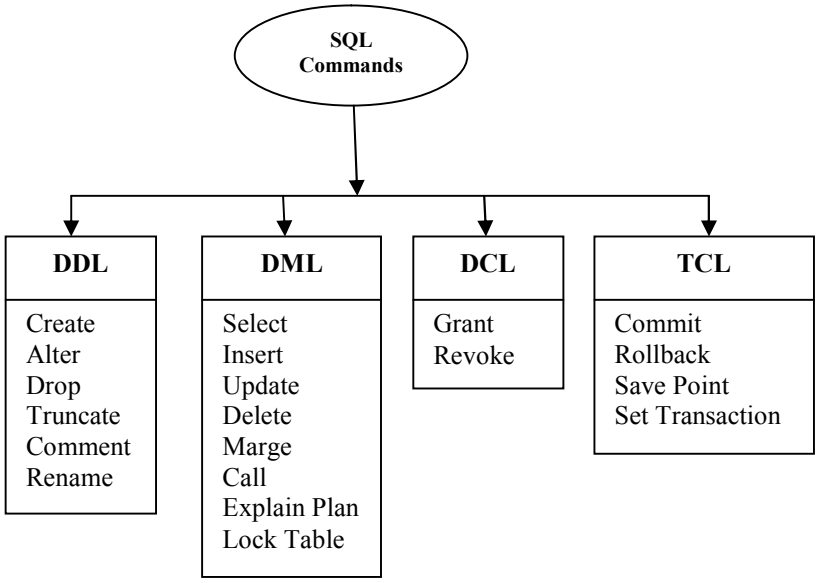
a) Primary Key b)Foreign Key c)Entity d)Relation **Ans. a**

Create table employee (name varchar,id integer). What type of statement is this? *[Combined (AP)-2018]*

a) DML b) DDL c) View d) Integrity constraint **Ans.: b**

The SQL statement that queries or reads data from a table is -- *[ICB(AP)-2017]*

a) SELECT b)READ c) QUERY d) None of the above **Ans.: a**



Which one is design language? *[BREB-2019]*
a)DDL b)DML c)Both a & b d)None **Ans.a**

DDL: Data Definition Language
All DDL commands are auto-committed. That means it saves all the changes permanently in the database.

Command	Description
create	to create new table or database
alter	for alteration
truncate	delete data from table
drop	to drop a table
rename	to rename a table

Create table employee (name varchar, id integer). What type of statement is this? *[Com(AP)-2018]*
a) DML b) DDL c) View d) Integrity constraint **Ans. b**

TCL: Transaction Control Language
These commands are to keep a check on other commands and their affect on the database. These commands can annul changes made by other commands by rolling back to original state. It can also make changes permanent.

Command	Description
commit	to permanently save
rollback	to undo change
savepoint	to save temporarily

DCL: Data Control Language
Data control language provides command to grant and take back authority.

Command	Description
grant	grant permission of right
revoke	Take back permission.

TCL stands for:
a) Transaction control languages b) Transaction command languages
c) Transaction connect languages d) None of the Mentioned
Ans.: a

A transaction completes its execution is said to be
a) Committed b) Aborted c) Rolled back d) Failed
Ans.: a
Explanation: A transaction the completes its execution is said to be Committed.

The database language that allows you to access or maintain data in a database
a) DCL b) DML c) DDL d) All of the Mentioned

Ans.: a

Explanation: DCL command like Grant and Revoke is used for to give access on the database.

A database language concerned with the definition of the whole database structure and schema is

a) DCL b) DML c) DDL d) All of the Mentioned

Ans.: c

Explanation: Data Definition Language is used for the to define the data structure of the Table.

Why do we need to normalize a database? *[Combined(AP)-2018]*

a) To remove redundancy b) To make data meaningful

c) To make database secure d) To make database consistency

Ans.:a

Database normalization is a database schema design technique, by which an existing schema is modified to minimize redundancy and dependency of data.

Normalization split a large table into smaller tables and define relationships between them to increases the clarity in organizing data.

Normalization Rule

Normalization rules are divided into the following normal forms:

- ✓ First Normal Form(1NF)
- ✓ Second Normal Form(2NF)
- ✓ Third Normal Form(3NF)
- ✓ BCNF
- ✓ Fourth Normal Form(4NF)

First Normal Form (1NF)

For a table to be in the First Normal Form, it should follow the following 4 rules:

1. It should only have single (atomic) valued attributes/columns.
2. Values stored in a column should be of the same domain
3. All the columns in a table should have unique names.
4. And the order in which data is stored, does not matter.

