SESSION 1: APPRECIATE THE CONCEPT OF DATABASE MANAGEMENT SYSTEM

A database is an organized collection of data. It is considered as a container of information.

In the manual system, you would maintain several files with different bits of information while in the computerized system you would use database programs such as Microsoft Access, OpenOffice.org Base, and MySQL, to organize the data as per your business need.

Database Management System :

A database management system is a software package with computer programs that controls the creation, maintenance, and use of a database. for example Oracle, IBM DB2, Microsoft SQL Server, Microsoft Access, PostgreSQL, MySQL, FoxPro, and SQLite.

Data can be organized into two types:

Data can be organized into two types:

Flat File : Data is stored in a single table. Usually suitable for less amount of data.

Relational : Data is stored in multiple tables and the tables are linked using a common field. Relational is suitable for medium to large amount of data.

Database Servers :

Database servers are dedicated computers that hold the actual databases and run only the DBMS and related software.

Advantages of Database :

1) Reduces Data Redundancy : Database reduces data redundancy (duplication of data)

2) Sharing of Data : In a database, the users of the database can share the data among themselves.

3) Data Integrity : Data integrity means that the data is accurate and consistent in the database.

4) Data Security : Database provides data security as only authorized users are allowed to access the database and their identity are authenticated by using a username and password.

5) Privacy : The privacy rule in a database states that only the authorized users can access a database according to its privacy constraints.

6) Backup and Recovery : Database Management System automatically takes care of backup and recovery.

Some key features of a database:

1) A database can have one or many tables.

2) Each table in a database contains information about one type of item.

3) Every table has a key field which ensures that there are 100% unique values throughout the database.

Important Terms :

1) Primary Key : A primary key is a unique value that identifies a row in a table. It helps the database to search for a record.

2) Composite Primary Key : When primary key constraint is applied on one or more columns then it is known as Composite Primary Key.

3) Foreign key : The foreign key identifies a column or set of columns in one (referencing) table that refers to a column or set of columns in another (referenced) table.

Database Management System Class 10 Notes
ASSESSMENT
Fill in the blanks:
1) A __ is an organized collection of data.

2) A ____ is a software package that can be used for creating and managing databases.

3) A _____ is a database management system that is based on the relational model.

4.Three popular DBMS software are _____ , _____, &
_____

5) A _____ is a unique value that identifies a row in a table.

6) Composite Key is a combination of _____ columns.

Short Answer Questions
Q1. What does DBMS stands for?

Q2. What does RDBMS stands for?

Q3. How is data organized in a RDBMS?

Q4. State the relationship and difference between a primary and foreign key?

SESSION-2 : CREATE AND EDIT TABLES USING WIZARD & SQL COMMANDS
Data in a relational database management system (RDBMS) is organized in the form of tables.

DATABASE OBJECTS :
1) Table : A table is a set of data elements (values) that is organized using a model of vertical columns and horizontal rows.

2) Columns or Fields or Attributes: A column is a set of data values of a particular simple type, one for each row of the table.

3) Rows or Records or Tuples : A row also called a Record or Tuple represents a single data item in a table. Every row in the table has the same structure.

Creating Database Using OpenOffice :
1) Open the OpenOffice Base Application by Clicking on Start>Programs>OpenOffice.org 4>OpenOffice.org Base.

2) Create a new database by selecting the option Create a new database

3) Database wizard appear. Click Finish. The Save As dialog box appears.

4) Specify a name for the database in the File name: field and click Save.

Create Tables :
Tables are the basic building blocks of a database. You store the data in the database in the form of tables.

There are different ways to create a table:

a) Use Wizard To Create Table: The following are the steps to create a table:

1) Click on Tables > Use Wizard to Create Table

2) Click the Select Fields > Choose Category > Select the table > Click on Next Button.

3) Select the fields as per the requirements. Click on Next button

4) Set the data types and properties of the selected fields. Click on Next Button

5) Set the Primary Key and Click on Next Button

6) Window to rename the table will open. A user can either go ahead with the same table name or can change it.

7) Click on Finish to insert the data in the table.

b) Creating table using Design View

1) Click on Create Table in Design View.

2) Specify the field name and data type of the field.

3) Save the table by clicking on File > Save

4) Specify the table name. The default name is Table1. Click OK.

5) An alert appears, if there is no primary key in the table.

6) Click yes and set the primary key and finally save the table.

Data Types :
Datatypes are used to identify which type of data (value) we are going to store in the database. Data types in OpenOffice base are broadly classified into five categories listed below.

Numeric Types
Alphanumeric Types
Binary Types
Date time

Other Variable types
Numeric Types :
Numeric data types in a database can be used for storing information such as mobile number, roll number, door number etc. The different types of numeric data types available are listed here.

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Alphanumeric Types :
This data type is used to store information which has alphabets as well as numbers for example address, book summary field etc. The different types of Alphanumeric Types available are listed here.

