DATABASE DEVELOPMENT

CHAPTER 8

UNIT INTRODUCTION

This unit is dedicated to relational database management systems. It provides practical training for developing database management systems using Access software by creating tables, forms, queries and reports.

8.1 INTRODUCTION

Q.1 Give a brief introduction to database and relational database.
Answer

Databases are developed to provide facilities to store, manage and retrieve information in an organized way. Relational databases have been also developed in organizations for managing business information in an organized way. Relational database management system (RDBMS) is a relational database. Database development includes the creation of database objects (tables, forms, queries, reports, etc.), keys and relationships between the tables.

8.1.1 VARIOUS TYPES OF DATABASE MANAGEMENT SYSTEMS

Q.2 There are types of RDBMS.
Answer
Types of Relational Database Management Systems (RDBMS)
There are three types of relational database management systems (RDBMS). These are:
- Microsoft Access
- OpenOffice Base
- SQL Server

Fig.8.1 Open Office Base Database Management System

Q.3 What is Microsoft Access? Which tools are used in Access for managing database?
Answer
Microsoft Access
It is one of the popular database software by Microsoft.
Tools for Managing a Database
The following objects are used in Access for managing a database:
1. Table
It stores all the data of a database.
2. Form
It is a window that displays data for viewing, entering and editing information.
3. Query
It is used to gather information based on one or more criteria.
4. Report
It is used for printing information from database.

Q.4 Write a note on OpenOffice Base.
Answer
OpenOffice Base
OpenOffice Base is the database module of OpenOffice Suite. It is an open source application program. OpenOffice Base is a fully featured database management system. It features wizards to help users create tables, forms and reports. It also has a query design tool and a table editor. It allows users to create interactive databases where they can manage data related to people, inventory, assets, budgets, customers, sales orders and invoices, etc.
The information in OpenOffice databases can be exported to other database programs and also to plain text files and spreadsheets.

Q.5 What is SQL server? State its functions and versions.
Answer
SQL Server
SQL Server is a product of Microsoft Office. SQL Server is a relational database management system that offers a variety of tools for database development, maintenance and administration.

Fig.8.2 SQL Server Database Management System

Its main function is to be the backbone of client/server and Internet based software applications. It has different versions suitable from small applications for a number of users to big applications for thousands of users. It provides environment to create databases that can be accessed from different computer media such as personal digital assistant. It is also used to create and manage Web-based databases.

8.1.2 SELECTING A SUITABLE DBMS

Q.6 Give a brief introduction of Microsoft Access as a DBMS.
Answer
Microsoft Access 2007 is used to and manages a database. Microsoft Access is popular worldwide database software suitable for business and home to develop and manage a database. It is already installed on many computers when purchased and it is easily available for purchase.

Q.7 Write a note on Access Window.
Answer
Ribbon Window
The Access Ribbon located near the top of the Access Window, is the control center in Access as shown in Fig. 8.3.

Fig.8.3 Microsoft Access Ribbon

The ribbon provides easy way to create and manage a database object. There is a row of ribbon tabs with headings such as Home, Create, External Data and Database Tools. The Home tab contains the more frequently used commands. Clicking on each tab presents you with its own individual set of ribbons, each with similar icons. Each icon on a ribbon is contained within a group of icons that perform similar tasks.
Example
To display the Create tab, click Create on the ribbon. The Create tab has groups for Tables, Forms, Reports and Other.

Q.8 Briefly explain Microsoft Office Button.
Answer
Microsoft Office Button
The Office button is located in the top left corner of the Access Window. You click this button to perform tasks such as saving, opening, new file creation and printing, etc. To the right of the button is the Quick Access Toolbar that provides quick access to some more commonly used commands such as Save, Undo, Redo, etc. Clicking on the Office button opens a menu that is very similar to Microsoft Word program. You can customize the toolbar to add additional commands.

Q.9 What is Access Navigation Pane?
Answer
Access Navigation Pane
The Access Navigation Pane displays icons for all the tables, forms, queries and reports that you create as shown in Fig.8.4.

Fig.8.4 Access Navigation Pane

When you want to open any database object, you just click one of these icons and the required object will open in the main Access window.

8.1.3 CREATING AND SAVING AN ACCESS DATABASE

Q.10 Describe the steps for creating an Access database.
Answer
The first step in creating an Access database is to create a blank database file. This is done from the Getting Started Window when you run the Access program. This file is saved in one of the folders of your computer, which you specify. The procedure for this is described below:
Creating a Blank Database
- Following steps are used for launching Access 2007:
1. Click the Start button on the Windows taskbar.
2. Click All Programs on the Start menu.
3. Click Microsoft Office on the All Programs submenu.
4. Click Microsoft Office Access 2007 on the Microsoft Office submenu.

Microsoft Office Access opens and displays the Getting Started with Microsoft Office Access screen. Click the Blank database icon to bring the Blank Database side bar on the right side of the screen as shown in Fig.8.5.

Fig.8.5 Blank Database side bar

Q.12 Write down the steps to enter filename for your Access database.
Answer
Enter a Filename for your Access Database
1. Enter a file name for database file.
2. Click the folder icon and browse for selecting a location for saving your database.
3. Click the Create button to create and save your database. The database you just created will open for you to work on.

8.1.4 DATABASE OBJECTS

Q.13 What are the main objects used in Access? Explain
Answer
Database Objects
There are the main objects used in Access:
- Tables
- Forms
- Queries
- Reports

1. Tables
Tables stores all the information of a database in one or more tables. Information stored in tables is very similar to the Excel worksheet. Information in tables is organized in rows and columns.
2. Forms
Forms is a window that is used for viewing, modifying or deleting data that is stored in tables and for adding new data.
3. Queries
Queries are used to gather selected information from a database and organize it either for use in reports or for viewing on screen. A query can combine information from multiple tables.
4. Reports
Reports are used for printing information from a database. A report can combine data from more than one table.

8.2 WORKING WITH TABLES

Q.14 Give a brief introduction of tables in Access.
Answer
Like all the relational databases, Access stores data in tables. Each horizontal row represents a single record and each column represents a table field. Each row of table is a record of a particular person, item, product, etc.

8.2.1 CREATING, SAVING AND EDITING A TABLE

Q.15 Describe the method to create a student database management system.
Answer
We are going to create a Student Database Management System. This database consists of two tables, a form, queries and reports. The two tables are STUDENT table and RESULT table. STUDENT table will store students' particulars and RESULT table will store their results of various examinations throughout the year.
Creating the STUDENT Table
The following are the steps mentioned to create the STUDENT Table:
1. Click the Create tab.
2. Click Table Design icon in the Tables group to bring the table design grid as shown in Fig.8.7.

Fig.8.7 Table Design Grid

3. Enter STUDENTID (Select Field Name in the first row as shown in Fig.8.8.

Fig.8.8 Defining field names and data types

This field will contain a unique reference number for each student.
4. Click on the cell below Data Type and select AutoNumber from the drop-down list because we want this field to be automatically generate a unique reference number for each student.
5. On the next row enter STD NAME (Student Name) in the Field Name and select Text for Data Type.
6. Click on the cell on the right side and select Text data type, which is default.
7. Enter 10 in the cell on the right side of Field Size in the Field Properties section to allow maximum 10 characters for the student name.
In a similar manner enter the fields CLASS, DOB (Date of Birth) and CITY. Date type of CLASS is Text of field size 6, data type of DOB is Date/Time. After selecting the Date/Time data type for DOB, select Short Date in the Format drop-down list in the Field Properties section and select General Date from the drop-down list as shown in Fig.8.9.
Finally enter the CITY field name with data type Text having field size 10.
Selecting Primary Key
Now we need to select, choose the Primary key, which in this case is STUDENTID. To do this:
1. Select STUDENTID row by clicking on it.
2. Click the Primary Key icon in the Tools group.
3. Save the table by clicking the save icon on the top left of the screen above the Access Ribbon.
4. Enter the name STUDENT in Save As dialog box and click OK.
Entering Data in Table
Now enter data in the table in datasheet view, just as you enter in an Excel worksheet. Double click on the STUDENT table in the Navigation Pane and enter the data in the table that is shown in Fig.8.10.

