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
- 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

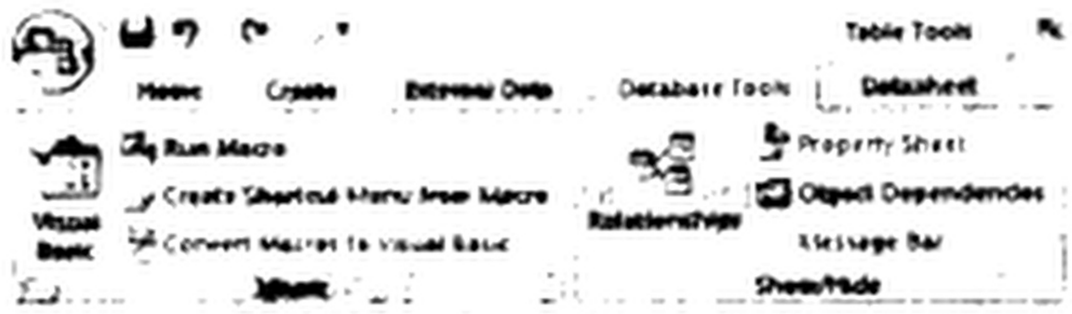

Fig.8.13 Icon for creating relationship

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.

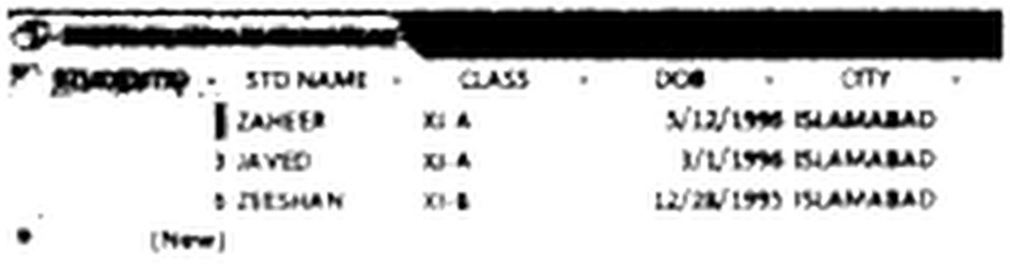

Fig.8.29

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.

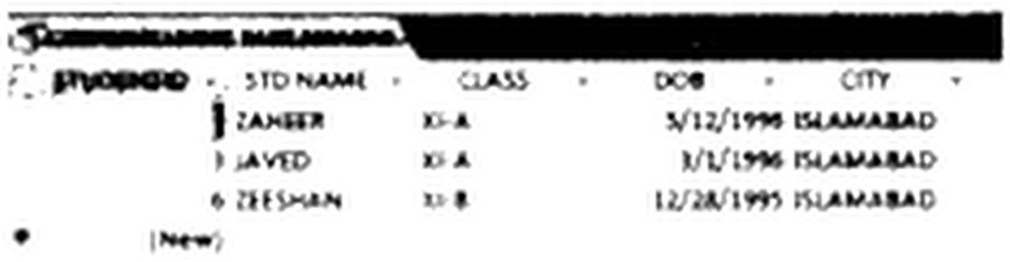

Fig.8.30 List of students living in Islamabad

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.

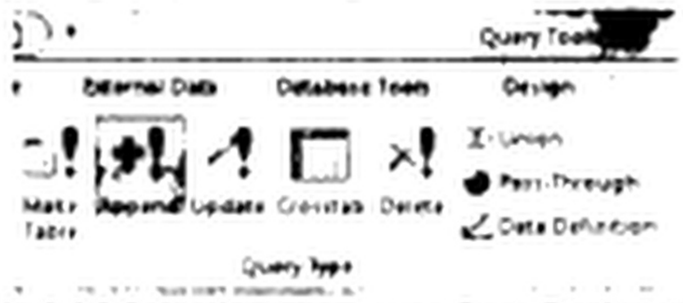

Fig.8.35 Selecting query type from Design tab

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.

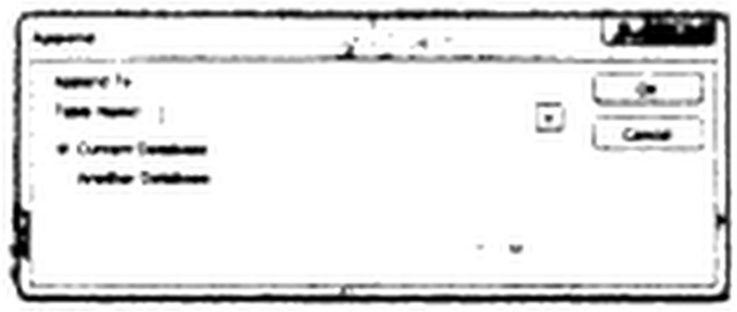

Fig.8.36 Append dialog box for appending records.

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