**DBMS Interview Questions-DBMS Interview Questions**

**1. What is database?**

A database is a collection of information that is organized. So that it can easily be accessed, managed, and updated.

**2. What is DBMS?**

DBMS stands for Database Management System. It is a collection of programs that enables user to create and maintain a database.

**3. What is a Database system?**

The database and DBMS software together is called as Database system.

**4.   What are the advantages of DBMS?**

I.  Redundancy is controlled.

II. Providing multiple user interfaces.

III. Providing backup and recovery

IV. Unauthorized access is restricted.

V.  Enforcing integrity constraints.

**5. What is normalization?**

It is a process of analysing the given relation schemas based on their Functional Dependencies (FDs) and primary key to achieve the properties  
(1).Minimizing redundancy, (2). Minimizing insertion, deletion and update anomalies.

**6. What is Data Model?**  
A collection of conceptual tools for describing data, data relationships data semantics and constraints.

**7. What is E-R model?**

This data model is based on real world that consists of basic objects called entities and of relationship among these objects. Entities are described in a database by a set of attributes.

**9. What is an Entity?**  
An entity is a thing or object of importance about which data must be captured.

**10. What is DDL (Data Definition Language)?**

A data base schema is specifies by a set of definitions expressed by a special language called DDL.

**11. What is DML (Data Manipulation Language)?**

This language that enable user to access or manipulate data as organized by appropriate data model. Procedural DML or Low level: DML requires a user to specify what data are needed and how to get those data. Non-Procedural DML or High level: DML requires a user to specify what data are needed without specifying how to get those data.

**14. What is Functional Dependency?**

Functional Dependency is the starting point of normalization. Functional Dependency exists when a relation between two attributes allows you to uniquely determine the corresponding attributes value.

**15. What is 1 NF (Normal Form)?**

The first normal form or 1NF is the first and the simplest type of normalization that can be implemented in a database. The main aims of 1NF are to:

1. Eliminate duplicative columns from the same table.

2. Create separate tables for each group of related data and identify each row with a unique column (the primary key).

**16. What is Fully Functional dependency?**

A functional dependency X Y is fully functional dependency

if removal of any attribute A from X means that the dependency does not hold any more.

First Normal Form

Disallows

Composite attributes

Multivalued attributes

Nested relations: attributes whose values for an individual tuple are non-atomic

**17. What is 2NF?**

A relation schema R is in 2NF if it is in 1NF and every non-prime attribute A in R is fully functionally dependent on primary key.

**18. What is 3NF?**

A relation is in third normal form if it is in Second Normal Form and there are no functional (transitive) dependencies between two (or more) non-primary key attributes.

**19. What is BCNF (Boyce-Codd Normal Form)?**

A table is in Boyce-Codd normal form (BCNF) if and only if it is in 3NF and every determinant is a candidate key.

**22. What is a query?**

A query with respect to DBMS relates to user commands that are used to interact with a data base.

**23. What is meant by query optimization?**

The phase that identifies an efficient execution plan for evaluating a query that has the least estimated cost is referred to as query optimization.

**24. What is an attribute?**  
It is a particular property, which describes the entity.

**25. What is RDBMS?**

Relational Data Base Management Systems (RDBMS) are database management systems that maintain data records and indices in tables.

**26. Whats difference between DBMS and RDBMS?**

DBMS provides a systematic and organized way of storing, managing and retrieving from collection of logically related information. RDBMS also provides what DBMS provides but above that it provides relationship integrity.

**27. What is SQL?**

SQL stands for Structured Query Language. SQL is an ANSI (American National Standards Institute) standard computer language for accessing and manipulating database systems. SQL statements are used to retrieve and update data in a database.

**28. What is Stored Procedure?**

A stored procedure is a named group of SQL statements that have been previously created and stored in the server database.

**29. What is a view?**

A view may be a subset of the database or it may contain virtual data that is derived from the database files but is not explicitly stored.

**30. What is Trigger?**

A trigger is a SQL procedure that initiates an action when an event (INSERT, DELETE or UPDATE) occurs.

**31. What is Index?**

An index is a physical structure containing pointers to the data.

**32. What is extension and intension?**

Extension -It is the number of tuples present in a table at any instance. This is time dependent.

Intension -It is a constant value that gives the name, structure of table and the constraints laid on it.

**33. What do you mean by atomicity and aggregation?**

Atomicity-Atomicity states that database modifications must follow an all or nothing rule. Each transaction is said to be atomic. If one part   of the transaction fails, the entire transaction fails.