Fig.8.10 Entering records in STUDENT table

1. Click in cell below STD NAME and enter ZAHEER.
2. Press right arrow key to move to CLASS column and enter XI-A.
3. Press right arrow key again and enter 12-5-96 in DOB column.
4. Press right arrow key again and enter KARACHI in CITY column (KARAMPAK). The General Date format will be automatically applied to the date whenever you specified when you created this field.
As soon as data is entered in the STD NAME field of first record, STUDENTID field automatically gave a number. If a datasheet or new record is entered, it is incremented by one. You never have to enter value for this field.
Enter all the 8 records in the student table following the same method. Data in records is automatically saved.

Q.16 Describe the method to create the RESULT table for STUDENT table.
Answer
Creating the RESULT Table
Create the RESULT table just as you created the STUDENT table having the fields' data types and field size given in Fig.8.10.

Field Name	Data Type	Field Size
RESULTID	Number	Long Integer
EXAMINATION	Text	10
MATHS	Number	Integer
PHYSICS	Number	Integer
COMPUTER	Number	Integer

Fig.8.10 Fields and Data Types for RESULT table with their data types

Field Field – RESULT ID
The RESULT field, RESULTID is a foreign key field and it will be used later to link this table with the STUDENT table. Select Number for Data Type. The field size of RESULTID and STUDENTID and RESULTID must be the same, which is Long Integer.
Second Field – EXAMINATION
The field EXAMINATION will store the name of the examination such as MID-TERM, FINAL, etc. The set three fields, MATHS, PHYSICS and COMPUTER will store the marks of three subjects and their data type is Integer. Integer data type is selected for these fields from the Fields Properties section because we will not enter any decimal value in these fields. Select Text for the first field. Open the drop-down menu and select Integer. If you select Long Integer for these fields, it will occupy more memory.

Q.17 Make a list of the steps to edit the structure of a table.
Answer
Editing the Structure of a Table
User can edit the structure of a table in the Design View. This is shown in Fig.8.11

Fig.8.11 Editing structure of table

1. In Design View, you can add, insert or delete fields.
2. To delete a field, click the selection box on the left side of the field and press the Delete key.
3. To add a new record, enter the field name below the last field and specify its data type.
4. To insert a new field, click the row where you want the new field to be below which you want to insert the new field and press the Insert key. You can also specify the field name.

8.2.2 DATA TYPES IN ACCESS

Q.18 Explain the data types used in Microsoft Access.
Answer
Data Types in Access
There are seven types of field data types, which are commonly used in Access. These data types are given below:

- Text
- Memo
- Number
- AutoNumber
- Yes/NO
- Currency
- Date/Time

1. Text
Text fields are most common, so Access assigns Text as the default data type. A Text field can contain as many as 255 characters and you can define a maximum length less than or equal to 255. Access assigns a default length of 50 characters.
2. Memo
Memo fields ordinarily contain as many as 65,535 characters. You can use them to provide descriptive comments. Access displays the contents of Memo fields in a Datasheet view. A memo field cannot be a key field.
3. Number
Various numeric data subtypes are available in the Field Properties panel of Table Design window. Choose the appropriate subtype by selecting one of the Field Size property settings. You specify how to display the number by setting its Format property to one of the formats.
4. AutoNumber
An AutoNumber field is a numeric (Long Integer) value that Access automatically fills in for each new record you add to a table. Access can increment the AutoNumber field by 1 for each new record or it can assign a random number to the field. You can specify the AutoNumber field to use the format you choose. The maximum number of records in a table that can use the AutoNumber field is slightly more than 2 billion.
5. Yes/No
Logical fields in Access use -1 for Yes (True) and 0 for No (False). You use the Format property to display Yes/No fields as Yes or No, True or False, On or Off or -1 or 0.
6. Currency
Currency is a special field format with four decimal places designed to prevent rounding errors that would affect accounting operations where the value must match to the penny.
7. Date/Time
Dates and times are stored in a special field format. The whole number portion of the Date/Time value represents the date and the time is represented by .fill decimal fraction. You control how Access displays dates by selecting one of the Date/Time Format properties.
Additional Properties of a Table Field
Apart from the Field Size and Format that you choose for a field, you can set additional properties for a table field. You set these additional properties on the General page of the Table Design window's Field Properties pane by selecting from drop-down or combo box or by typing values in text boxes.
Input Mask Property
When you have defined all the fields that you want to include in your table, you must save it. When you close the Table Design window, it will ask you whether you want it to save it or not. Select save and enter a table name. You can also save it by clicking the save icon on the top left corner of the screen.

8.2.3 CREATING PRIMARY KEY AND FOREIGN KEY

Q.19 How do we create a primary key in Access?
Answer
Creating Primary Key
After defining all the field names and their data types in Design View, create a primary for the table

as shown in Fig.8.12

Fig.8.12 Creating primary key for STUDENT table

1. Select the field name STUDENTID by clicking the selection box on the left side of the field name.
2. Click the primary key icon on the Table group of Design tab.
In our project of Student Database Management System, we are going to make RESULTID field the foreign key when we create relationship between the STUDENT table and the RESULT table.

8.2.4 CREATING AND EDITING RELATIONSHIP BETWEEN TABLES

Q.20 Describe one create table. Explain how association is created in table and field?
Answer
A database can contain many tables. The reason to put more than one table into a database is that it is easier to manage data if all the information about a particular subject is in its own table.
Example
In our Student Database Management System, we have created two tables, one for holding students' particulars and the other for holding their results of various examinations throughout the year.
Creating Connection in Table and Field
Connection between two tables is made in one table and a field in another table must be defined within Access. Such a definition is known as a relationship and each of the fields is said to be related to the other field. Once a relationship has been designated, Access can help you maintain the integrity of the relationship. Once a relationship has been established, Access can automatically also allow you to create queries, forms and reports that display information from several tables at once.

Q.21 Describe the method to create relationship between STUDENT and RESULT TABLE.
Answer
Creating Relationship between STUDENT and RESULT Table
The first step in creating a relationship between the STUDENT table and the RESULT table. This requires that primary key field, STUDENTID of the STUDENT table must have a unique value but the values in the foreign key field, RESULTID can match many entries in the related field of the RESULT table. Both fields must have the same data type and field size. The field, STUDENTID should be AutoNumber and the data type of RESULTID should also be a number but it can have duplicate entries.
Steps for Creating Relationship
The steps for creating relationship are given below:
1. Click the Relationship icon in the ribbon of Database Tools as shown in Fig.8.13

Fig.8.13 Click the creating relationship icon

2. Click the STUDENT table and click the Add button shown in Fig.8.14

Fig.8.14 Table Add dialog box for adding tables

3. Move the dialog box, which displays the table names in the Relationships window.
4. Click the Close button to close the dialog box.
5. Move the mouse pointer to the primary key STUDENTID and drag it to the foreign key RESULTID in the RESULT table.

Q.22 Write down the steps for editing relationship.
Answer
Steps for Editing Relationship
The steps for editing relationship are given below:
1. Release the mouse button to reveal the Edit Relationship dialog box shown in Fig.8.15.

Fig.8.15 Edit Relationship dialog box for creating relationship

2. Check the Enforce Referential Integrity, Cascade Update Related Fields and Cascade Delete Related Records boxes.
3. Click the Create button to finish the job.
Access shows the relationship between two tables as a join line connecting the related fields as shown in Fig.8.16.

Fig.8.16 One-to-many relationship between STUDENT and RESULT table

The appearance of the join line tells you how Access is enforcing the relationship and whether you are forcing referential integrity. The small 1 indicates the table on the one side of the relationship and the small infinity sign indicates the table on the many side of the relationship.

