**1.What is a Database?**  
**Ans:** A database is a collection of related data .A database is a logically coherent  
collection of data with some inherent meaning.

**2. What is DBMS?**  
**Ans:** Database Management system is a collection of programs that enables user to create and maintain a database.  
Thus a DBMS is a general purposed s/w system that facilitates the process of defining constructing and manipulating a database for various applications. (Defining a data base involves specifying the data types, structures and constraints for the data to be stored in the data database.  
Constructing a data base is the process of storing data itself on some storage medium that is controlled by DBMS. Manipulating a database includes such functions as querying the data base to retrieve specific data, updating the database to reflect the changes in the mini-world.

**3. What is a Catalog?**  
**Ans:** A catalog is a table that contain 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 . Whenever a request is  
made to access a particular data, the DBMS s/w refers to the catalog to determine  
the structure of the file.

**4. What is data ware housing & OLAP?**  
**Ans:** 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 .

**5. What is real time database technology?**  
**Ans:** These are all the techniques used in controlling industrial and manufacturing  
processes.

**6. What is program-data independence?**  
**Ans:** Unlike in the traditional file sys. the structure of the data files is stored in the  
DBMS catalog separately from the access programs . This property is called  
program-data independence.i.e. We needn’t to change the code of the DBMS if the  
structure of the data is changed .Which is not supported by traditional file sys .

**7. What is ORDBMS?**  
**Ans:** Object oriented RDBMS is a relational DBMS in which every thing is treated as  
objects. User can define operations on data as a part of the database definition.

**8. What is program-operation independence?**  
**Ans:** An operation is specified in two parts .  
1. Interface (operation name and data types of its arguments).  
2. Implementation (the code part)  
The implementation part can be changed without affecting the interface. This is called  
program-operation independence.

**9. What is a view?**  
**Ans:** 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 .

**10. What is OLTP?**  
**Ans:** Online transaction processing is an application that involve multiple database accesses  
from different parts of the world . OLTP needs a multi-user DBMS s/w to ensure that concurrent  
transactions operate correctly.

**11. What is the job of DBA?**  
**Ans:** A database administrator is a person or a group responsible for authorizing access to the  
database, for coordinating and monitoring its use, and for acquiring s/w and h/w resources as needed.

**12. Who are db designer?**  
**Ans:** Data base designers are responsible for identifying the data to be stored in the database and for  
choosing appropriate structure to represent and store this data .

**13. What are different types of end users?**  
**Ans:**  
1. Casual end-users  
2. Naive or parametric end users  
3. Sophisticated end users  
4. Stand alone users.

**14. What are the advantages of using a dbms?**  
**Ans:**  
1. Controlling redundancy.  
2. Restricting unauthorized access.  
3. Providing persistent storage for program objects and data structures.  
4. Permitting inferencing and actions using rules.  
5. Providing multi-user interfaces.  
6. Representing complex relationships among data.  
7. Enforcing integrity constraints.  
8. Providing backups and recovery.

**15. What are the disadvantages of using a dbms?**  
**Ans:**   
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.

**16. What is a data model?**  
**Ans:** It is a collection of concepts that can be used to describe the structure of a database. It provides necessary means to achieve this abstraction. By structure of a database we mean the data types, relations, and constraints that should hold on the data.

**17. What are different categories of data models?**  
**Ans:**   
1. High-level or conceptual data models.  
2. Representational data models.  
3. Low-level or physical data models.  
High level data models provide the concepts that are close to the way many users perceive data.  
Representational data models are provide concepts that provide the concepts that may be understood by end users but that are not too far removed from organization of data in the database.  
Physical data models describe the details of how data is stored in the computers.

**18. What is schema?**  
**Ans:** 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.

**19. What are types of schema?**  
**Ans:**  
1. internal schema.  
2. Conceptual schema.  
3. External schemas or user views.

**20. What is Data independency?**  
**Ans:** Data independency is defined as the capacity to change the conceptual schema without having to change the schema at the next higher level. We can define two types of data independence:  
1. Logical data independence.  
2. Physical data independence.  
LDI is the capacity to change the conceptual schema without having to change external schemas or application programs.  
PDI is the capacity to change the internal schema without having to change conceptual (or external) schemas.

