DBMS Programming Questions Part I

Q.1 **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.

Q2 **Explain Database partitioning and its importance.**

Data partitioning is the process of dividing a logical database into independent units for the betterment of availability, performance, and manageability.

The importance of database partitioning is as follows:

- Enables you to access large parts of a specific partition
- Cheap and slower storage can be used to store data
- Improves query performance

Q.3 **What is the difference between two and three-tier architectures?**

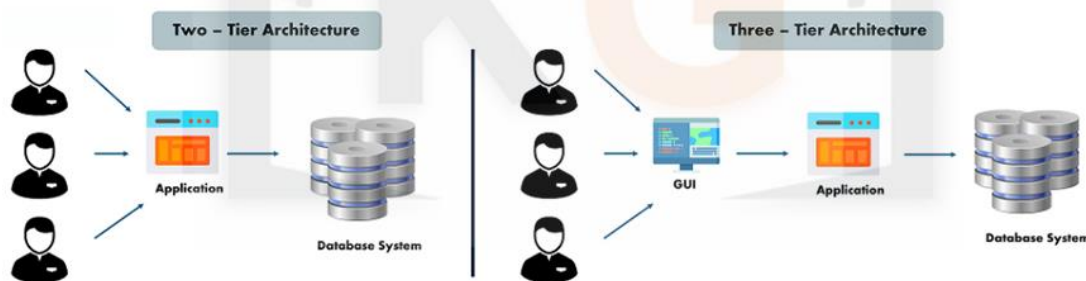| Two-tier architecture	Three-tier architecture
This is similar to the client-server architecture.	This architecture contains an extra layer between the client and the server.
Clients directly communicate with the database at the server-side	Clients communicate with an application(GUI) on the server-side, that makes the system more secure and accessible. This application thereafter communicates with the database system.

Fig 2: Two-Tier vs Three-Tier Architecture – DBMS Interview Questions

Q.4   **What are the different types of keys in the database?**

There are mainly 7 types of Keys, that can be considered in a database. I am going to consider the below tables to explain to you the various keys.

- **Candidate Key –** This is a set of attributes which can uniquely identify a table. Each table can have more than a candidate key. Apart from this, out of all the candidate keys, one key can be chosen as the Primary key. In the above example, since CustomerID and PanNumber can uniquely identify every tuple, they would be considered as a Candidate Key.
- **Super Key –** This is a set of attributes which can uniquely identify a tuple. So, a candidate key, primary key, and a unique key is a superkey, but vice-versa isn't true.
- **Primary Key –** This is a set of attributes which are used to uniquely identify every tuple. In the above example, since CustomerID and PanNumber are candidate keys, any one of them can be chosen as a Primary Key. Here CustomerID is chosen as the primary key.
- **Unique Key –** The unique key is similar to the primary key, but allows NULL values in the column. Here the PanNumber can be considered as a unique key.
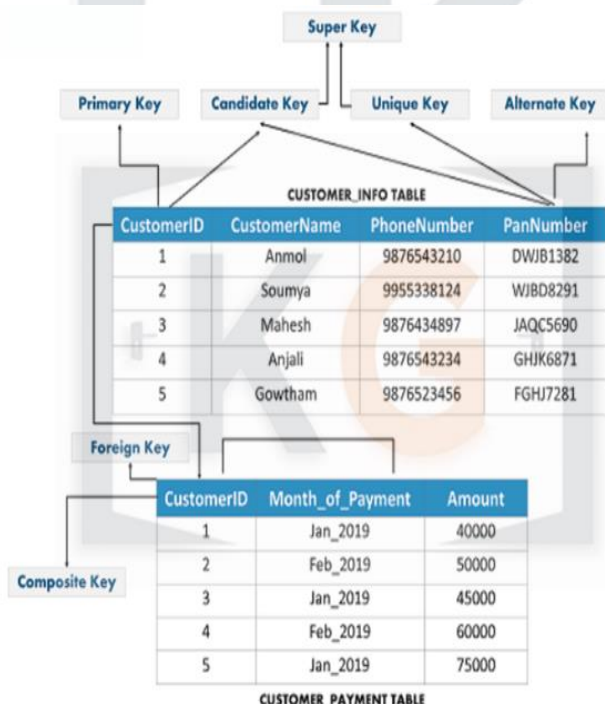
- **Alternate Key –** Alternate Keys are the candidate keys, which are not chosen as a Primary key. From the above example, the alternate key is PanNumber
- **Foreign Key –** An attribute that can only take the values present as the values of some other attribute, is the foreign key to the attribute to which it refers. in the above example, the CustomerID from the Customers Table is referred to the CustomerID from the Customer_Payment Table.
- **Composite Key –** A composite key is a combination of two or more columns that identify each tuple uniquely. Here, the CustomerID and Date_of_Payment can be grouped together to uniquely identify every tuple in the table.