Q.23 Write the steps for editing relationship among tables.
Answer
Editing Relationship among Tables
To change relationship between tables, click Relationship in the Database Tools tab.
1. Click the join line that connects the fields. When you select the join line, the line becomes darker.
2. Press the Delete key to delete the existing relationship.
3. Click the Close button to close the window and save the relationship.
4. Now, recreate the relationship by using the procedure described earlier.

Q.24 Explain 'Referential Integrity'.
Answer
Referential Integrity
The capability to enforce referential integrity is an important feature of Access. Referential integrity enforcement prevents you from deleting or modifying values of a primary table's record on which related records depend.
Explanation
Suppose you delete a student's record from STUDENT table. Access prevents you from doing so. Access displays a message box informing you that you must delete all related records in primary table's record before you can delete the primary record. You cannot change a value in the STUDENT table's STUDENTID field if there are related records in the RESULT table. If you try to change a value in RESULT table in a field that does not exist in the STUDENT table's STUDENTID field, you get error message again. With referential integrity enforced, Access automatically ensures that all values you enter correspond to valid STUDENTID value when you save the new or edited record.
Access 2007's cascading deletion and cascading update options for tables with enforced referential integrity automatically delete related records in the primary table when you delete a record. Cascade Delete Fields and Cascade Delete Related Records check boxes and Access does all the work for you.

8.2.5 NAVIGATING THROUGH RECORDS IN A TABLE

Q.25 Describe the navigation buttons of a table.
Answer
Navigation buttons of a table
The navigation buttons of a table are at the bottom left corner. When you click an arrow field of a record, you can see the record number in the table in the Navigation Pane. The button to the left of the record number will move you to the first record in the table. The button to the right of the record number will move you to the last record in the table. The last button on the right side will add a new record to the table. Click the last button and a new record by clicking the New icon in the Records group on the Home tab.

8.2.6 ADDING, MODIFYING AND DELETING RECORDS

Q.26 Make a list of the steps for adding records in a table.
Answer
Adding Records in a Table
Following are the steps for adding new records in a table:
1. Right click on the table in the Navigation Pane in which you want to add new record and select Open option or double click it.
2. Click the New icon in the Records group of Home tab or click the new record button in the navigation bar at the bottom left of the screen. This will move the pointer to the first blank line after the last record.

Q.27 Write down the steps for adding records in a related table.
Answer
Adding Records in a Related Table
The following are the steps for adding records in RESULT table which is related with STUDENT table
1. Open the STUDENT table in Datasheet view and select a record.
2. Click the '+' symbol at the left end of the first row in STUDENT table.
3. Add data for the related record at RESULT table as shown in Fig.8.17.

Fig.8.17 Adding record in a related table

You can add results of more than one examination in the RESULT table since there is one-to-many relationship between the STUDENT table and the RESULT table.

Q.28 Describe the method to modify record in a table.
Answer
Modifying Records in a Table
To modify existing information in a set, just click the cell containing the data that you want to change. Type the new information and press Tab or Enter to move to the next cell. Alternatively, you can use Delete or Ctrl+X keys to clear the field and then type the new data. Changes are saved as you move to another record. You can also undo the last change you made in a record by pressing Esc key.

Fig.8.18 Modifying a record

When you finish editing data in a row and move out of the row, the changes will be saved automatically and the pencil will disappear.

Q.29 Write down the steps to delete records from a table. Also state the method to delete multiple records.
Answer
Deleting Records from a Table
The following are the steps for deleting records from a table:
1. Open the table from which you want to delete record.
2. Select the record you want to delete by clicking the row selector box, which is on the left end of the row.
3. Press the Delete key or choose Delete from the Records option on the Home tab.
4. Click Yes when prompted to proceed with the deletion in the dialog box that appears.
Deleting Multiple Records
You can select and delete multiple records by selecting them by clicking the row selector and dragging the mouse over the adjacent row selectors.
Once you delete a record and click Yes button to confirm your action, you will not be able to restore the record. You cannot undo a record deletion by choosing Undo from the Quick Access Toolbar. If you accidentally delete a record, you can get it back only by using a backup copy.
Deleting a table from a database can be deleted in a similar way as deleting records. Keep in mind the distinction between deleting a row (record) which is all the fields of information about a single entry and deleting a column for every record in the table. It is generally easier to rearrange or record than a field in a table.
When a record in a table is deleted that is related to another table, Access might need to delete one or more records in the related table to enforce referential integrity. Before doing so it will display a message. At this point, you must determine whether you want Access to delete the additional records, which you cannot undo later.

8.3 WORKING WITH FORMS

Q.30 Discuss the forms and control / control objects of Access.
Answer
Creating User Interface
Forms provide the user interface to your table. Although you can use datasheet view to perform many of the same functions as forms, forms offer the advantage of presenting data in an organized and attractive manner.
Forms
A form is a tool that makes it easy to view, modify or delete information stored in one or more tables in a database. You can also add new records using a form. You can arrange the location of fields on a form and alter entry or editing operations for a single record follow a left-to-right, top-to-bottom sequence.
Controls/Control Objects
Forms are composed of a collection of individual design elements called controls or control objects. Controls include text boxes, labels and frames. Controls are the components you see in the windows and dialog boxes of Access and other Windows applications. You use text boxes to enter and edit data, labels to display text such as titles or prompts, and frames to group controls. You can speed up the process of creating forms by selecting various options in the Forms group, which is on the Create tab of Access ribbon. We will use the Form Wizard to create a form.

8.3.1 CREATING, SAVING AND EDITING A FORM

Q.31 Write down the steps for creating form for the STUDENT table using form wizard.
Answer

Creating form from the STUDENT table
The following are the steps for creating form for the STUDENT table using Form Wizard:
1. Click the Create tab on the Access Ribbon as shown in Fig.8.19

Fig.8.19 Access ribbon with Create tab and Forms group on right side

2. Select More Forms from the Forms group.
3. Select Form Wizard from the drop-down list.
4. In the Form Wizard dialog box shown in Fig.8.20, select the STUDENT table from the Tables/Queries list box.

Fig.8.20 Form Wizard dialog box

5. Use the buttons as needed to move the name for each of the fields you want from the Available Fields list to the Selected Fields list.
6. Click the Next button to display the second Form Wizard dialog box shown in Fig.8.21.

Fig.8.21 Form Wizard dialog box for selecting layout

7. Select columnar layout for your form and click Next to open the dialog box shown in Fig. 8.2 for selecting form style.

Fig.8.22 Dialog box for selecting style

8. Select a form style and click Next button to open the final dialog box shown in Fig.8.23.

Fig.8.23 Dialog box for naming the form

9. Enter a title for your form and click Finish button. The opening options to open the form after it is saved and click the Finish button to save the form.
The final dialog box in the Form Wizard lets you assign a title to the form and choose the way the form is saved and opened. The default name for the form is the table name. You can change the name if you wish. Datasheet view if you selected Datasheet view layout so that you can immediately begin using the form to view or modify data. If you select the second opening option, the form will open in Design view so that you can modify its design.

Q.32 Describe the method for creating form for related tables.
Answer
Creating Form for Related Tables
Very often we need to view data form a table in related tables or queries at the same time. For example, we may want to see students' particulars from the STUDENT table and their results from the RESULT table in a single form.
To achieve the Access provides sub forms. We are going to create such a form using Form Wizard. Following are the steps:
1. Open the database that contains the records that you want to appear.
2. Click the Create tab and click Query Design to bring up the query design window.
3. Select the table that contains the records that you want to appear and click Add and then click Close.
4. Double click the fields that you want to appear so that they appear in the Field row on the design grid.
5. Enter the criteria Like "RI-7" in CLASS column as shown in Fig.8.24. The criteria will find all the records that contain a 5 letter string in which the first 4 letters are "RI-7" and the last letter is unknown for any section of class XI.