Second Normal Form (2NF)

For a table to be in the Second Normal Form,

1. It should be in the First Normal form.
2. And, it should not have **Partial Dependency**.

Third Normal Form (3NF)

A table is said to be in the Third Normal Form when,

1. It is in the Second Normal form.
2. And, it doesn't have **Transitive Dependency**.

Boyce and Codd Normal Form (BCNF)

Boyce and Codd Normal Form is a higher version of the Third Normal form. This form deals with certain type of anomaly that is not handled by 3NF. A 3NF table which does not have

multiple overlapping candidate keys is said to be in BCNF. For a table to be in BCNF, following conditions must be satisfied:

- ✓ R must be in 3rd Normal Form
- ✓ and, for each functional dependency (X → Y), X should be a super Key.

Fourth Normal Form (4NF)

A table is said to be in the Fourth Normal Form when,

1. It is in the Boyce-Codd Normal Form.
2. And, it doesn't have Multi-Valued Dependency.

Match the following

List-l	List-lI
A. 2 NF	1. Transitive dependencies eliminated
B. 3 NF	2. Multivalued attribute removed
C. 4NF	3. Contains no partial functional dependencies
D. 5 NF	4. Contains no join dependency

Ans.: A-3, B-1, C-2, D-4

Explanation

1 NF: must be atomic value
2 NF: Can not have partial functional dependency
3NF: can not have transitive dependencies
4 NF: deals with multivalued dependencies
5NF: deals with join dependencies.

Repeated data exist at-- *[BB(AP)-2016]*

a) unnormalized b) 1NF c) 2NF d) 3NF

Ans.:a

What is normalization? *[JBL AEO(IT)-2015]*

a) To Remove Redundancy b)To make Database

c) To make data meaningful d) To make database Consistency

Ans.: a

In the normal form, a composite attribute is----------converted to individual attributes. *[Combined(AP)-2018]*

a) First b) Second c) Third d) Fourth

Ans.:a

The table in the below violates the Normal Form(s). Which normal form it violates? *[Com (AP)-2020]*

Tournament	Year	Winer	WinerDOB
Indiana Inviation	1998	AI Fredrickson	21 july 1975
Cleveland Open	1999	Bob Albertion	28 sept 1966
Des Moin	1990	AI Fredrickson	21 july 1975

a) All of normal forms b) 3 NF c) 2 NF d) 1NF
Ans.: a

A table on the many side of a one to many or many to many relationship must:
a) Be in Second Normal Form (2NF) b) Be in Third Normal Form (3NF)
c) Have a single attribute key d) Have a composite key
Ans.: d
Explanation: The relation in second normal form is also in first normal form and no partial dependencies on any column in primary key.

Tables in second normal form (2NF):
a) Eliminate all hidden dependencies b) Eliminate the possibility of a insertion anomalies
c) Have a composite key d) Have all non key fields depend on the whole primary key
Ans.: a
Explanation: The relation in second normal form is also in first normal form and no partial dependencies on any column in primary key.

Which forms are based on the concept of functional dependency:
a) 1NF b) 2NF c) 3NF d) 4NF
Ans.: c

Which is a bottom-up approach to database design that design by examining the relationship between attributes:
a) Functional dependency b) Database modeling
c) Normalization d) Decomposition
Ans.: c
Explanation: Normalisation is the process of removing redundancy and unwanted data.

Which of the following gives a logical structure of the database graphically?
a) Entity-relationship diagram b) Entity diagram
c) Database diagram d) Architectural representation
Ans.: a
Explanation: E-R diagrams are simple and clear—qualities that may well account in large part for the widespread use of the E-R model.

ER- Diagram Notations
ER- Diagram is a visual representation of data that describe how data is related to each other.

- ✓ **Rectangles**: This symbol represent entity types
- ✓ **Ellipses** : Symbol represent attributes
- ✓ **Diamonds**: This symbol represents relationship types
- ✓ **Lines**: It links attributes to entity types and entity types with other relationship types
- ✓ **Primary key**: attributes are underlined
- ✓ **Double Ellipses**: Represent multi-valued attributes

The entity relationship set is represented in E-R diagram as
a) Double diamonds b) Undivided rectangles
c) Dashed lines d) Diamond

Ans.: d

Weak entity set is represented as

a) Underline b) Double line
c) Double diamond d) Double rectangle

Ans.: c

Explanation: An entity set that has a primary key is termed a strong entity set and don't have a primary key is called weak entity and represent as double diamond.