**21. What are different DBMS languages?**  
**Ans:**  
1. DDL (Data definition language)  
2. SDL (Storage definition language)  
3. VDL (View definition language)  
4. DML (Data manipulation language)

**22. What are different types of DBMS?**  
**Ans:**   
1. DBMS  
2. RDBMS (Relational)  
3. ORDBMS (Object Relational)  
4. DDBMS (Distributed)  
5. FDBMS (Federated)  
6. HDDBMS (Homogeneous)  
7. HDBMS (Hierarchical)  
8. NDBMS (Networked)

**23. What is an entity?**  
**Ans:** An entity is a thing in the real world with an independent existence.

**24. What are attributes?**  
**Ans:** These are the particular properties that describe an entity.

**25. What are diff. types of attributes?**  
**Ans:**   
1. Composite Vs simple attributes.  
2. Single valued Vs multi-valued attributes.  
3. Stored Vs derived attribute.  
4. Null valued attributes.  
5. Complex attributes.

26. What is difference between entity set and entity type?

**27. What is domain value or value set of an attribute?**  
**Ans:** It is the set of values that may be assigned to that attribute for each individual entities .

**28. What is degree of a relationship?**  
**Ans:** The no of entities participating in that relation .

**29. What is recursive relationship?**  
**Ans:** It is the relationship where both the participating entities belong to same entity type .

**30. What are relationship constraints?  
Ans:   
1. Cardinality ratio.  
2. Participation constraints.**

**31. What is Cardinality ratio?**  
**Ans:** The cardinality ratio for a binary relationship specifies the number of relationship instances that an entity can participate in.

**32. What is a Participation constraint?**  
**Ans:** The participation constraint specifies whether the existence of an entity depends on its being related to another entity via the relationship type. This is of two types:  
1. Total participation.  
2. Partial participation.

**33. What is a weak entity types?**  
**Ans:** The entity types that do not have key attributes of their own are called weak entity types.  
Rests are called strong entity types .The entity that gives identity to a weak entity is called owner entity. And the relationship is called identifying relationship. A weak entity type always has a total participation constraint with respect to its identifying relationship.

**34. What is an ER Diagram?**  
**Ans:**   
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.

**35. What is an EER?**  
**Ans:**   
==

**36. What is specialization?**  
**Ans:** 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.

**37. What is generalization?**  
**Ans:** It is the process of finding common attributes and relations of a number of entities and defining a common super class for them.

**38. What are constraints on generalization and specialization?**  
**Ans:**  
1. disjoint ness constraints.  
2. Completeness constraints.  
Disjointness constraint specifies that the subclasses of the specialization must be disjoint .i.e. an entity can be a member of at most one of the subclasses of the specialization. The reverse of it is overlapping.  
Completeness constraint is a participation constraint which may be  
1. Total  
2. Partial  
Total specialization constraint tells that each entity in the super class must be a member of some subclass in the specialization. And partial specialization constraint allows an entity not to belong to any of the subclasses .Thus we do have the following 4 types of constraints on specialization:  
1. Disjoint, total  
2. Disjoint, partial  
3. Overlapping, total  
4. Overlapping, partial

**39. What is a ternary relationship?**  
**Ans:** A relationship with a degree 3 is called a ternary relationship.

**40. What is aggregation and association?**  
**Ans:** Aggregation is an abstraction concept for building composite objects from their component objects. The abstraction of association is used to associate objects from several independent classes.

**41. What is RAID Technology?**  
**Ans:** Redundant array of inexpensive (or independent) disks. The main goal of raid technology is to even out the widely different rates of performance improvement of disks against those in memory and microprocessor. Raid technology employs the technique of data striping to achieve higher transfer rates.  
  
**42. What is Hashing technique?**  
**Ans:** This is a primary file organization technique that provides very fast access to records on certain search conditions. The search condition must be an equality condition on a single field, called hash field of the file.  
1. Internal hashing  
2. External hashing  
3. Extendible hashing  
4. Linear hashing  
5. Partitioned hashing

**43. What are different types of relational constraints?**  
**Ans:**  
1. Domain constraints  
2. Key constraints  
3. Entity integrity constraints  
4. Referential integrity constraints  
Domain constraints specify that the value of each attribute must be an atomic value from the domain of the attributes.  
Key constraints tell that no two tuples can have the same combination of values for all their attributes.  
Entity integrity constraint states that no primary key value can be null.  
Referential integrity constraints states that a tuple in one relation that refers to another relation must refer to an existing tuple in that relation it is specified between two relations and is used to maintain the consistency among tuples of the two relations.