Fig.8.24 Query design grid showing select criteria

6. Click Append in the Query Type group of Design tab shown in Fig.8.25.

Fig.8.25 Selecting query type from Design tab

7. The Append dialog box shown in Fig.8.26 lets you specify the name of a table name to which you want to append the records. Choose to append records to a table in another database and enter the file name and then click the OK button.

Fig.8.26 Dialog box to select destination for appending records

Q.33 State the steps to create a make table query.
Answer
Creating a Make Table Query
A make table query retrieves records from a table and copies them into a new table. The new table can be in the database that you have open or you can create it in another database. To create a make table query, you first create a select query that specifies the data to be make table query. Choose a location for the new table and then run the query to create the new table.
The following are the steps to copy all the records of students having the data ISLAMABAD in the CITY field in a new table:
1. First create a select query that has the criteria ISLAMABAD in the CITY field column in the query design grid.
2. Click the Make Table in the Query Type group of Design tab. The Make Table dialog box will appear as shown in Fig.8.27.

Fig.8.27 Create Make table dialog box

3. If you want to place the new table in the current database, select Current Database otherwise act on the following. Choose and enter the location and file file name of the other database.
4. Click OK.
5. Click Run in the Results group of Design tab.

8.3 GENERATING REPORTS

Q.34 Describe report with respect to database.
Answer
Report
The final product of most database applications is a report. Access combines data in tables and queries to produce a report that you can print and distribute to people who need or request it. Reports

provide means for creating printed copies of the information in your database. Some reports consist of a single page, for example, a report that displays information about a particular product. Other reports span many pages. For example, mailing labels, Name tags, invoices, financial statements, sales reports, financial statements and examination result sheets.

8.3.1 CREATING A SIMPLE REPORT USING REPORT WIZARD

Q.35 Write down the steps to create the report.
Answer
We are going to create a simple report that will display all the fields of STUDENT table in ascending order of STD NAME in landscape portrait orientation.
Steps to create the report
Following are the steps to create the report:
1. Click the Create tab in the Access ribbon.
2. Click Report Wizard icon in the Reports group shown in Fig.8.28

Fig.8.28 Accessing Report Wizard from Reports group

3. Select STUDENT table in the Tables/Queries drop-down list.
4. Move all the fields from Available Fields list shown in Fig.8.29 to the Selected Fields list.

Fig.8.29 First screen of Report Wizard

5. Click Next.
6. Select STD NAME to sort the report by student name and select ascending order by clicking the button on the right side as shown in Fig.8.40.

Fig.8.40 Specifying sort order in Report Wizard

Access allows to sort records up to four fields and you can select Ascending or Descending order for these fields.
8. Click Next.
9. Select Tabular layout and Portrait orientation for the report as shown in Fig.8.41 and click Next.

Fig.8.41 Screen for selecting report layout and orientation

Select a report style from the list shown in Fig.8.42 and click Next.
10. Enter a title for the report as shown in Fig.8.43

Fig.8.43 Screen for entering report name

8.3.2 CREATING A REPORT USING A QUERY

Q.36 Describe the method for creating a report having a query.
Answer
Generally, database users use reports to display the results of a query, which is what are going to do. We know how to create relationship between the STUDENT table and the RESULT table in the Student Database Management System. These tables are having one-to-many relationship because a student can have many results in various exams. We want to see the results of all the students who passed in all the three subjects in the First Term Examination and their total marks. First we are going to create a query for this report.
Steps to Create the Query
The following are the steps to create the query:
1. Click the Create tab on the Access ribbon.
2. Click Query Design in the Other group to bring up the query design window.
3. Add both STUDENT and RESULT tables and close the Show Table dialog box.
4. Double click the fields STD NAME and CLASS from the field list of the table STUDENT and double click EXAMINATION, MATHS, PHYSICS AND COMPUTER in the box labeled RESULT.
5. To set up the criteria, you need to enter >32 below all the blank columns and FIRST TERM below EXAMINATION column in the Criteria row as shown in Fig.8.45.

Fig.8.45 Query design grid showing criteria

6. To create the total column, click the Field row in the first blank column on the right side of the design grid and enter the expression
MATHS+PHYSICS+COMPUTER
for calculating the total marks in the column.
7. The field name consists of Expr followed by a digit, indicating the sequence in which the calculated field was created. To change the field name, select the text before the colon and type the new name, TOTAL.
8. Save the query by clicking the save icon at the top left corner of the screen and give it the name CALCULATING TOTAL MARKS.
Now, we are going to create the Navigation Pane you will see the datasheet that displays records of all the students who have passed in all the three subjects along with the total marks as shown in Fig.8.46.

Fig.8.46 Datasheet view of query that displays records of students who have passed in all the three subjects along with the total marks

Steps to Create Report
The following are the steps to create the report.

Fig.8.47 Report Wizard icon in Reports group

1. Click the Create tab on the Access ribbon and click Report Wizard in the Reports group.
2. Select the query CALCULATING TOTAL MARKS from the drop-down list of Tables/Queries as shown in Fig.8.48.

Fig.8.48 Selecting query in report wizard

3. Move all the fields of query from the Available Fields list to the Selected Fields list using the buttons and click Next.
4. Click the Next button to accept the default for viewing the data.
5. Click the Next button to accept the default grouping level.

Fig.8.49 Screen for selecting grouping levels

6. Click the Next button to accept the default for report layout.

Fig.8.50 Screen for selecting report layout

7. Select the Aspect style for the report and click Next.

Fig.8.51 Screen for selecting report style

8. Give your report the title CALCULATION OF TOTAL MARKS and click Finish as shown in Fig.8.52.

Fig.8.52 Screen for entering report title

After clicking the Finish button, the report will be displayed on the screen as shown in Fig.8.51.

CALCULATION OF TOTAL MARKS

STUDENTID	STD NAME	CLASS	EXAMINATION	MATHS	PHYSICS	COMPUTER	TOTAL
1	ZAHEER	XI-A	FIRST TERM	75	80	90	245
2	MANSOOR	XI-B	FIRST TERM	70	65	70	205
4	KHURRAM	XI-A	FIRST TERM	87	92	90	269
6	ZEESHAN	XI-B	FIRST TERM	75	63	80	218

Fig.8.51 Report of students who passed in all three subjects along with their total marks

8.3.3 VIEWING AND PRINTING REPORT

Q.37 How do we view and print a report in Access?
Answer
Viewing a Report
When you create any database object, it is displayed in the Navigation Pane on the left side of the screen. To view the report, you just have to double click it.
Printing a Report
The following are the steps for printing a report:
1. Open the report that you want to print from the Access Navigation Pane by double clicking it.
2. Click the Microsoft Office button and then click Print. Keyboard shortcut for this command is Ctrl + P.
3. Specify the Print dialog box options and click Print to print your report.
If you want to quickly, print all the pages in the report without using the Print dialog box. Right click the report in the Navigation Pane and click Print. Access will print the entire report by using the default settings. Access prints the report on the default printer or displays specified for the report. You cannot change any of these properties when you use this option.

Q.38 Describe the formatting reports and forms.
Answer
Formatting Reports and Forms
Reports and forms are used to display information contained in your database and both use the same technique and tools to format their controls. These techniques include methods for moving and resizing controls, aligning controls, adjusting the spacing between controls, formatting and aligning text, adding borders and backgrounds, etc. To work with controls of a report or form, double click the report in the Navigation Pane. After opening the report or form, click the View button in the Home tab ribbon and select Design View. We can move any control to different position, change font size, style, color or change background & control, etc.