If you were collecting and storing information about your music collection, an album would be considered a(n) _____

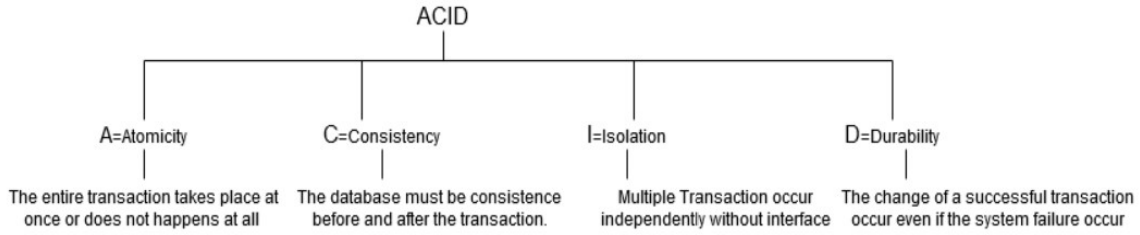
a) Relation b) Entity
c) Instance d) Attribute

Ans.: b

Which of the following is a property of transactions?

a) Atomicity b) Durability
c) Isolation d) All of the mentioned

Ans.: d



The "all-or-none" property is commonly referred to as _____

a) Isolation b) Durability
c) Atomicity d) None of the mentioned

Ans.: c

Which of the following systems is responsible for ensuring durability?

a) Recovery system b) Atomic system
c) Concurrency control system d) Compiler system

Ans.: a

Which of the following is not a transaction state?

a) Active b) Partially committed
c) Failed d) Compensated

Answer: d

Execution of translation in isolation preserves the _____ of a database

a) Atomicity b) Consistency
c) Durability d) All of the mentioned

Ans.: b

Which is the subset of SQL commands used to manipulate Oracle Database structures, including tables?

a) Data Definition Language(DDL) b) Data Manipulation Language(DML)
c) Both of above d) None
Ans.: a
Explanation:The Data Definition Language (DDL) is used to manage table and index structure. CREATE, ALTER, RENAME, DROP and TRUNCATE statements are the names of few data definition elements.

What is the full meaning of SQL? *[BREB-2016]*
a) Search and Query Language b) Simulation for Query Language
c) Standard Query Language d) Structured Query Language
Ans.:d

Which of the following is the original purpose of SQL?
a) To define the data structures
b) To specify the syntax and semantics of SQL data definition language
c) To specify the syntax and semantics of SQL manipulation language
d) All of the above.
Ans.: d

SQL can be used to:
a) create database structures only. b) query database data only.
c) modify database data only. d) All of the above can be done by SQL.
Ans.:d

The result of a SQL SELECT statement is a _____ . *[Com(AME) 2019]*
a) file b) report c) table d)form
Ans.:c

Which of the following do you need to consider when you make a table in SQL?
a) Data types b) Primary keys c) Default values d) All of the above.
Ans.: d

All of the following logical connectives are included in SQL except-- *[Com bank SO(IT/ICT)-2019]*
a)And b) or c) nor d) not
Ans.: c

Logical Operator: AND,OR,NOT

Special operators		
Operator	Description	Operates on
IN	The IN operator checks a value within a set of values separated by commas and retrieve the rows from the table which are matching....	Any set of values of the same datatype
BETWEEN	The SQL BETWEEN operator tests an expression against a range. The range consists of a beginning, followed by an AND keyword and an end expression....	Numeric, characters, or datetime values

ANY	ANY compares a value to each value in a list or results from a query and evaluates to true if the result of an inner query contains at least one row....	A value to a list or a single - columns set of values
ALL	ALL is used to select all records of a SELECT STATEMENT. It compares a value to every value in a list or results from a query. The ALL must be preceded by the comparison operators and evaluates to TRUE if the query returns no rows....	A value to a list or a single - columns set of values
SOME	SOME compare a value to each value in a list or results from a query and evaluate to true if the result of an inner query contains at least one row...	A value to a list or a single - columns set of values
EXISTS	The EXISTS checks the existence of a result of a subquery. The EXISTS subquery tests whether a subquery fetches at least one row. When no data is returned then this operator returns 'FALSE'...	Table

A major challenge in mixing SQL with a general-purpose language is mismatching in the ----*[PKB-(Programmer)-2019]*
a) Definition of data b) Manipulation of data
c) Execution of data d) Output of data
Ans.b

The SQL statement that queries or reads data from a table is – *[ICB (AP)-2017]*
a) SELECT b)READ c) QUERY d) None of the above
Ans. a

Which operator performs pattern matching?
a) BETWEEN operators b) LIKE operator
c) EXISTS operator d) None of these
Ans.:b
Explanation: LIKE is a keyword that is used in the WHERE clause. Basically, LIKE allows us to do a search based operation on a pattern rather than specifying exactly what is desired (as in IN) or spell out a range (as in BETWEEN).
The syntax is as follows:
SELECT "column_name" FROM "table_name"
WHERE "column_name" LIKE {PATTERN}
{PATTERN} often consists of wildcards. In SQL, there are two wildcards:

- ✓ 1=% (percent sign) represents zero, one, or more characters.
- ✓ 2=_ (underscore) represents exactly one character.

