1) What is DBMS? Explain its advantages.

Ans ① A database management system is collection of programs that manages the database structure and controls acess to the data stored in the database.

② The DBMS serves as the intermediary between the user and the database. The database structure itself is stored as a collection of files. So, user can acess the data in those files through the DBMS.

③ The DBMS hides much of the database's internal complexity from the application programs and users.

④ ADVANTAGES OF DBMS

a) Reduction of Redundancies :- centralized control of data by the DBA avoids unnecessary duplication of data and effectively reduces the total amount of data storage required. it also eliminates the extra processing necessary to trace the required data in a large mass of data.

b) Elimination of inconsistencies :- The main advantage of avoiding duplication is the elimination of inconsistencies that tend to be present in redundant data files. Any redundancies that exist in the DBMS are controlled and the system ensures that these multiple copies are consistent.

c) shared Data :- A database allows the sharing of data under its control by any number of application programs or users. for example, the applications for the public relations and payroll departements can share the same data.

d) Integrity :- centralized control can also ensure that adequate checks are incorporated in the DBMS to provide data integrity. Data integrity means that the data contained in the database is both accurate and consistent.

e) Security :- Data is of vital importance to an organization and may be confidental, such confidental data must not be accessed by unauthorized person. The DBA who has the ultimate responsibility for the data in the DBMS can ensure that proper acess procedures are followed, including

proper authentication schemes for access to the DBMS and additional checks before permitting access to sensitive data.

f) Data independence :- The ability to modify a scheme defination in one level without affecting a scheme definition in the next level is called data independence. The DBMS can provide an abstract view of data to insulate application code from such details.

Q2) What is Data Abstraction? Explain its levels.

Ans ① Database systems are made-up of complex data structures. To ease the user interaction with database, the developers hide internal irrelevant details from users. This process of hiding irrelevant details from user is called data abstraction.

② There are 3 levels of abstraction.

a) Physical level :- The physical level of abstraction is the lowest level of abstraction that describes how the data is actually stored. The physical level or internal schema, which contains the definition of the stored record, the method of

representing the data fields, expresses the internal view and the acess aids used.

b) Logical level :- The logical level of data abstraction defines what data are actually stored in the database and what relationships exist among those data. In relational DBMS, the conceptual schema describes all relations that are stored in the database.

c) View level :- This is the highest level of abstraction as seen by a user. This level of abstraction describes only the part of entire database which exists to simplify the interaction with the system.

Q3) Who is Database Administrator? Explain the various functions of DBA.

Ans ① One of the main reasons of using DBMS is to have a central control of both data and the programs accessing those data. A person who has such control over the system is called a Database Administrator (DBA).

② The functions of DBA are as follows:-

a) Schema Definition: The Database Administrator creates the database schema by executing DDL statements. Schema includes the logical struture of database table like data type of attributes, length of attributes, intigrity contraints etc.

b) Storage structure and acess method defination :- Database tables or indexes are stored in flat files, heaps, B+ Tree etc.

c) Schema and physical organization modification:- The DBA carries out changes to the existing schema and physical organization.

d) Granting authorization for data modification:- The DBA provides different access rights to the users according to their level. Ordinary users might have higher restricted access to data, while you go up in the hierarchy to the administrator,

you will get more acess rights.

e) Routine Maintenance :- Some of the routine maintenance activities of a DBA are given below.

① Taking backup of database periodically.

② Ensuring enough disk space is available all the time.

③ Monitoring jobs running on the database.

④ Performance tuning.

Q4) Why data models are used in database? Explain its components.

Ans 1) Data Model gives us an idea that how the final system will look like after its complete implementation.

2) It defines the data elements and the relationship between the data elements. Data Models are used to show how data is stored, connected accessed and updated in the database management system.

3) Components of a Data Model.

a) Data set :- A data set contains the logic to retrieve data from a single data source. A data set can retrieve data from a variety of data sources. A data model can have

multiple data set form multiple sources.

b) Event Triggers :- A trigger checks for an event. When the event occurs the trigger runs the PL/SQL code associated with it. The data model editor supports before data and after data triggers as well as schedule triggers.

c) Flexfields :- A flexfield is a structure specific to Oracle Applications. The data model editor supports retrieving data from flexfield structures defined in your Oracle Application database tables.

d) Lists of values :- A list of values is a menu of values from which report consumers can select parameter values to pass to the report.

e) Parameters :- A parameter is a variable whose value can be set at runtime. The data model editor supports several parameter types.

f) Bursting Definitions :- Bursting is a process of splitting data into blocks, generating documents for each data block, and delivering the document to one or more destinations. A single bursting defination provides the instructions for splitting the report data, generating the document, and delivering the output to its specified destinations.

Q5) Define :-

1) Entity :- An entity is a person, place, thing or event about which the data are to be collected and stored. A entity is the fundamental item in any data model as it is distinguishable i.e each entity occurrence is unique and distinct for e.g: customer, student etc.