Aggregation - A feature of the entity relationship model that allows a relationship set to participate in another relationship set. This is indicated on an ER diagram by drawing a dashed box around the aggregation.

**37. Disadvantage in File Processing System?**

·        Data redundancy & inconsistency.

·        Difficult in accessing data.

·        Data isolation.

·        Data integrity.

·        Concurrent access is not possible.

·        Security Problems.

**40. Describe concurrency control?**

Concurrency control is the process managing simultaneous operations against a database so that database integrity is no compromised. There are two approaches to concurrency control.

The pessimistic approach involves locking and the optimistic approach involves versioning.

**42. What is a distributed database?**

A distributed database is a single logical database that is spread across more than one node or locations that are all connected via some communication link.

**43. Explain the difference between two and three-tier architectures?**

Three-tier architecture includes a client and two server layers.

The   application code is stored on the application server and the database   is stored on the database server. A two-tier architecture includes a client and one server layer. The database is stored on the database server.

1-Tier Architecture is the simplest, single tier on single user, and is the equivalent of running an application on a personal computer. All the required component to run the application are located within it. User interface, business logic, and data storage are all located on the same machine. They are the easiest to design, but the least scalable. Because they are not part of a network, they are useless for designing web applications.

2-Tier Architectures supply a basic network between a client and a server. For example, the basic web model is a 2-Tier Architecture. A web browser makes a request from a web server, which then processes the request and returns the desired response, in this case, web pages. This approach improves scalability and divides the user interface from the data layers. However, it does not divide application layers so they can be utilized separately. This makes them difficult to update and not specialized. The entire application must be updated because layers aren’t separated.

3-Tier Architecture is most commonly used to build web applications. In this model, the browser acts like a client, middleware or an application server contains the business logic, and database servers handle data functions. This approach separates business logic from display and data.So the 3 layers commonly known as: Presentation Layer(PL/UI),Business Logic Layer(BLL) & Data Access Layer(DAL).

1 tier - user+application server+database server  
2 tier - user , application server+database server  
3 tier - user, application server , database server  
  
In one tier the user,application and database server are present in one machine.  
In two tier the user is in one machine,and remaining are in the other machine.  
In three tier three are in different machines

**44. Briefly describe the three types of SQL commands?**

Data definition language commands are used to create, alter, and drop tables. Data manipulation commands are used to insert, modify, update, and query data in the database. Data control language commands help the DBA to control the database.

**47. What is SQL Deadlock?**

Deadlock is a unique situation in a multi user system that causes two or more users to wait indefinitely for a locked resource.

**48. What is a Catalog?**

A catalog is a table that contains the information such as structure of each file, the type and storage format of each data item and various constraints on the data .The information stored in the catalog is called Metadata.

**49. What is data ware housing & OLAP?**

Data warehousing and OLAP (online analytical processing) systems are the techniques used in many companies to extract and analyze useful  information from very large databases for decision making .

**50. Describe the three levels of data abstraction?**

Physical level: The lowest level of abstraction describes how data are stored.

Logical level: The next higher level of abstraction, describes what data are stored in database and what relationship among those data.

View level: The highest level of abstraction describes only part of entire database.

**51. What is Data Independence?**

Data independence means that the application is independent of the storage structure and access strategy of data.

**53. What is order by clause?**

ORDER BY clause helps to sort the data in either ascending order to descending

**56. What is difference between DELETE & TRUNCATE commands?**

Delete command removes the rows from a table based on the condition that we provide with a WHERE clause. Truncate will actually remove all the rows from a table and there will be no data in the table after we run the truncate command.

**57. What is Hashing technique?**

This is a primary file organization technique that provides very fast access to records on certain search conditions.

**58. What is a transaction?**

A transaction is a logical unit of database processing that includes one or more database access operations.

**59. What are the different phases of Transaction?**

Analysis phase

Redo phase

Undo phase

**62. Explain the differences between structured data and unstructured data.**

Structured data are facts concerning objects and events. The most important structured data are numeric, character, and dates.

Structured data are stored in tabular form. Unstructured data are multimedia data such as documents, photographs, maps, images, sound, and video clips. Unstructured data are most commonly found on Web servers and Web-enabled databases.

**63. What are the major functions of the database administrator?**

Managing database structure, controlling concurrent processing, managing processing rights and responsibilities, developing database security, providing for database recovery, managing the DBMS and maintaining the data repository.