LIKE Operator	Description
WHERE CustomerName LIKE 'a%'	Finds any values that start with "a"
WHERE CustomerName LIKE '%a'	Finds any values that end with "a"
WHERE CustomerName LIKE '%or%'	Finds any values that have "or" in any position
WHERE CustomerName LIKE '_r%'	Finds any values that have "r" in the second position

Which SQL function is used to count the number of rows in a SQL query?
a) COUNT() b) NUMBER()
c) SUM() d) COUNT(*)
Ans.: d
Explanation: COUNT(*) takes null value row in to consideration.
The ISO standard defines five (5) aggregate functions namely;
- ✓ **AVG**():- Average of the column
- ✓ **COUNT**():- Number of records
- ✓ **MAX**():- maximum of the column
- ✓ **MIN**():- minimum of the column
- ✓ **SUM**():- Sum of the column

Which of the following group functions ignore NULL values?
a) MAX b) COUNT c) SUM d) All of the above
Ans.:d

_____removes all rows from a table without logging the individual row deletions.
a) DELETE b) REMOVE c) DROP d) TRUNCATE
Ans.: d
Explanation: TRUNCATE statement is a Data Definition Language (DDL) operation that marks the extents of a table for deallocation.

What operator tests column for the absence of data?
a) EXISTS operator b) NOT operator
c) IS NULL operator d) None of these
Ans.:c
Always use IS NULL to look for NULL values.
Syntax:
SELECT "column_name" FROM "table_name" WHERE "column_name" IS NULL

Which of the following is a valid SQL type?
a) CHARACTER b) NUMERIC
c) FLOAT d) All of the above
Ans.:d

NULL is
a) the same as 0 for integer b) the same as blank for character
c) the same as 0 for integer and blank for character d) not a value
Ans.:d

In SQL, which command(s) is(are) used to change a table's storage characteristics?
a) ALTER TABLE b) MODIFY TABLE
c) CHANGE TABLE d) All of the above
Ans.:a
To change the structure of the table we use ALTER TABLE.
Sytax:
ALTER TABLE "table_name" ADD "column_name" datatype
OR
ALTER TABLE "table_name" DROP COLUMN "column_name"

In SQL, the-------command is used to recompile a view. *[Com. Off(IT/ICT)-2019]*
a) COMPILE VIEW b) DEFINE VIEW c) ALTER VIEW d) CREATE VIEW
Ans. c

Which of the SQL statements is correct?
a)SELECT Username AND Password FROM Users
b) SELECT Username, Password FROM Users
c) SELECT Username, Password WHERE Username = 'user1'
d) None of these
Ans.:b
Correct order of SELECT, FROM and WHERE clause is as follow:
SELECT column_name1, column_name2, ... FROM table_name WHERE condition
Note : DISTINCT is use for remove repating data.

Summary
- ✓ The SQL WHERE clause is used to restrict the number of rows affected by a SELECT, UPDATE or DELETE query.
- ✓ The WHERE clause can be used in conjunction with logical operators such as AND and OR, comparison operators such as ,= etc.
- ✓ When used with the AND logical operator, all the criteria must be met.
- ✓ When used with the OR logical operator, any of the criteria must be met.
- ✓ The key word IN is used to select rows matching a list of values.

To remove the duplicate rows from the result of an SQL Select statement, the ------- qualifier specified include. *[Com. (AME) -2019]*
a)Only b) distinct c) Unique d) Single
Ans.: b
The SQL WHERE clause:
a) limits the row data are returned. b) limits the column data that are returned.
c) Both A and B are correct. d) Neither A nor B are correct.
Ans.:a

The HAVING clause does which of the following?
a) Acts EXACTLY like a WHERE clause.
b) Acts like a WHERE clause but is used for columns rather than groups.
c) Acts like a WHERE clause but is used for groups rather than rows.
d) Acts like a WHERE clause but is used for rows rather than columns.
Ans.: a

In SQL, aggregate functions can be used in the select list or the -------clause of a select Statement or subquery. They cannot be used in a--------clause. *[Com (AME) -2019]*

a) Where, having b) Having, where
c) Group by. Having d) Group by. Where
Ans.: b

Syntex:

```
SELECT column_name(s)
FROM table_name
WHERE condition
GROUP BY column_name(s)
HAVING condition
ORDER BY column_name(s);
```

SQL:
SELECT COUNT(CustomerID), Country FROM Customers **GROUP BY** Country **HAVING** COUNT(CustomerID) > 5;

Which SQL keyword is used to retrieve only unique values?

a) DISTINCTIVE b) UNIQUE
c) DISTINCT d) DIFFERENT
Ans.:c

A command that lets you change one or more fields in a record is

a) Insert b) Modify
c) Look-up d) All of the above
Ans.:b

Sometimes we need to change the data type of a column. To do this, we use the ALTER TABLE Modify Column command.