KEY POINTS

- Microsoft Office Access 2007 is a member of Microsoft Office 2007 integrated software and it is the most popular software used worldwide for developing and managing databases.
- It provides tool for creating tables, forms, queries and reports that make up a database.
- In Access, all the information of a database in stored in tables since it is a relational database management system.
- Seven types of data types are generally used in Access, which are text, memo, number, auto number, yes/no, currency and date/time.
- Access 2007 provides ribbon to alphabetically or numerically sort the records in a table in ascending or descending order.
- A form is a tool that makes it easy to enter, delete, modify and view the information stored in one or more tables in a database. It presents data in an organized and attractive manner.
- Query is a tool that answers questions about data to select specific information from tables and to perform selected tasks in

KEY POINTS

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- In Access, all the information of a database in stored in tables since it is a relational database management system.
- Seven types of data types are generally used in Access, which are text, memo, number, auto number, yes/no, currency and date/time.
- Sorting feature of Access allow to alphabetically or numerically sort the records in a table in ascending or descending order.
- A form is a tool that makes it easy to enter, delete, modify and view the information stored in one or more tables in a database. It presents data in an organized and attractive manner.
- Query is a tool that answers questions about data to select specific information from tables and to change selected data in various ways. It lets you see the data you want and in the order, you want it.
- Report is a database object that organizes and formats data stored in tables or queries to make it presentable and meaningful to other people. Reports are used to print data stored in tables and queries, which is an essential part of using a database.
- Columnar report displays each field of a record on a separate line with a label to its left. It spreads the information for a single record over many rows.
- Tabular reports display fields of records in a horizontal row with field labels at the top of the report.

EXERCISE

Q1. Select the best answer for the following MCQs.

i. Which of the following is used to gather information based on one or more criteria?
A. Table B. Form C. Query D. Report

ii. Which data field type is used to provide descriptive comments?
A. Text B. Memo C. Autonumber D. Yes/No

iii. Selecting records in a table which match a given criteria is known as:
A. Sorting data B. Searching data C. Updating data D. Filtering data

iv. The maximum number of records in a table that can use the Autonumber field is slightly more than:
A. 1 Million B. 1 Billion C. 2 Billion D. 3 Billion

v. Which database object stores all the information of a database?
A. Table B. Form C. Query D. Report

vi. What is the default value of number of characters for Text data type in Access?
A. 30 B. 40 C. 50 D. 60

vii. Which query is used to add records from a table to another table?
A. Select query B. Update query C. Append query D. Make Table query

viii. Which query is used to change data in existing records?
A. Select query B. Update query C. Append query D. Make Table query

ix. In which tab of Access ribbon Relationships icon is located?
A. Home B. Create C. External Data D. Database Tools

x. In which tab of Access ribbon Query Design icon is located?
A. Home B. Create C. External Data D. Database Tools

Answers

i.	C	ii.	B	iii.	D	iv.	C	v.	A
vi.	C	vii.	C	viii.	B	ix.	D	x.	B

Q2. Give short answers of the following questions.

i. Which tasks can be performed using Microsoft Office Button?

Answer

Tasks performed using Microsoft Office Button

By using Microsoft Office Button following tasks can be performed:

1. Saving
2. Opening
3. New file creation
4. Printing

ii. Describe various ways of deleting records in a table.

Answer

Deleting Records from a Table

The following are the steps for deleting records from a table:

1. Open the table from which you want to delete record.
2. Select the record you want to delete by clicking its row selector box, which is on the left end of the row.
3. Press the Delete key or choose Delete from the Records option on the Home tab.
4. Click the Yes button to proceed with the deletion in the dialog box that appears.

Ways of deleting records

You can select and delete multiple records by selecting them by clicking the row selector and dragging it up or down and then pressing the Delete key.

Once you delete a record and click Yes button to confirm your action, you will not be able to restore the record. You cannot undo a record deletion by choosing Undo from the Quick Access Toolbar. If you ever want to restore a deleted record, you will have to re-enter it from the scratch.

One or more columns of a table can be deleted in a similar way as deleting records. Keep in mind the distinction between deleting a row (record) which is all the fields of information about a single entry and deleting a column for every record in the table. It is generally easier to re-enter a record than a field for all the records.

When a record in a table is deleted that is related to another table, Access might need to delete one or more records in the related table to enforce referential integrity. Before doing so it will display a message. At this point, you must determine whether you want Access to delete the additional records, which you cannot currently see.

iii. What are the advantages of using forms?

Answer

Advantages of using forms

The advantage of using form is presenting data in an organized and attractive manner.

iv. What is meant by referential integrity?

Answer

Referential Integrity

Referential integrity enforcement prevents you from deleting or modifying values of a primary table's record on which related records depend.

v. Describe how records can be added and deleted using forms.

Answer

Adding new record using forms

To create a new record, click the New Record button that contains the asterisk on the Toolbar at the bottom of the form window or click the New Record button in the Records group of Home tab. The new record will be added to the end of the table and will be displayed in the form window so that you can enter information into it.

Deleting record using forms

To delete a record, first display it in the form window and then choose Delete Record from the Records group of Home tab ribbon. Once you delete a record, the data is permanently lost and it cannot be restored using the Undo command.

vi. Describe columnar, tabular and datasheet layouts of forms.

Answer

Columnar Layout

Columnar layout of form aligns all fields in columns.

Tabular Layout

Tabular layout of form creates a form that looks like a table.

Datasheet Layout

Datasheet layout creates a form that looks like a datasheet.

vii. What is the use of Query Design grid?

Answer

Use of Query Design grid

Query Design grid is used to stores a particular type of data.

viii. What is OpenOffice Base?

Answer

OpenOffice Base

OpenOffice Base is the database module of OpenOffice Suite. It is an open source application program. OpenOffice Base is a fully featured database management system.

ix. Differentiate between update and append query.

Answer

Difference between update and append query:

Update Query	Append Query
Update queries are used to change, add or delete data in existing records. You cannot use an update query to add records to or delete records from a table but you use it to change existing null values to non-null values and non-null values to null values.	Append query is used to add records from a more source table to a destination table. Very often, the source and destination tables are in the same database. Append queries are not used to change the data in individual fields in existing tables.

x. Differentiate between columnar and tabular reports.

Answer

Difference between columnar and tabular reports:

Columnar report	Tabular reports
Columnar report displays each field of a record on a separate line with a label to its left. It spreads the information for a single record over many rows.	Tabular reports display fields of records in a horizontal row with field labels at the top of the report.

Q3. Give long answers of the following questions.

i. Explain the following database objects.

- Tables
- Forms
- Queries
- Reports

Answer

Tables

Access stores all the information of a database in one or more tables. Information stored in tables is very similar to the Excel worksheet. Information in tables is organized in rows and columns.

Forms

A form is a window that is used for viewing, modifying or deleting data that is stored in tables and for adding new data.

Queries

Queries are used to gather selected information from a database and organize it either for use in reports or for viewing on screen. A query can combine information from multiple tables.

Reports

Reports are used for printing information from a database. A report can combine data from more than one table.

ii. Explain the field data types used in Access.

Answer

Data Types in Access

There are seven types of field data types, which are commonly used in Access.

- Text
- Memo
- Number
- AutoNumber
- Yes/NO
- Currency
- Date/Time

1. Text

Text fields are most common, so Access assigns Text as the default data type. A Text field can contain as many as 255 characters and you can designate a maximum length less than or equal to 255. Access assigns a default length of 50 characters.

2. Memo

Memo fields ordinarily contain as many as 65,535 characters. You use them to provide descriptive comments. Access displays the contents of Memo fields in a Datasheet view. A memo field cannot be a key field.

3. Number

Various numeric data subtypes are available in the Field Properties pane of Table Design window. Choose the appropriate data subtype by selecting one of the Field Size property settings. You specify how to display the number by setting its Format property to one of the formats.

4. AutoNumber

An AutoNumber field is a numeric (Long Integer) value that Access automatically fills in for each new record you add to a table. Access can increment the AutoNumber field by 1 for each new record or fill in the field with a randomly generated number, depending on the New Values property setting that you choose. The maximum number of records in a table that can use the AutoNumber field is slightly more than 2 billion.