**65. Explain the difference between an exclusive lock and a shared lock?**

An exclusive lock prohibits other users from reading the locked resource; a shared lock allows other users to read the locked resource, but they cannot update it.

**67. Name four applications for triggers.**

(1)Providing default values, (2) enforcing data constraints,

(3) Updating views and (4) enforcing referential integrity

**68. What are the advantages of using stored procedures?**

The advantages of stored procedures are (1) greater security, (2) decreased network traffic, (3) the fact that SQL can be optimized and (4) code sharing which leads to less work, standardized processing, and specialization among developers.

**69. Explain the difference between attributes and identifiers.**

Entities have attributes. Attributes are properties that describe the entity's characteristics. Entity instances have identifiers. Identifiers are attributes that name, or identify, entity instances.

**70. What is Enterprise Resource Planning (ERP), and what kind of a database is used in an ERP application?**

Enterprise Resource Planning (ERP) is an information system used in manufacturing companies and includes sales, inventory, production planning, purchasing and other business functions. An ERP system typically uses a multiuser database.

**72. Explain a join between tables**

A join allows tables to be linked to other tables when a relationship between the tables exists. The relationships are established by using a common column in the tables and often uses the primary/foreign key relationship.

**73. Describe a subquery**.

A subquery is a query that is composed of two queries. The first query (inner query) is within the WHERE clause of the other query  (outer query).

**76. Explain what needs to happen to convert a relation to third normal form.**

First you must verify that a relation is in both first normal form and second normal form. If the relation is not, you must convert into second normal form. After a relation is in second normal form, you must remove all transitive dependencies.

**78. Explain minimum and maximum cardinality?**

Minimum cardinality is the minimum number of instances of an entity that can be associated with each instance of another entity.  Maximum cardinality is the maximum number of instances of an entity that can be associated with each instance of another entity.

**79. What is deadlock? How can it be avoided? How can it be resolved once it occurs?**

Deadlock occurs when two transactions are each waiting on a resource that the other transaction holds. Deadlock can be prevented by requiring transactions to acquire all locks at the same time; once it occurs, the only way to cure it is to abort one of the transactions and back out of partially completed work.

**80. Explain what we mean by an ACID transaction.**

An ACID transaction is one that is atomic, consistent, isolated, and durable. Durable means that database changes are permanent. Consistency can mean either statement level or transaction level consistency. With transaction level consistency, a transaction may not see its own changes.Atomic means it is performed as a unit.

**81. Under what conditions indexes should be used?**

Indexes can be created to enforce uniqueness, to facilitate sorting, and to enable fast retrieval by column values. A good candidate for an index is a column that is frequently used with equal conditions in WHERE clauses.

**82. What is difference between SQL and SQL SERVER?**

SQL is a language that provides an interface to RDBMS, developed by IBM. SQL SERVER is a RDBMS just like Oracle, DB2.

**83. What is Specialization?**

It is the process of defining a set of subclasses of an entity type where each subclass contain all the attributes and relationships of the parent entity and may have additional attributes and relationships which are specific to itself.

**84. What is generalization?**

It is the process of finding common attributes and relations of a number of entities and defining a common super class for them.

**87. What are serial, non serial schedule?**

A schedule S is serial if, for every transaction T participating in the schedule, all the operations of T is executed consecutively in the schedule, otherwise, the schedule is called non-serial schedule.

**88. What are conflict serializable schedules?**

A schedule S of n transactions is serializable if it is equivalent to some serial schedule of the same n transactions.

**89. What is view serializable?**

A schedule is said to be view serializable if it is view equivalent with some serial schedule.

**90. What is a foreign key?**

A key of a relation schema is called as a foreign key if it is the primary key of  
some other relation to which it is related to.

**91. What are the disadvantages of using a dbms?**

1) High initial investments in h/w, s/w, and training.  
2) Generality that a DBMS provides for defining and processing data.  
3) Overhead for providing security, concurrency control, recovery, and integrity functions.

**93. What is a Phantom Deadlock?**  
In distributed deadlock detection, the delay in propagating local information might cause the deadlock detection algorithms to identify deadlocks that do not really exist. Such situations are called phantom deadlocks and they lead to unnecessary aborts.

**95. What is schema?**  
The description of a data base is called the database schema , which is specified during database design and is not expected to change frequently . A displayed schema is called schema diagram .We call each object in the schema as schema construct.