VIVA QUESTIONS WITH ANSWERS

UNIT-1

1. What is database?

A database is a logically coherent collection of data with some inherent meaning, representing some aspect of real world and which is designed, built and populated with data for a specific purpose.

2. What is DBMS?
It is a collection of programs that enables user to create and maintain a database. In other words it is general-purpose software that provides the users with the processes of defining, constructing and manipulating the database for various applications.

3. What is a Database system?
The database and DBMS software together is called as Database system.

4. Advantages of DBMS?
- Redundancy is controlled.
- Unauthorized access is restricted.
- Providing multiple user interfaces.
- Enforcing integrity constraints.
- Providing backup and recovery.

5. Disadvantage in File Processing System?
- Data redundancy & inconsistency.
- Difficult in accessing data.
- Data isolation.
- Data integrity.
- Concurrent access is not possible.
- Security Problems.

6. Describe the three levels of data abstraction?
Three levels of 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.

7. Define the "integrity rules"
There are two Integrity rules.
Entity Integrity: States that Primary key cannot have NULL value
Referential Integrity: States that Foreign Key can be either a NULL value or should be Primary Key value of other relation.

8. 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.

9. What is Data Independence?
Data independence means that "The application is independent of the storage structure and access strategy of data". In other words, the ability to modify the schema definition in one level should not affect the schema definition in the next higher level.
Two types of Data Independence:
Physical Data Independence: Modification in physical level should not affect the logical level.
Logical Data Independence: Modification in logical level should affect the view level.

10. What is a view? How it is related to data independence?
A view may be thought of as a virtual table, that is, a table that does not really exist in its own right but is instead derived from one or more underlying base table. In other words, there is no stored file that direct represents the view instead a definition of view is stored in data dictionary. Growth and restructuring of base tables is not reflected in views. Thus the
View can insulate users from the effects of restructuring and growth in the database. Hence accounts for logical data independence.

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

12. 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.

13. What is Object Oriented model?
This model is based on collection of objects. An object contains values stored in instance variables within the object. An object also contains bodies of code that operate on the object. These bodies of code are called methods. Objects that contain same types of values and the same methods are grouped together into classes.

14. What is an Entity?
It is a 'thing' in the real world with an independent existence.

15. What is an Entity type?
It is a collection (set) of entities that have same attributes.

16. What is an Entity set?
It is a collection of all entities of particular entity type in the database.

17. What is an Extension of entity type?
The collections of entities of a particular entity type are grouped together into an entity set.

18. What is Weak Entity set?
An entity set may not have sufficient attributes to form a primary key, and its primary key compromises of its partial key and primary key of its parent entity, then it is said to be Weak Entity set.

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

20. What is a Relation?
A relation is defined as a set of tuples.

21. What is degree of a Relation?
It is the number of attribute of its relation schema.

22. What is Relationship?
It is an association among two or more entities.

23. What is Relationship set?
The collection (or set) of similar relationships.

24. What is Relationship type?
Relationship type defines a set of associations or a relationship set among a given set of entity types.

25. What is degree of Relationship type?
It is the number of entity type participating.

UNIT-2

1. What is DDL (Data Definition Language)?
A data base schema is specifies by a set of definitions expressed by a special language called DDL.

2. What is VDL (View Definition Language)?
It specifies user views and their mappings to the conceptual schema.

3. What is DML (Data Manipulation Language)?
This language that enable user to access or manipulate data as organized by appropriate data model.

4. What is DML Compiler?
It translates DML statements in a query language into low-level instruction that the query evaluation engine can understand.

5. What is Query evaluation engine?
It executes low-level instruction generated by compiler.

6. What is DDL Interpreter?
It interprets DDL statements and records them in tables containing metadata.

7. What is a query?
A query with respect to DBMS relates to user commands that are used to interact with a data base. The query language can be classified into data definition language and data manipulation language.

8. What do you mean by Correlated sub query?
A correlated sub query can be easily identified if it contains any references to the parent sub query columns in its WHERE clause. Columns from the sub query cannot be referenced anywhere else in the parent query.

9. Are the resulting relations of PRODUCT and JOIN operation the same?
No.
PRODUCT: Concatenation of every row in one relation with every row in another.
JOIN: Concatenation of rows from one relation and related rows from another.

10. What is database Trigger?
A database trigger is a PL/SQL block that can defined to automatically execute for insert, update, and delete statements against a table. The trigger can be defined to execute once for the entire statement or once for every row that is inserted, updated, or deleted. For any one table, there are twelve events for which you can define database triggers. A database trigger can call database procedures that are also written in PL/SQL.

11. What are stored-procedures? What are the advantages of using them?
Stored procedures are database objects that perform a user defined operation. A stored procedure can have a set of compound SQL statements. A stored procedure executes the SQL commands and returns the result tothe client. Stored procedures are used to reduce network traffic.

12. Define super key and give example to illustrate the super key?
Set of one or more attributes taken collectively, allowing to identify uniquely an entity in the entity set.Eg1. {SSN} and {SSN, Cust_name} of customer table are super keys.Eg2. {Branch name} and {Branch name, Branch city} of Branch table re super keys.

13. Define candidate key and give example to illustrate the candidate key?

Super keys with no proper subset are called the candidate keys. Otherwise it is called minimal super key. Candidate key is nothing but the primary key used in SQL. Eg1. {SSN} is the candidate keyfor the super keys {SSN} and {SSN, Cust_name} of customer table.Eg2. {Branch name} is the candidate key for the

super keys {Branch name} and {Branch name, Branch city} of Branch table.