5. Yes/No

Logical fields in Access use -1 for Yes (True) and 0 for No (False). You use the Format property to display Yes/No fields as Yes or No, True or False, On or Off or -1 or 0.

6. Currency

Currency is a special fixed format with four decimal places designed to prevent rounding errors that would affect accounting operations where the value must match to the penny.

7. Date/Time

Dates and times are stored in a special fixed format. The whole number portion of the Date/Time value represents the date and the time is represented by its decimal fraction. You control how Access displays dates by selecting one of the Date/Time Format properties.

Additional Properties of a Table Field

Depending on the specific data type that you choose for a field, you can set additional properties for a table field. You set these additional properties on the General page of the Table Design window's Field Properties pane by selecting from drop-down or combo lists or by typing values in text boxes.

Saving Data in Table

When you have defined all the fields that you want to include in your table, you must save it. When you close the Table Design window, it will ask you whether you want to save it or not. Select save and give your table a name. You can also save it by clicking the save icon on the top left corner of the screen.

iii. Describe how forms are created.

Answer

Steps for creating the form

Following are the steps for creating the form shown in Fig.8.24 for the related tables, STUDENT and RESULT, in Student Database Management System.

1. On the Create tab of Access ribbon, click More Forms in the Forms group and select Form Wizard from the drop-down list.
2. Select the STUDENT table in the Tables/Queries drop down list in the first dialog box.

Fig. 8.24 Form for related tables of student database management system

3. Move all the fields of STUDENT table from the Available Fields list to the Selected Fields list using the buttons.
4. In the same dialog box, select the RESULT table also and move all the fields to the Selected Fields list to see them in the sub form and click the Next button.
5. The wizard will ask you how you want to view your data. Select by STUDENT and also select Form with sub form(s), which is the default choice and click the Next button.
6. Select the Datasheet layout for your sub form and click the Next button.
7. Select a style that you like and click the Next button.
8. Type the title STUDENT DATA ENTRY FORM for the form and RESULT for the sub form and click Finish button to save it.

iv. Write the steps for creating relationships between tables.

Answer

The connection between a field in one table and a field in another table must be defined within

Access. Such a definition is known as a relationship and each of the fields is said to be related to the other field. Once a relationship has been designated, Access can help you maintain the integrity of the related data and can make it easier to access related data. Relationships also allow you to create queries, forms and reports that display information from several tables at once.

Creating Relationship between STUDENT and RESULT Tables

We are going to create a one-to-many relationship between the STUDENT table and the RESULT table. This requires that primary key field, STUDENTID of the STUDENT table must have a unique value but the values in the foreign key field, RESULTID can match many entries in the related field of the existing table to represent results of various examinations. Note that the data type for STUDENTID should be AutoNumber and the data type of RESULTID should also be a number but it can have duplicate values.

Steps for creating relationship

The steps for creating relationship between are given below tables:

1. Click the Relationship icon in the ribbon of Database Tools as shown in Fig.8.13

Fig.8.13 Icon for creating relationship

2. Click the STUDENT table and click the Add button shown in Fig.8.14

Fig.8.14 Show Table dialog box for adding tables

3. Click the RESULT table and click the Add button.
4. Click the Close button to close the dialog box.
5. Move the mouse pointer to the primary key STUDENTID and drag it to the foreign key RESULTID in the RESULT table.

v. Describe the types of queries that can be created in Access.

Answer

The following are five types of queries, that can be created in Access.

- Select Query
- Update Query
- Delete Query
- Append Query
- Make Table Query

Creating a Select Query

The following are the steps for creating a Select Query that will display all the records of STUDENT table in which the CITY field is ISLAMABAD.

1. Click the Create tab.

2. Click the Query Design icon in the Other group to bring up the query design window.
3. Add the STUDENT table and close the Show Table window.
4. Double click all the fields one by one in the box labeled STUDENT above the query design grid. The field names will appear at the top of each column in the query design grid.
5. Enter the criteria ISLAMABAD in the Criteria row in the CITY column as shown in Fig.8.29.

Fig.8.29

6. Click the Save icon above the Access ribbon to save the query. When you are prompted for the query name, enter STUDENTS LIVING IN ISLAMABAD and click OK.
7. To run the query, click the query name in the Navigation Pane on the left side of the screen. You will see a datasheet displaying records of all the students who live in Islamabad as shown in Fig.8.30. You can also run the query without saving it. After creating the select query, click Run in the Results group of Design tab on Access Ribbon.

Fig.8.30 List of students living in Islamabad

Creating an Update Query

Update queries are used to change, add or delete data in existing records. You cannot use an update query to add records to or delete records from a table but you use it to change existing null values to non-null values and non-null values to null values.

We are going to create an update query that will update the CITY field of all the records that have the data ISLAMABAD in the STUDENT table to LAHORE. The easiest way to create an update query is to first create a select query and then convert it into an update query.

Steps to create update query

The following are the steps to create update query:

1. First create the select query with the criteria ISLAMABAD in the CITY column.
2. On the Design tab in the Query Type group as shown in Fig.8.31 click Update.

Fig.8.31

3. Access will add the Update To row in the query design grid as shown in Fig.8.32. Type LAHORE in the CITY column in the Update To row.
4. Click the Save icon on the top left corner of the screen.
5. Type a name for the query and click OK.

6. Double click the query in the Navigation Pane to see the result.

Fig. 8.32 Query Design grid for creating Update Query

Creating a Delete Query

Delete queries are used to delete entire records from tables along with the primary key. The process of creating a delete query using query design window is very similar to creating update query. To do this, first create a select query to select the records that you want to delete and then convert it into a delete query.

Suppose in our Student Database Management System we want to delete records of all the students of class XI-B.

The following are the steps to create this query.

1. First create the select query with the criteria XI-B in the CITY column.
2. On the Design tab in the Query Type group shown in Fig.8.33, click Delete. This will hide the Show row in the lower section of the design grid and add the Delete row.

Fig.8.33 Creating a delete query

3. To delete the selected records, click Run in the Results group of Design tab. Access will ask you to confirm your action, click Yes to confirm.

To delete related data in tables, determine which records are on the "one" side of the relationship and which on the "many" side. If you want to delete records on the "one" side of the relationship and the records on the "many" side, you must enable Referential Integrity and cascading delete. If you need to delete records only on the "one" side of the relationship, you first delete that relationship and then delete the data. If you need to delete records only on the many side of the relationship, you can create and run your delete query without having to change the relationship.

Creating an Append Query

Append query is used to add records from a more source table to a destination table. Very often, the source and destination tables are in the same database. Append queries are not used to change the data in individual fields in existing tables. For this, we use update query. When appending records in table, make sure that the data types you set for the fields in the source table are compatible with the data types that you set for the table fields in the destination table.

An easy way to create an append query is first create the select query and then convert it into an append query as we did for creating an update and delete query.

The following are the steps to create an append query to append records of students of any section of class XII to a table in another database.

1. Open the database that contains the records that you want to append.
2. Click the Create tab and click Query Design to bring up the query design window.
3. Select the table that contains the records that you want to append and click Add and then click Close.
4. Double click the fields that you want to append so that they appear in the Field row on the design grid.
5. Enter the criteria Like "XII-?" in CLASS column as shown in Fig.8.34 The criteria will find all the records that contain a 5 letter string in which the first 4 letters are "XII-" and the last letter is unknown for any section of class XII.

Fig.8.34 Query design grid showing append criteria

6. Click Append in the Query Type group of Design tab shown in Fig.8.35.

Fig.8.35 Selecting query type from Design tab

7. The Append dialog box shown in Fig.8.36 will appear. Enter the table name in which you want to append the records. Choose to append records to another database and enter the file name and then click the OK button.

Fig.8.36 Append dialog box for appending records.

Creating a Make Table Query

A make table query retrieves records from a table and copies them into a new table. The new table can be in the database that you have open or you can create it in another database. To create a make table query, first create a select query and then convert it into a make table query. Choose a location for the new table and then run the query to create the new table.