**44. What is difference between a super key, a key, a candidate key and a primary key?**  
**Ans:** A super key specifies a uniqueness constrain that no two distinct tuples in a state  
can have the same value for the super key. Every relation has at least one default super key.  
A key is a minimal super key or the subset of the super key which is obtained after  
removing redundancy. A relation schema may have more than one key .In this case  
each key is called a candidate key. One of the candidate key with minimum number  
of attributes is chosen as primary key.

**45. What is a foreign key?**  
**Ans:** 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.

**46. What is a transaction?**  
**Ans:** A transaction is a logical unit of database processing that includes one or more  
database access operations.

**47. What are the properties of transaction?**  
**Ans:**   
1. Atomicity  
2. Consistency preservation  
3. Isolation  
4. Durability (permanence)

**48. What are the basic data base operations?**  
**Ans:**  
1. Write\_item(x)  
2. Read\_item(x)

**49. What are the disadvantages of not controlling concurrency?**  
**Ans:**  
1. Lost update problem  
2. Temporary update(Dirty read) problem  
3. Incorrect summary problem

**50. What are serial, non serial?**  
**Ans:** 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.

**51. What are conflict serializable schedules?**  
**Ans:** A schedule S of n transactions is serializable if it is equivalent to some serial schedule of the same n transactions.  
  
**52. What is result equivalent?**  
**Ans:** Two schedules are called result equivalent if they produce the same final state of the data base.

**53. What are conflict equivalent schedules?**  
**Ans:** Two schedules are said to be conflict equivalent if the order of any two conflicting operations is the same in both schedules.

**54. What is a conflict serializable schedule?**  
**Ans:** A schedule is called conflict serializable if it is conflict equivalent to some serial schedule.

**55. What is view equivalence?**  
**Ans:** Two schedules S and S’ are said to be view equivalent if the following three conditions hold :  
1. Both S and S’ contain same set of transactions with same operations in them.  
2. If any read operation read(x) reads a value written by a write operation or the original value of x the same conditions must hold in the other schedule for the same read(x) operation.  
3. If an operation write1(y) is the last operation to write the value of y in schedule S then the same operation must be the last operation in schedule S’.

**56. What is view serializable?**  
**Ans:** A schedule is said to be view serializable if it is view equivalent with some serial schedule.

**57. What are the various methods of controlling concurrency?**  
**Ans:**   
1. Locking  
2. Time stamp  
Locking data item to prevent multiple transactions from accessing the item concurrently.  
A time stamp is a unique identifier for each transaction, generated by the system.

**58. What is a lock?**  
**Ans**: A lock is a variable associated with a data item that describes the status of the item with respect to the possible operations that can be applied to it.

**59. What are various types of locking techniques?**  
**Ans:**  
1. a binary lock  
2. Shared/Exclusive lock  
3. Two phase locking

**60. What is a binary lock?**  
**Ans:** A binary lock can have two states or values:  
1. locked (1)  
2. unlocked(0)  
If locked it cannot be accessed by any other operations, else can be.

**61. What is shared or exclusive lock?**  
**Ans:** It implements multiple-mode lock. Allowing multiple accesses for read operations but exclusive access for write operation.

**62. Explain two phase locking?**  
**Ans:** All the locking operations must precede the first unlock operation in the transaction .It does have two phases:  
1. expanding phase (Locks are issued)  
2. Shrinking phase (Locks are released)

**63. What are different types of two phase lockings (2pl)?**  
**Ans:**  
1. Basic  
2. Conservative  
3. Strict  
4. Rigorous  
this is the basic technique of 2pl described above.  
Conservative 2pl requires a transaction to lock all the items it accesses before the transaction begins its execution, by pre-declaring it’s read-set and write-set.  
Strict 2pl guarantees that a transaction doesn’t release any of its exclusive locks until after it commits or aborts.  
Rigorous guarantees that a transaction doesn’t release any of its locks (including shared locks) until after it commits or aborts.

**64. What is a deadlock?**  
**Ans:** Dead lock occurs when each transaction T in a set of two or more transactions is waiting for some item that is locked by some other transaction T’ in the set. Hence each transaction is in a waiting queue, waiting for one of the other transactions to release the lock on them.

**65. What are triggers?**  
**Ans:** Triggers are the PL/SQL blocks definining an action the database should take when some database related event occurs. Triggers may be used to supplement declarative referential integrity, to enforce complex business rules, or to audit changes to data.