14. What is Primary key?

A key chosen to act as the means by which to identify tuples in a relation.

15. What is foreign key?

A foreign key of relation R is a set of its attributes intended to be used (by each tuple in R) for identifying/referring to a tuples in some relation S. (R is called the referencing relation and S the referenced relation.) For this to make sense, the set of attributes of R forming the foreign key should "correspond to" some superkey of S. Indeed, by definition we require this superkey to be the primary keyof S.

14. What is a Cursor?

A cursor is a pointer to this context area. PL/SQL controls the context area through a cursor. A cursor holds the rows (one or more) returned by a SQL statement. The set of rows the cursor holds is referred toas the active set.

UNIT-3

1. What is normalization?

It is a process of analyzing the given relation schemas based on their Functional Dependencies (FDs) and primary key to achieve the properties

- Minimizing redundancy
- Minimizing insertion, deletion and update anomalies.

2. What is Functional Dependency?

A Functional dependency is denoted by X-> Y between two sets of attributes X and Y that are subsets of R specifies a constraint on the possible tuples that can form a relation state r of R. The constraint is for any two tuples t1 and t2 in r if t1[X] = t2[X] then they have t1[Y] = t2[Y].

3. What is 1 NF (Normal Form)?

The domain of attribute must include only atomic (simple, indivisible) values.

4. What is Fully Functional dependency?

It is based on concept of full 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.

5. 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.

6. What is 3NF?

A relation schema R is in 3NF if it is in 2NF and for every FD X A either of the following is true
X is a Super-key of R.
A is a prime attribute of R.
In other words, if every non prime attribute is non-transitively dependent on primary key.

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

A relation schema R is in BCNF if it is in 3NF and satisfies an additional constraint that for every FD X A, X must be a candidate key.

8. What is 4NF?

A relation schema R is said to be in 4NF if for every multivalued dependency X Y that holds over R, one of following is true X is subset or equal to (or) XY = R. X is a super key.

9. What is 5NF?

A Relation schema R is said to be 5NF if for every join dependency {R1, R2... Rn} that holds R, one the following is true

i) Ri = R for some i.

ii) The join dependency is implied by the set of FD, over R in which the left side is key of R.

10.What is dependency preservation?

Dependency Preservation Property enables us to enforce a constraint on the original relation from corresponding instances in the smaller relations.

11. What is Lossless join property?

Lossless join property enables us to find any instance of the original relation from corresponding instances in the smaller relations

12. What are Multivalued dependencies?

A multivalued dependency (MVD) X ->->Y specified on R, where X, and Y are both subsets of R and Z = (R – (X Y)) specifies the following restrictions on r(R)

t3[X]=t4[X]=t1[X]=t2[X]

t3[Y] = t1[Y] and t4[Y] = t2[Y]

t3[Z] = t2[Z] and t4[Z] = t1 [Z]

UNIT-4

1. What is a transaction?
A transaction is a logical unit of database processing that includes one or more database access operations (e.g., insertion, deletion, modification, or retrieval operations).

2. List the ACID properties?
a) Atomicity b) Consistency c) Isolation d) Durability

3. What is Atomicity?
A transaction is an atomic unit of processing; it is either performed in its entirety or not performed at all.

4. What is Consistency?
A transaction is consistency preserving if its complete execution take(s) the database from one consistent state to another.

5. What is Isolation?
A transaction should appear as though it is being executed in isolation from other transactions. That is, the execution of a transaction should not be interfered with by any other transactions executing concurrently.

6. What is Durability?
The changes applied to the database by a committed transaction must persist in the database. These changes must not be lost because of any failure.

7. When two operations in a Schedule Rollbacks?
Two operations in a schedule are said to conflict if they satisfy all three of the following
Conditions:
1. They belong to different transactions;
2. They access the same item X; and
3. At least one of the operations is a write_item(X).

8. Define recoverable schedule.
Recoverable schedule is the one where for each pair of transactions Ti and Tj such that Tj reads a data item previously written by Ti, the commit operation of Ti appears before the commit operation of Tj.

9. What is a checkpoint and when does it occur?
A Checkpoint is like a snapshot of the DBMS state. By taking checkpoints, the DBMS can reduce the amount of work to be done during restart in the event of subsequent crashes.

10. What is blind write?
If a transaction writes a data item without reading the data is called blind write. This sometimes causes inconsistency.

11. Define serial schedule?
A schedule, S is serial if for every transaction T participating in the schedule and all the operations of T is executed consecutively in the schedule; otherwise the schedule is called Non-serial schedule.

12. What is the use of locking?
It is used to prevent concurrent transactions from interfering with one another and enforcing an additional condition that guarantees serializability.

UNIT-5

1. What is indexing?

Indexing is a technique for determining how quickly specific data can be found.

2. What is dense index?
If there is an index entry for every data record.

3. What is sparse index?
If there is an index entry for subset of data records.

4. What is primary index?
If there is a key, ordering field then it is primary index.

5. What is clustering index?
If there is non-key, ordering field then it is clustering index.

6. What is secondary index?
If there is non-ordering field then it is secondary index

7. What is multilevel index?
It is a tree built by indexing the indexes.

8. What is a file?
A ***file*** is a set of records stored as a unit on disk.

9. What is a B+ tree?
An organizational structure for information storage and retrieval in the form of a tree in which all terminal nodes are the same distance from the base, and all non-terminal nodes have between *n* and 2 *n* subtrees or pointers (where *n* is an integer).

10. What is Linear hashing?
Linear hashing allows for the expansion of the hash table one slot at a time.