Sytax:
ALTER TABLE table_name **MODIFY** column_name "New Data Type"

SELECT SUBSTR('123456789', INSTR('abcabcabc', 'b'), 4) FROM DUAL;

a) 6789
b) 2345
c) 1234
d) 456789

Ans.:b

Explanation:

- ✓ **INSTR Function**:- The INSTR function in SQL is used to find the starting location of a pattern in a string. The syntax for the INSTR function is as follows:
- ✓ **INSTR** (*str*, *pattern*): Find the starting location of *pattern* in string *str*.
- ✓ **SUBSTR Function**:- The Substring function in SQL is used to grab a portion of the stored data. The syntax for the SUBSTR function is as follows:
- ✓ **SUBSTR(*str*,*pos*,*len*)**: Starting with the position *pos* in string *str* select the characters upto the length *len*. In the above query,
- ✓ **INSTR('abcabcabc', 'b')** outputs 2 as the starting location of pattern and 4 is length so start from 2 and total result = 2345 which is length 4

Which SQL keyword is used to sort the result-set?

a) SORT BY b) ORDER
c) ORDER BY d) SORT
Ans.:c

Table Employee has 10 records. It has a non-NULL SALARY column which is also UNIQUE. The SQL statement SELECT COUNT(*) FROM Employee WHERE SALARY > ANY (SELECT SALARY FROM EMPLOYEE); So result is..

a) 10 b) 9 c) 5 d) 0
Ans.:b

Note: ANY compares a value with each of the values in a list or results from a query and evaluates to true if the result of an inner query contains at least one row. ANY must be preceded by comparison operators (=, >, <, <=, >=, <>).

Employee table has 10 records and each value in non-NULL SALARY column is unique i.e different. So, in those 10 records one of the records will be minimum which cannot be greater than any nine value of the salary column. Hence the condition
WHERE SALARY > ANY (SELECT SALARY FROM employee) will be true nine times. So, the COUNT(*) outputs =9.

The SQL statement: SELECT ROUND(45.926, -1) FROM DUAL;

a) is illegal b) prints garbage c) prints 045.926 d) prints 50
Ans.: d

Find all the cities whose humidity is 89

a) SELECT city WHERE humidity = 89;
b) SELECT city FROM weather WHERE humidity = 89;
c) SELECT humidity = 89 FROM weather;
d) SELECT city FROM weather;
Ans.:b

Find the temperature in increasing order of all cities

a) SELECT city FROM weather ORDER BY temperature;
b) SELECT city, temperature FROM weather;
c) SELECT city, temperature FROM weather ORDER BY temperature;
d) SELECT city, temperature FROM weather ORDER BY city;
Ans.:c

Find the names of these cities with temperature and condition whose condition is neither sunny nor cloudy

a) SELECT city, temperature, condition FROM weather WHERE condition NOT IN ('sunny', 'cloudy');
b) SELECT city, temperature, condition FROM weather WHERE condition NOT BETWEEN ('sunny', 'cloudy');
c) SELECT city, temperature, condition FROM weather WHERE condition IN ('sunny', 'cloudy');
d) SELECT city, temperature, condition FROM weather WHERE condition BETWEEN ('sunny', 'cloudy');
Ans.:a

Find all the tuples having temperature greater than 'Paris'.

a) SELECT * FROM weather WHERE temperature > (SELECT temperature FROM weather WHERE city = 'Paris')
b) SELECT * FROM weather WHERE temperature > (SELECT * FROM weather WHERE city = 'Paris')
c) SELECT * FROM weather WHERE temperature > (SELECT city FROM weather WHERE city = 'Paris')
d) SELECT * FROM weather WHERE temperature > 'Paris' temperature
Ans.:a

Consider the following schemas :

Branch = (Branch-name, Assets, Branch-city)
Customer = (Customer-name, Bank_name, Customer-city)
Borrow = (Branch_name, loan_number, customer account_number)
Deposit = (Branch-name, Accountnumber,Customer_name, Balance)
Using relational Algebra, the Query that finds customers who have balance more than 10,000 is
a) $\pi_{customer\_name}$ ($\sigma_{balance}$ >10000(Deposit))
b) $\sigma_{customer\_name}$ ($\sigma_{balance}$ >10000(Deposit))
c) $\pi_{customer\_name}$ ($\sigma_{balance}$ >10000(Borrow))
d) $\sigma_{customer\_name}$ ($\pi_{balance}$ >10000(Borrow))
Ans.: a
Using relational algebra, the query that finds Customers who have balance more than 10,000 is:

(i) From deposit
(ii) Apply condition balance > 10,000
(iii) Project customer name

Therefore,
$\pi_{customer\_name}$ ($\sigma_{balance}$ >10000(Deposit))

Which one is not unary operation in relational algebra? *[Com(O-IT)-2020]*

a) Select b) Project c)Union d)Rename **Ans.:c**

The SELECT statement SELECT 'Hi' FROM DUAL WHERE NULL = NULL; Outputs

a) Hi b) FLASE c) TRUE d) Nothing
Ans.:d
Since **Null** is not a member of any data domain, it is not considered a "value", but rather a marker (or placeholder) indicating the absence the value. Because of this, comparisons with Null can never result in either True or False, but always in a third logical result, as Unknown. So, comparing NULL with NULL results to NULL.