Binary Types :
Binary data types are used for storing data in binary formats. Binary data types in a database can be using for storing photos, music files, etc.

DATE TIME :
Date time data types in a database can be used for storing information such as date of birth, date of admission, date of product sale, etc.
ASSESSMENT
Fill in the blanks:
1) A table is a set of data elements that is organized using a model of vertical and horizontal _____.

2) A _____ is a set of data values of a particular type, one for each row of the table.

3) A_____ _ represents a single, data item in a table.

4) _____ are used to identify which type of data we are going to store in the database.

5) There are _____ ways to create a table.

6) Field properties can be set in both the _____ and _____ .

Short Answer Questions
Q1. In how many ways tables can be created in Base?

Q2. Why are data types used in DBMS /RDBMS?

Q3. List datatypes available in Numeric Datatype?

Q4. List datatypes available in Alphanumeric Datatype?

Q5. Define the structure of a table.

Q6. Differentiate between Tuples and Attributes of a table.

Q7. Name different Binary data types.

SESSION 3: PERFORM OPERATIONS ON TABLE
In OpenOffice Base, data is stored in tables which can be inserted, modified and removed using appropriate options.

Inserting Data In The Table : To insert the data in the table, follow the steps:
1) Select the table > Double click on it.

2) The table will open in Datasheet View.

3) Insert the required number of records in Datasheet View.

Editing Records In The Table : To edit the data in the table, follow the steps:
1) Select the table > Double click on it.

2) The table will open in Datasheet View.

3) Edit the required record in Datasheet View.

Deleting Records From The Table : To remove the data from the table, follow the steps:
1) Select the table > Double click on it.

2) The table will open in Datasheet View.

3) Select the data > right click on selected data > select the Delete option

Field Properties :
To set the field properties: Select the table > Right click > Select the option Edit > the table will open in Design View.

In design view there are different properties of fields according to the data type set for each field.

The properties of numeric type data is given below :
1) AutoValue – if set to yes then field will get the auto numeric values.

2) AutoValue – if set to yes then field will get the auto numeric values.

3) Length – By default length of the field is 10 but the size of the field can be set to maximum length.

4) Default Value – A default value can be set for a field if user don’t provide any value while entering the values in the table.

5) Format – This property helps to set the format of the data entered in the field such as 91-222-333.

The properties of character type data is shown below :
1) Entry Required – if set to yes then it will be must to insert the value in the field.

2) Length – By default length of the field is 10 but the size of the field can be set to maximum length.

3) Default Value – A default value can be set for a field if user don't provide any value while entering the values in the table.

4) Format – This property helps to set the format of the data entered in the field such as 91-222-333.

Sorting Data :
Sorting means to arrange the data in either ascending order of descending order.

Referential Integrity :
Referential integrity is used to maintain accuracy and consistency of data in a relationship. In Base, data can be linked between two or more tables with the help of primary key and foreign key

Referential integrity helps to avoid:
1) Adding records to a related table if there is no associated record available in the primary key table.

2) Changing values in a primary if any dependent records are present in associated table(s).

3) Deleting records from a primary key table if there are any matching related records available in associated table(s).

Creating and Editing Relationships between Tables :
A relationship refers to an association or connection between two or more tables. Relationships between tables helps to:

Save time as there is no need to enter the same data in separate tables.
Reduce data-entry errors.
Summarize data from related tables.
You can create a relationship between any two tables by selecting Relationships option from the Tools menu.

There are three types of relationships which can be created in tables:

1) ONE to ONE Relationship : In this relationship, both the tables must have primary key columns.

2) One to Many Relationship : In this relationship, one of the table must have primary key column.

3) Many to Many Relationship : In this relationship, no table has the primary key column.

Remove the Relationships
The relationships applied on the tables can be removed also with the help of Delete option. Right Click on the relationship thread and select Delete option.

ASSESSMENT
Fill in the blanks:

1) The types of languages used for creating and manipulating the data in the Database are _____ & _____.

2) A _____ is a standard for commands that define the different structures in a database.

3) A _____ is a language that enables users to access and manipulate data in a database.

4) A _____ is a part of DML involving information retrieval only.

5) A popular data manipulation language is _____.

6) _____ are the basic building blocks of a database.

7) There are _____ types of Relationships in a table.

Short Answer Questions:

Q1. What is the file extension for databases created using OpenOffice.Org Base?

Q2. List any three file formats that can be managed using OpenOffice.Org Base?

Q3. How many types of relationships can be created in Base? Explain each of the them.

Q4. What do you mean by Sorting? In how many ways it can be done?

Q5. Explain Referential Integrity with the help of an example.

SESSION 4: RETRIEVE DATA USING QUERY
A query is to collect specific information from the pool of data. A query helps us join information from different tables and filter that information

OR

Queries are commands that are used to define the data structure and also to manipulate the data in the database.