The following are the steps to copy all the records of students having the data ISLAMABAD in the CITY column of STUDENT table.

1. First create a select query that has the criteria ISLAMABAD in the CITY field column in the query design grid.
2. Make Table in the Query Type group of Design tab. The Make Table dialog box will appear as shown in Fig.8.37.

Fig.8.37 Make Table dialog box

3. If you want to place the new table in the current database, select Current Database otherwise .act Another Database and enter the location and the file name of the other database.
4. Click OK.
5. Click Run in the Results group of Design tab.

LAB ACTIVITIES

Following lab activities are to be carried out during the practical periods.

1) Students should know how to launch Access and create and save a database.

Answer

Practical Work

2) Creation of following database objects should be demonstrated on the computer:

- **Table**
- **Form**
- **Query**
- **Report**

Answer

Practical Work

3) Following operations should be performed on the computer.

- **Entering, deleting and modifying of data in records**
- **Filtering records**
- **Sorting records**
- **Searching records**

Answer

Practical Work

4) Creating and editing relationships between tables.

Answer

Practical Work

5) Formatting and printing forms and reports.

Answer

Practical Work

Q.1 Select the correct choice from the following questions.

1. **There are _____ types of relational database management systems:**
   A. Two B. Three C. Four D. Five
2. **It is one of the popular database software by Microsoft:**
   A. Microsoft Access B. Microsoft Word
   C. Microsoft PowerPoint D. Microsoft Excel
3. **It stores all the data of a database:**
   A. Report B. Table C. Form D. Query
4. **It is a window that displays data for viewing, entering and editing information:**
   A. Report B. Table C. Form D. Query
5. **It is used to gather information based on one or more criteria:**
   A. Report B. Table C. Form D. Query
6. **It is used for printing information from database:**
   A. Report B. Table C. Form D. Query
7. **Microsoft Access is a:**
   A. RDBMS B. OODBMS
   C. ORDBMS D. Network Database Model
8. **Access assigns this data type as the default data type:**
   A. Number B. AutoNumber C. Text D. Memo
9. **A Text field can contain _____ characters:**
   A. 255 B. 200 C. 355 D. 155
10. **Access assigns a default length of _____ characters:**
    A. 40 B. 50 C. 60 D. 70
11. **Memo fields ordinarily contain as many as _____ characters:**
    A. 65,555 B. 75,535 C. 65,535 D. 85,535
12. **You use them to provide descriptive comments:**
    A. Number B. AutoNumber C. Text D. Memo
13. **It is a numeric (Long Integer) value that Access automatically fills in for each new record you add to a table:**
    A. Number B. AutoNumber C. Text D. Memo
14. **Access can increment the AutoNumber field by _____ for each new record:**
    A. 1 B. 2 C. 3 D. 4
15. **There are _____ basic types of forms depending on the layout:**
    A. Three B. Four C. Five D. Six
16. **While working in forms, to move back to the previous control press:**
    A. Shift+Tab B. Ctrl+Tab C. Alt+Tab D. F3+Tab
17. **This query is used to change, add or delete data in existing records:**
    A. Select Query B. Update Query C. Delete Query D. Append Query
18. **This query is used to delete entire records from tables along with the primary key:**
    A. Select Query B. Update Query C. Delete Query D. Append Query
19. **This query is used to add records from a more source table to a destination table:**
    A. Select Query B. Update Query C. Delete Query D. Append Query

Answers:

1.	Three	**2.**	Microsoft Access
3.	Table	**4.**	Form
5.	Query	**6.**	Report
7.	RDBMS	**8.**	Text
9.	255	**10.**	50
11.	65,535	**12.**	Memo
13.	AutoNumber	**14.**	1

15.	Shift+Tab	**16.**	Update Query
17.	Update Query	**18.**	Delete Query
19.	Append Query		

Q.2 Give short answers of the following questions.

Q1: Why databases are developed?
Ans. Databases are developed to provide facilities to store, manage and retrieve information in an organized way.

Q2: Why relational databases are successful in organizations?
Ans. Relational databases have been very successful in organizations for managing databases. In relational databases, data is stored in tables. The relations between the tables make it a relational database.

Q3: Which things are included in the creation database objects?
Ans. Database development includes the creation of database objects (tables, forms, queries, reports, etc.), keys and relationships between the tables

Q4: Name the Types of Relational Database Management Systems (RDBMS).
Ans. There are three types of relational database management systems (RDBMS). These are:
- ⇨ Microsoft Access
- ⇨ OpenOffice Base
- ⇨ SQL Server

Q5: Write down the use of OpenOffice Base.
Ans. OpenOffice Base allows users to create interactive databases where they can manage data related to payroll, inventory, assets, budgets, customers, sales orders and invoices, etc..

Q6: Give a brief introduction of SQL Server.
Ans. SQL Server is a product of Microsoft Office. SQL Server is a relational database management system that offers a variety of tools for database development, maintenance and administration.

Q7: Write down the function and use of SQL Server.
Ans. Main function of SQL Server is to store and retrieve data as requested by other software applications. It is also used to create and manage Web-based databases.

Q8: State the function of Microsoft Office Button.
Ans. The Microsoft Office Button performs tasks such as saving, opening, new file creation and printing, etc..

Q9: Write down the steps for launching Access 2007.
Ans. Following steps are used for launching Access 2007:
1. Click the Start button on the Windows taskbar.
2. Click All Programs on the Start menu.
3. Click Microsoft Office on the All Programs submenu.
4. Click Microsoft Office Access 2007 to launch Access 2007 and display the Getting Started with Microsoft Office Access screen.

Q10: What are the objects which are used in Access?
Ans. The following are the main objects used in Access:
- ⇨ ables
- ⇨ Forms
- ⇨ Queries
- ⇨ Reports

Q11: What is a form?
Ans. A form is a window that is used for viewing, modifying or deleting data that is stored in tables and for adding new data.

Q12: Why queries are used?
Ans. Queries are used to gather selected information from a database and organize it either for use in reports or for viewing on screen. A query can combine information from multiple tables.

ABBREVIATIONS

ATM	Automated Teller Machine	**BIOS**	Basic Input Output System
BIPS	Billion Instructions Per Second	**CD**	Compact Disk
CISC	Complex Instruction Set Computer	**CRT**	Cathode Ray Tube
DBA	Database Administrator	**DBMS**	Database Management System
DIMM	Dual In-line Memory Module	**DRAM**	Dynamic Random Access Memory
DSL	Digital Subscriber Line	**DVD**	Digital Video Disk
EEPROM	Electrically Erasable Programmable Read Only Memory	**EPROM**	Erasable Programmable Read Only Memory
GB	Gigabyte	**GPS**	Global Positioning System
IBM	International Business Machines	**IC**	Integrated Circuit
IP	Internet Protocol	**ISDN**	Integrated Services Digital Network
ISO	International Standards Organization	**KB**	Kilobyte
LAN	Local Area Network	**LCD**	Liquid Crystal Display
LSI	Large Scale Integration	**MAN**	Metropolitan Area Network
MB	Megabyte	**MIPS**	Million Instructions Per Second
MSI	Medium Scale Integration	**NIC**	Network Interface Card
OSI	Open System Interconnection	**PDA**	Personal Digital Assistant
PROM	Programmable Read Only Memory	**PSTN**	Public Switched Telephone Network
RAM	Random Access Memory	**RDRMS**	Relational Database Management System
RISC	Reduced Instruction Set Computer	**ROM**	Read Only Memory
SATA	Serial Advanced Technology Attachment	**SDRAM**	Synchronous Dynamic Random Access Memory
SIMM	Single In-line Memory Module	**SSI**	Small Scale Integration
TB	Terabyte	**TCP**	Transmission Control Protocol
TIPS	Trillion Instructions Per Second	**USB**	Universal Serial Bus
VLSI	Very Large Scale Integration	**VPN**	Virtual Private network
WAN	Wide Area Network	**WWW**	World Wide Web