Let the statement
SELECT column1 FROM myTable;
return 10 rows. The statement SELECT ALL column1 FROM myTable; Will return

a) less than 10 rows b) more than 10 rows

c) exactly 10 rows d) None of these

Ans.: c

ALL are optional. Its presence or absence doesn't change the output. Unlike DISTINCT, it allows duplicates in the output.

'AS' clause is used in SQL for

a) Selection operation. b) Rename operation.
c) Join operation. d) Projection operation.

Ans.:b

The **AS** command is used to rename a **column or table** with an alias. An alias only exists for the duration of the query.

..... Joins two or more tables based on a specified column value not equaling a specified column value in another table.

a) EQUIJOIN b) NON-EQUIJOIN
c) OUTER JOIN d) NATURAL JOIN

Ans.:b

Consider the following relation schema pertaining to a students database.

Student: (rollno, name, address)
Enroll: (rollno, courseno, coursename)

where the primary keys are shown underlined. The number of tuples in the Student and the Enroll tables are 120 and 8 respectively. **What are the maximum and the minimum number of tuples that can be present in (Student Enroll), where denotes natural join?**

a)8,8 b)120,8 c)960,8 d)960,120.

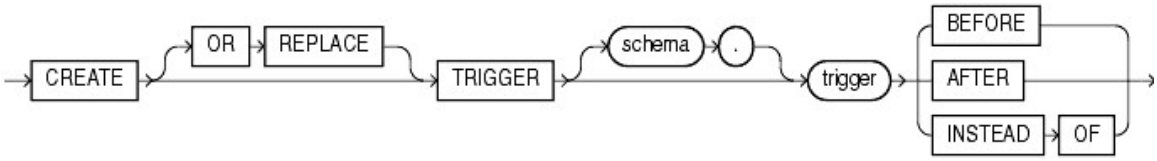
Ans.: d

The maximum number of tuples results when each of the 120 students enrolls for each of the 8 courses, giving 120 x 8 = 960 tuples. The minimum number of tuples results when all the 120 students enroll for the same course, giving 120 x 1 = 120 tuples.

Which of the following is an SQL trigger supported by Oracle? *[ICB (AP)-2017]*

a) BEFORE b)INSTEAD OF c) After d) All the above

Ans. d



Syntex:

```
create trigger [trigger_name]
[before | after]
{insert | update | delete}
on [table_name]
[for each row]
[trigger_body]
```

Trigger is special type of _____procedure.
a) Stored b) Function
c) View d) Table
Ans.: a
Explanation: Triggers are used to assess/evaluate data before or after data modification using DDL and DML statements.

How many types of triggers are present in SQL Server?
a) 4 b) 5
c) 8 d) 9
Ans.: a
Explanation: In Sql Server we can create four types of triggers Data Definition Language (DDL) triggers, Data Manipulation Language (DML) triggers, CLR triggers and Logon triggers.

AFTER trigger in SQL Server can be applied to _____
a) Table b) Views
c) Table and Views d) Function
Ans.: c
Explanation: AFTER trigger fires after SQL Server completes the execution of the action successfully that fired it.

Which of the following is not a typical trigger action?
a) Insert b) Select
c) Delete d) All of the mentioned
Ans.: b
Explanation: Valid trigger actions are INSERT, UPDATE and DELETE, or a combination of several, separated by commas.

The CREATE TRIGGER statement is used to create the trigger. THE _____ clause specifies the table name on which the trigger is to be attached. The _____ specifies that this is an AFTER INSERT trigger.
a)for insert, on b) On, for insert
c)For, insert d) Both a and c
Ans.: b
Explanation: On, for insert
The triggers run after an insert, update or delete on a table. They are not supported for views.

Which of the following is not a transaction state?
a) Active b) Partially committed
c) Failed d) Compensated
Ans.: d
Explanation: Compensated is not a transaction state. But active, partially committed and failed are different states of a transaction.

Execution of translation in isolation preserves the _____ of a database
a) Atomicity b) Consistency
c) Durability d) All of the mentioned
Ans.: b

Explanation: Execution of translation in isolation preserves the consistency of a database. It ensures that no other transaction is running concurrently.

RAID

RAID is a technology that is used to increase the performance and/or reliability of data storage. The abbreviation stands for either *Redundant Array of Independent Drives* or *Redundant Array of Inexpensive Disks*, which is older and less used. A RAID system consists of two or more drives working in parallel. These can be hard discs, but there is a trend to also use the technology for SSD (Solid State Drives). There are different RAID levels, each optimized for a specific situation.