There are two types of languages:-

DDL (Data Definition Language)
DML (Data Manipulation Language)
Common DDL Statements are:-
Create :- Used to create database or tables.
Alter :- Used to modify structure of table.
Drop :- Used to delete database objects.
Common DML Statements are:-
SELECT :- Used to retrieves information from the database.
INSERT :- Used to insert new record into the database.
DELETE :- Used for deletion of information in the database.

UPDATE :- Used for modification of information in the database
Select Statement :
A SELECT statement retrieves zero or more rows from one or more tables. SELECT is the most commonly used Data Manipulation Language(DML) command. To retrieve all the columns in a table the syntax is:
SELECT * FROM <Table Name>;

For example, if you want to display all the data from table emp (short form of employee), the command is

Select * from emp;

The SELECT statement has many optional clauses:

WHERE specifies which rows to retrieve.
ORDER BY specifies an order in which to return the rows.
for example : Select * from emp where name = “Ravi”;

The above query will show result of a particular employee named “Ravi”.

Select * from emp order by Salary;

The above query will show all the records of table emp according to ascending order of column Salary.

Performing calculations :
In Base, simple calculations can be done on the data using arithmetic operators. Example:

1) To display the salary of all the employees after incrementing by 1000 then the following SQL command will be executed in Base. (Fields of table Employee are EmployeeID, FirstName, Salary)

Select “EmployeeID”, “FirstName”, “Salary” +1000 from “Employee”;

2) To display the salary of all the employees after decreasing by 10000 then the SQL command will be:

Select “EmployeeID”, “FirstName”, “Salary” – 10000 from “Employee”;

3) To display the salary of all the employees after incrementing it as twice the amount of present salary, then the SQL command will be .

Select “EmployeeID”, “FirstName”, “Salary” * 2 from “Employee”

Update Statement :
Update statement is used for modifying records in a database. The general syntax of the update statement is as follows:
UPDATE <table name> SET <Column name > = value [WHERE <Condition>];

for example :

1) To increase(update) the salary of employee “Ravi” by Rs 2000 (in table Employee)then the SQL command will be:

Update Employee set Salary = Salary + 2000 Where FirstName = “Ravi”;

Assessment
Fill in the blanks
1) A _____ helps the user to systematically store information in the database.

2) A _____ enables users to view, enter, and change data directly in database objects such as tables.

3) _____ statement retrieves zero or more rows from one or more database tables or database views.

4) By default, data is arranged in _____ order using ORDER BY clause.

5) _____ statement is used for modifying records in a database.

6) _____ statement is used to remove one or more records in a Database.

Short Answer Questions:
Q1. Name DML commands.

Q2. What is the purpose of using queries?

Q3. Which clause of Select statement helps to display specific data?

Q4. Differentiate between Where and Orderby clause of SQL statements.

Q5. State the purpose of Update Command with the help of an example.

SESSION 5: CREATE FORMS AND REPORTS USING WIZARD
FORM : A form provides the user a systematic way of storing information into the database. It is an interface in a user specified layout that lets users to view, enter, and change data directly in database objects such as tables.

Creating Form Using Wizard : Steps To Create Form Using Wizard are :
1) Click Use Wizard to Create Form… option under Tasks group. The Form Wizard dialog box appears.

2) Select selective fields to be sent onto the form by selecting the field name and clicking >button and click Next.

3) Select the option Add Subform if you need to insert the contents in the table in a separate form and click Next.

4) Arrange selected fields in a form and click Next.

5) Select the data entry mode and click Next.

6) Specify the styles to be used in the form and click Next.

7) Specify the name of the form. Click Finish.

REPORT : A report helps to display the data in a summarized manner. It is used to generate the overall work outcome in a clear format.

Creating Reports using wizard : Steps To Create Report Using Wizard are :
1) Click on Use Wizard to Create Report… option available under Tasks.

2) Select all the table fields by selecting the >> button.

3) Redefine the label of the fields in the reports or else you can set the default name and click Next.

4) Define grouping for the fields of the table if required and click Next

5) Sort the field in the report by selecting the appropriate field name and sorting method(if required) and click Next.

6) Select the layout of the report and click Next.

7) Define a name for the report and click Finish.

Fill in the blanks
1) To create a form you need to select _____ option available under Database section.

2) A _____ is helps to collect specific information from the pool of data in the database.

3) _____ is used to display the display the summary of data.

4) _____ are the interfaces with which the user interacts.

5) Data from multiple tables can be stored in _____.

Short Answer Questions:
Q1. Why there is a need to create Forms?

Q2. What is the purpose of creating Reports?

Q3. What are the prerequisites to create a Form and Reports?

Q4. Differentiate between Forms and Reports.

Q5. Can a form displays data from queries?

Q6. In how many ways Forms and Reports can be created in a database?