2) Attribute :- An attribute is the characteristic of any entity. for e.g:- customer entity can be described by attribute such as ~~na~~ name, phone, address, gender. Each attribute is associated with a set off values called domain.

3) Relationship :- A relationship describes an association among entities. for e.g. Relationship exists between publisher and book can be described as: Many books are published by a publisher.

4) Tuple :- It is nothing but a single row of a table, which contains a single record.

5) Degree :- The total number of attributes which in the relation is called the degree of the relation.

6) Cardinality :- Total number of rows present in the Tables.

Q6) Write a note on following:-

a) Primary Key

Ans 1) A primary Key is a field in a table which uniquely identifies each row/record in a database tables.

2) Primary Keys must contain unique values. A primary Key column cannot have Null values.

3) A tables can have only one primary Key, which may consist of single or multiple fields.

4) When multiple fields are used as a primary Key they are called a composite Key.

5) If a table has a primary Key defined on any fields, then it cannot have two records having the same value of that fields.

b) Alternate Key:

Ans 1) Alternate Key is a column or group of columns in a table that uniquely identify every row in that table.
2) A table can have multiple choices for a primary Key but only one can be set as the primary Key.
3) All the Keys which are not primary Key are called an Alternate Key.

c) Candidate Key.

Ans 1) Candidate Key is a set of attributes that uniquely identify tuples in a table.
2) Candidate Key is a superKey with no repeated attributes. The primary Key should be selected from the candidate Keys.
3) Every table must have at least a single candidate Key.
4) A table can have multiple candidate Keys.

but only a single primary Key.

5) Properties of candidate Key :-

① It must contain unique values.

② Candidate Key may have multiple attributes.

③ Must not contain null values.

④ It should contain minimum fields to ensure uniqueness.

⑤ Uniquely identify each record in a table.

d) Attribute and its types.

Ans 1) Attributes are the descriptive properties which are owned by each entity of an Entity set.

2) There exist a specific domain or set of values for each attribute from where the attribute can take its values.

3) Types of Attributes :-

ⓐ Simple attributes

ⓑ Composite attributes.

ⓒ single valued attributes.

ⓓ Multi valued attributes.

ⓔ Derived attributes.

ⓕ Key attributes.

e) Strong Entity.

Ans 1) A strong Entity set is an entity set that contains sufficient attributes to uniquely identify all its entities.
2) In other words, a primary Key exists for a strong entity set.
3) Primary Key of a strong entity set is represented by underlining it.
4) A single rectangle is used for representing a strong entity set. and A diamond symbol is used for representing the relationship that exists between two strong entity sets.

f) Generalization.

Ans 1) Generalization is like a bottom-up approach in which two or more entities of lower level combine to form a higher level entity if they have some attributes in common.
2) In generalization, an entity of a higher level can also combine with the entities of the lower level to form a further higher level entity.
3) Generalization is more like subclass and superclass system, but the only difference is

the approach. Generalization uses the bottom-up approach.

4) In generalization, entities are combined to form a more generalized entity, i.e, subclasses are combined to make a superclass.

9) Specialization.

Ans 1) Specialization is a top-down approach and it is opposite to Generalization. In specialization, one higher level entity can be broken down into two lower level entities.

2) Specialization is used to identify the subset of an entity set that shares some distinguishing characteristics.

3) Normally, the superclass is defined first, the subclass and its related attributes are defined next, and relationship set are then added.

Q7) Explain relationship with its types.

Ans 1) A relationship, in the context of databases is a situation that exists between two relational database tables, when one table has a foreign Key that references the primary Key of the other table.

2) Relationships allow relational databases to split and store data in different tables, while linking disparate data items.

③ Types of Relationship exist among entities.

a) One-to-one :- A one-to-one (1:1) relationship is when at most one instance of a entity A is associated with one instance of entity B.

b) One-to-many :- A one-to-many relationship is when for one instance of entity A, there are zero, one, or many instances of entity B, but for one instance of entity B, there is only one instance of entity A.

c) Many-to-many :- A many-to-many relationship sometimes called non-specific, is when for one instance of entity A, there are zero, one, or

many instances of entity B and for one instance of entity B there are zero, one, or many instances of entity A.

Q8) Explain DDL and DML Commands.

Ans 1) DDL is used for specifying the database schema. it is used for creating tables, schema indexes, constraints etc. in database.

2) Commands as ALTER, DROP, CREATE.

3) A data-manipulation language (DML) is a language that enables users to acess or manipulate data as organized by the appropriate data model.

4) The types of acess in DML are:-

- Retrieval of information stored in the data base.
- Insertion of new information into the data base
- Deletion of information from the data base.
- Modification of information stored in the data base. commands listed as SELECT, INSERT, UPDATE, DELETE.