- ✓ RAID 0 – striping
- ✓ RAID 1 – mirroring
- ✓ RAID 5 – striping with parity
- ✓ RAID 6 – striping with double parity
- ✓ RAID 10 – combining mirroring and striping

Which level of RAID refers to disk mirroring with block striping?

a) RAID level 1
b) RAID level 2
c) RAID level 0
d) RAID level 3

Ans.: a

Explanation: RAID level 1 refers to disk mirroring with block striping.

The RAID level which mirroring is done along with stripping is

a) RAID 1+0
b) RAID 0
c) RAID 2
d) Both RAID 1+0 and RAID 0

Ans.: d

Explanation: Mirroring without striping can also be used with arrays of disks, to give the appearance of a single large, reliable disk.

Where performance and reliability are both important, RAID level ____ is used.

a) 0
b) 1
c) 2
d) 0+1

Ans.: d

Explanation: Mirroring without striping can also be used with arrays of disks, to give the appearance of a single large, reliable disk.

What are the ways of dealing with deadlock?

a) Deadlock prevention

b) Deadlock recovery
c) Deadlock detection
d) All of the mentioned

Ans.: d
Explanation: Deadlock prevention is also called as deadlock recovery. Prevention is commonly used if the probability that the system would enter a deadlock state is relatively high; otherwise, detection and recovery are more efficient.

The deadlock in a set of a transaction can be determined by
a) Read-only graph
b) Wait graph
c) Wait-for graph
d) All of the mentioned

Ans.: a
Explanation: Each transaction involved in the cycle is said to be deadlocked.
The deadlock can be handled by
a) Removing the nodes that are deadlocked
b) Restarting the search after releasing the lock
c) Restarting the search without releasing the lock
d) Resuming the search

Ans.: b
Which one of the following is a failure to a system
a) Boot crash
b) Read failure
c) Transaction failure
d) All of the mentioned

Ans.: c
Explanation: Types of system failure are transaction failure, system crash and disk failure.
Which of the following belongs to transaction failure
a) Read error
b) Boot error
c) Logical error
d) All of the mentioned

Ans.: c
Explanation: Types of system transaction failure are logical and system error.

The method of access that uses key transformation is called as

a) Direct
b) Hash
c) Random
d) Sequential

Ans.: b

Explanation: Hash technique uses particular hash key value.

Which of the following causes system to crash

a) Bug in software
b) Loss of volatile data
c) Hardware malfunction
d) All of the mentioned

Ans.: d

Some Practices Question for M.C.Q:

☞ **What is DBMS?**

Database Management Systems (DBMS) are applications designed especially which enable user interaction with other applications.

☞ **What are the various kinds of interactions catered by DBMS?**

The various kind of interactions catered by DBMS are:

- ✓ Data definition
- ✓ Update
- ✓ Retrieval
- ✓ Administration

☞ **Who proposed the relational model?**

Edgar F. Codd proposed the relational model in 1970.

☞ **What do database languages do?**

As special-purpose languages, they have:

- ✓ Data definition language
- ✓ Data manipulation language
- ✓ Query language

☞ **Enlist the various relationships of database.**

The various relationships of database are:

- ✓ One-to-one: Single table having drawn relationship with another table having similar kind of columns.
- ✓ One-to-many: Two tables having primary and foreign key relation.
- ✓ Many-to-many: Junction table having many tables related to many tables.

☞ **Define cursor.**

A database object which helps in manipulating data row by row representing a result set is called cursor.

☞ **Define sub-query.**

A query contained by a query is called Sub-query.

☞ **Define Aggregate functions.**

Functions which operate against a collection of values and returning single value is called aggregate functions . Like max(), min(), count() etc.

☞ **Define Data Warehousing.**

Storage and access of data from the central location in order to take some strategic decision is called Data Warehousing. Enterprise management is used for managing the information whose framework is known as Data Warehousing.

☞ **Define Join and enlist its types.**

Joins help in explaining the relation between different tables. They also enable you to select data with relation to data in another table.

The various types are:

- INNER JOINs: Blank rows are left in the middle while more than equal to two tables are joined.
- OUTER JOINs: Divided into Left Outer Join and Right Outer Join. Blank rows are left at the specified side by joining tables in other side.

Other joins are CROSS JOINs, NATURAL JOINs, EQUI JOIN and NON-EQUI JOIN.

☞ **Database Architecture:**

Database Architecture is logically of two types:

- ✓ 2-tier DBMS architecture
- ✓ 3-tier DBMS architecture

☞ **What are the unary operations in Relational Algebra?**

PROJECTION and SELECTION are the unary operations in relational algebra. Unary operations are those operations which use single operands. Unary operations are SELECTION, PROJECTION, and RENAME. As in SELECTION relational operators are used for example - =,<=,>=, etc.