GLOSSARY

Application software	A set of programs designed to perform a specific task, such as typing a letter, preparing payroll, playing music or creating animated display.
Assembler	A system software that translates assembly language programs into machine language for execution by the computer.
Asynchronous Transmission	A type of transmission in which the time interval between the characters being transmitted varies.
Attribute	A property or characteristics of an entity.
Bus Topology	A type of topology in which the transmission medium is usually a single cable to which all the devices are attached.
Cache Memory	Small amount of high-speed semiconductor memory which exists inside the microprocessor or on the motherboard of a computer.
Circuit Switched Network	A mode of operation of a network in which communication path is first established between the source and the destination and used exclusively for the duration of the call or transaction.
Client	A computer on the network that accesses resources that are shared by other computers.
Client/Server Network	A computer network in which each computer on the network acts as either a server or a client.
Communication Media	Communication lines used to transmit data between computers, such as telephone line, fiber optics or coaxial cable.
Compiler	A system software that translates entire program written in a high-level language into machine language program for execution by the computer.
Computer Casing	A box or an enclosure that contains most of the components of a computer except the input/output devices.
Computer Network	An interconnection between two or more computers so that they can communicate with each other.
Computer Program	A sequence of instructions which are stored in main memory of a computer and specify which operations are to occur to solve a problem.
Control Unit	A unit of CPU that directs and coordinates the operations of entire computer system.
Data File	A collection of records.
Data Inconsistency	The same items of data held in many different files having different values.
Data Redundancy	The same data duplicated in many different data files.
Database	A collection of related data in data files or tables.
Database Management System (DMBS)	A general-purpose software that allows users to create and maintain a database.
Database Administrator	A person incharge of a group who is responsible for supervising both the database and the use of DBMS
Database	A collection of many different data files linked in such a way that information can be retrieved from several files simultaneously.
Device Driver	A computer program whose purpose is to control the operation of a hardware device attached to computer.

Digital Computer	A machine that can solve problems by carrying out instructions given to it in a computer programming language.
Direct Access Memory	A type of memory in which the actual physical location of a memory word has no effect on how long it takes to read from or write into that location.
Entity	A thing of interest to an organization about which data is to be held.
Entity-Relationship (E-R) Diagram	A diagrammatic way of representing the relationship between entities in a database
Firmware	An intermediate form between hardware and software which consists of software embedded in electronic devices during their manufacture.
Form	A window that displays a collection of controls, such as labels, text boxes, check boxes and lists for viewing, entering and editing the information in database fields.
Freeware	Software distributed free of cost like shareware but it is usually full version of the software for an unlimited period of time.
Full-duplex Mode	A type of information exchange method between two communicating devices, whereas, information can be exchanged in both directions simultaneously.
Gateway	A device that is used to link very different kinds of networks, such as a network of IBM mainframe computers and a network of PCs.
Half-duplex Mode	A type of information exchange method between two communicating devices, whereas, information can be exchanged in both directions alternatively.
Hardcopy	Output generated by an output device, such as printer on paper that is permanent record of information and cannot be changed.
Hardware	Physical components of computer, such as monitor, keyboard, hard disk, printer, along with the circuitry connecting them.
Hierarchical Database Model	A database model in which data is organized into a tree-like structure.
Hyper Text Markup Language(HTML)	The major language of the Internet's World Wide Web to write web pages.
IC Chip	A silicon chip that consists of miniature logic circuits etched on it.
Interpreter	A system software that translates high-level language program into machine language but it translates one instruction at a time and executes it before translating the next instruction.
IP Address	A unique address made up of 32 bits that identifies a host on Internet.
ISO	International Standards Organization based in Geneva that develops standards for various devices.
Local Area Network (LAN)	A network that consists within a limited geographical area such as a building or a university campus.
Memory Address	A number that points at a location of a word in memory.
Metropolitan Area Network(MAN)	A backbone network of fiber optic cables that could span hundreds of square miles within a city.
Microprocessor	A single VLSI chip that directs and coordinates the operation of all the other part of computer.
Modulation	The process of transmitting a sequence of 1s and 0s by varying amplitude or frequency of a sine wave.

Motherboard	A circuit board that connects all the components of computer system through ports, cables or expansion slots.
Network Database Model	A hierarchical database model in which some of the data elements can have more than one owner data element
Object-Oriented Database Model	A database model that stores objects rather than data, such as integers, real numbers and strings. Objects are used in object-oriented programming languages, such as C++ and Java.
Open Source Software	Computer software that is available in the form of source code that allows users to study, change and improve it.
Operating System	A system software that manages the hardware and software resources of a computer system, such as CPU, storage and all the input devices.
OSI	Open System Interconnection is a standard model of a data communication system developed by ISO to facilitate communication system in which equipment from different vendors can communicate with each other.
Packet Switched Network	A mode of operation in which each message transmitted through the network is first divided into a number of smaller units known as packets. Each packet contains addressing information and the packets are reassembled at the destination.
Peer-to-Peer Network	A network in which every computer is capable of playing the role of client, server or both at the same time.
Plotter	An output device used to produce hardcopy of graphs, maps, engineering drawings and machine components
Port	Connectors at the back of motherboard that provide interface for communication between the microprocessor and input/output devices.
Primary Key	A unique field of an entity in a database.
Protocol	A language or set of rules that nodes agree to use to communicate over a network
Query	An object used to gather selected information from a database and organize it either for use in reports or for viewing on screen.
Record	All the information about one person or item.
Referential Integrity	A feature in DBMS that prevents from deleting or modifying values of a primary table's record on which related records depend.
Register	Small storage unit whose function is to temporarily store binary information and pass it on to the other parts of the processor or main memory during the execution of program instructions.
Relational Database Model	A database model in which data is held in tables and the tables are linked by means of common fields.
Relationship	A link or association between entities.
Resolution	The sharpness or quality of picture or text displayed on monitor or printed on printer
Ring Topology	A type of topology in which each computer is connected to its nearest neighbor until all the computers are connected in the form of a ring
Router	A device that reads network addressing information in the packet and may add more information to get it through the network.
Secondary Key	If a database table needs to be searched on a field other than the primary key, it is known as a secondary key.

Sequential Access Memory	A type of memory in which the access time is not constant but varies depending on the address location.
Server	A computer on the network that shares resources for others to use.
Shareware	A proprietary software that is given to people free of charge in a compact disk along with periodicals or magazines or it can be downloaded from a website.
Simplex Mode	A type of information exchange method between two communicating devices whereas information can be passed only in one direction.
Softcopy	Output that appears on a monitor or is saved on some medium, such as hard disk, CD or flash drive.
Software	See definition of computer program.
Software License	A contract between the producer and the user of computer software that specifies the perimeters of permission granted by the owner to the user.
Star Topology	A type of topology in which there is a central computer that performs all the switching functions.
Switch	A device that links cable segments of a LAN, links two LANs or links the cable of LAN to leased lines, such as telephone lines.
Synchronous Transmission	A type of transmission in which the time interval between characters being transmitted is constant.
System Bus	A group of parallel strands of wires for transmitting binary information in the computers.
System Software	Collection of operative programs whose purpose is to make the use of computer easy and effective.
System Unit	A computer casing with all the components, such as motherboard, CPU, main memory and hard disk installed inside it.
Topology	A map of layout of nodes and connections in a network.
Utility Software	Software that provides facilities to carry out tasks which are beyond the capabilities of the supervisor of operating system.
Virtual Private Network (VPN)	A network that provides remote access to individuals or offices to their organization's networks by using public telecommunication infrastructure such as Internet.
Wide Area Network (WAN)	A network that spans a large physical area, connecting computers across cities, countries and continents.
Wireless Network	A network that uses electromagnetic waves to provide facilities to computer users to exchange information without additional wiring network.