Super Key

Primary Key   Candidate Key   Unique Key   Alternate Key

CUSTOMER_INFO TABLE

CustomerID	CustomerName	PhoneNumber	PanNumber
1	Anmol	9876543210	DWJB1382
2	Soumya	9955338124	WJBD8291
3	Mahesh	9876434897	JAQC5690
4	Anjali	9876543234	GHJK6871
5	Gowtham	9876523456	FGHJ7281

Foreign Key

Composite Key

CustomerID	Month_of_Payment	Amount
1	Jan_2019	40000
2	Feb_2019	50000
3	Jan_2019	45000
4	Feb_2019	60000
5	Jan_2019	75000

CUSTOMER_PAYMENT TABLE

Q.5 **What is a checkpoint in DBMS and when does it occur?**

A checkpoint is a mechanism where all the previous logs are removed from the system and are permanently stored on the storage disk. So, basically, checkpoints are those points from where the transaction log record can be used to recover all the committed data up to the point of crash.

Q.**6 What do you understand by cursor? Mention the different types of cursor**

A cursor is a database object which helps in manipulating data, row by row and represents a result set.

The types of cursor are as follows:

- **Implicit cursor:** This type of cursor is declared automatically as soon as the execution of SQL takes place. Here, the user is not indicated about the declaration of the cursor.
- **Explicit cursor:** This type of cursor is defined by the PL/ SQL, as it handles a query in more than a single row.

Q7. **What do you understand by Proactive, Retroactive and Simultaneous Update?**

- **Proactive Update:** These updates are applied to the database before it becomes effective in the real-world environment.
- **Retroactive Update:** These retroactive updates are applied to a database after it becomes effective in the real-world environment.
- **Simultaneous Update:** These updates are applied to the database at the same instance of time as it becomes effective in a real-world environment.

Q8   **What are the different integrity rules present in the DBMS?**

The different integrity rules present in DBMS are as follows:

- **Entity Integrity:** This rule states that the value of the primary key can never be NULL. So, all the tuples in the column identified as the primary key should have a value.
- **Referential Integrity:** This rule states that either the value of the foreign key is NULL or it should be the primary key of any other relation.

Q9 . What do you understand by CLAUSE in SQL?

CLAUSE in SQL is used to limit the result set by mentioning a condition to the query. So, you can use a CLAUSE to filter rows from the entire set of records.

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Q10. What are the different types of garbage collectors in Java?

Garbage collection in Java a program which helps in implicit memory management. Since in Java, using the new keyword you can create objects dynamically, which once created will consume some memory. Once the job is done and there are no more references left to the object, Java using garbage collection destroys the object and relieves the memory occupied by it. Java provides four types of garbage collectors:

- Serial Garbage Collector
- Parallel Garbage Collector
- CMS Garbage Collector
- G1 Garbage Collector

Q11. What are the differences between DROP, TRUNCATE and DELETE commands?

DROP	TRUNCATE	DELETE
Used to delete a database, table or a view	Used to delete all rows from a table	Used to delete a row in the table
Data cannot be rollbacked	Data cannot be rollbacked	Data can be rollbacked
A DDL command	A DDL command	A DML command.
Slower than TRUNCATE	Faster than DROP and DELETE	Slower than TRUNCATE
Deletes the full structure of the table	Preserves the structure of the table	Deletes the structure of the row from a table