☞ **How many types of database languages are?**

There are four types of database languages**:** Data Definition Language (DDL), Data Manipulation Language (DML), DATA Control Language (DCL), Transaction Control Language (TCL)

☞ **What is the purpose of normalization in DBMS?**

Normalization is the process of analyzing the relational schemas which are based on their respective functional dependencies and the primary keys in order to fulfill certain properties.

The properties include:

- ✓ To minimize the redundancy of the data.
- ✓ To minimize the Insert, Delete and Update Anomalies.

What are the main differences between Primary key and Unique Key?

- ✓ The main difference between the Primary key and Unique key is that the Primary key can never have a null value while the Unique key may consist of null value.
- ✓ In each table, there can be only one primary key while there can be more than one unique key in a table.

What is the use of DROP command and what are the differences between DROP, TRUNCATE and DELETE commands?

- ✓ **DROP** command is a DDL command which is used to drop/delete the existing table, database, index or view from the database.

- ✓ **DROP** and **TRUNCATE** commands are the **DDL** commands which are used to delete tables from the database and once the table gets deleted, all the privileges and indexes that are related to the table also get deleted. These 2 operations cannot be rolled back and so should be used only when necessary.
- ✓ **DELETE** command, on the other hand, is a **DML** Command which is also used to delete rows from the table and this can be rolled back.
- ✓ **Note**: It is recommended to use the 'WHERE' clause along with the DELETE command else the complete table will get deleted from the database.

☞ **Explain Entity, Entity Type, and Entity Set in DBMS?**

- ✓ **Entity** is an object, place or thing which has its independent existence in the real world and about which data can be stored in a database. **For Example,** any person, book, etc.
- ✓ **Entity Type** is a collection of entities that have the same attributes. **For Example,** the STUDENT table contains rows in which each row is an entity holding the attributes like name, age, and id of the students, hence STUDENT is an Entity Type which holds the entities having the same attributes.
- ✓ **Entity Set** is a collection of entities of the same type. **For Example,** A collection of the employees of a firm.

☞ **What are the different levels of abstraction in the DBMS?**

There are 3 levels of data abstraction in the DBMS.

- ✓ **Physical Level:** This is the lowest level of the data abstraction which states how the data is stored in the database.
- ✓ **Logical Level:** This is the next level of the data abstraction which states the type of the data and the relationship among the data that is stored in the database.
- ✓ **View Level:** This is the highest level in the data abstraction which shows/states only a part of the database.

☞ **What integrity rules exist in the DBMS?**

There are 2 major integrity rules that exist in the DBMS.

- ✓ **Entity Integrity:** This states a very important rule that value of a Primary key can never have a NULL value.
- ✓ **Referential Integrity:** This rule is related to the Foreign key which states that either the value of a Foreign key is a NULL value or it should be the primary key of any other relation.

☞ **What is a functional dependency in the DBMS?**

- ✓ This is basically a constraint which is useful in describing the relationship among the different attributes in a relation.
- ✓ **Example:** If there is some relation 'R1' which has 2 attributes as Y and Z then the functional dependency among these 2 attributes can be shown as **Y->Z** which states that Z is functionally dependent on Y.

What are different types of joins in SQL?

There are 4 types of SQL Joins:

- ✓ **Inner Join:** This type of join is used to fetch the data among the tables which are common in both the tables.
- ✓ **Left Join:** This returns all the rows from the table which is on the left side of the join but only the matching rows from the table which is on the right side of the join.

- ✓ **Right Join:** This returns all the rows from the table which is on the right side of the join but only the matching rows from the table which is on the left side of the join.
- ✓ **Full Join:** This returns the rows from all the tables on which the join condition has put and the rows which do not match hold null values.

☞ **What is a degree of Relation?**

The degree of relation is a number of attribute of its relation schema. A degree of relation is also known as Cardinality it is defined as the number of occurrence of one entity which is connected to the number of occurrence of other entity. There are three degree of relation they are one-to-one(1:1), one-to-many(1:M), many-to-one(M:M).

What are the disadvantages of file processing systems?

- ✓ Inconsistent
- ✓ Not secure
- ✓ Data redundancy
- ✓ Difficult in accessing data
- ✓ Data isolation
- ✓ Data integrity
- ✓ Concurrent access is not possible
- ✓ Limited data sharing
- ✓ Atomicity problem

Do we consider NULL values the same as that of blank space or zero?

A NULL value is not at all same as that of zero or a blank space. The NULL value represents a value which is unavailable, unknown, assigned or not applicable whereas zero is a number and blank space is a character.

What do you understand by aggregation and atomicity?

Aggregation	**Atomicity**
This is a feature of the E-R model which allows a relationship set to participate in another relationship set.	This property states that a database modification must either follow all the rules or nothing at all. So, if one part of the transaction fails, then the entire transaction fails.