CHAPTER-6
MORE ABOUT CLASSES AND LIBRARIES

Brief Summary of the Chapter:

In this chapter the way access of members of a class i.e. about access specifier will be discuss. Java include predefined classes in the form of packages which are also called Java class Library. Some of the used packages are: java.lang. java.util, java.io, java.swing. java.awt, java.applet etc.

Key points:

- The public member of object are accessed through .(dot) operator.
- The private members are accessible only inside their own class.
- The protected members are accessible inside their own class, sub class and packages.
- The default members are accessible inside their own class as well to classes in the same package.
- Related classes and interfaces are grouped together in the form of package.
- Packages and class are imported through import command.

SOLVED QUESTIONS

1. Which keyword can protect a class in a package from accessibility by the classes outside the package?

(a)private (b)protected (c) final (d) None of these

Ans: (d) None of these.

2. We would like to make a member of a class visible in all subclasses regardless of what package they are in. Which one of the following keywords would achieve this?

(a)private (b)protected (c) final (d) public (e) None of these

Ans: (b) protected.

3. Which of the following keywords are used to control access to a class member?

(a) default (b) abstract (c)protected (d) interface (e) public.

Ans: (c) and (e) public

4. The public members of objects are accessed through which operator.

(a) arrow (b) dot (c) this (d) none of these

Ans: (b) dot

5. The private members are accessible only inside their _____class.

(a) own (b) sub (c) super (d) none of these

Ans: (a) own

6. Which command is used to import packages and their classes?

(a) include (b) import (c) public (d) inline

Ans: (b) import

7.Which statement is used to create a package in Java?

(a) Class (b) super (c) this (d) package

Ans:(d) package

8. In Java, all strings are objects?

(a) True (b) False (c) don't say

Ans: (a) True

9. What do you understand by Package in Java?

Ans: A group of classes is called package

10.Given a package named EDU. Student, how would you import a class named Test contained in this package? Write one line statement.

Ans: import EDU.Student.Test;

11. What will be the output of the following code

```
StringBuffer city = new StringBuffer("Madras");

StringBuffer string = new StringBuffer();
string.append(new String(city));
string.insert(0,"Central");
string.out.println(string);
```

Ans: CentralMadras.

12. Give the output of the following program:

```
class MainString
{ public static void main( String agrs[])
        { StringBuffer s = new StringBuffer("String");
                if(s.length() > 5) && (s.append("Buffer").equals("x");
                        System.out.println(s);
        }
}
```

Ans: StringBuffer.

13. What is the output of the following code fragment if "abc" is passed as argument to the func()?

```
Public static void func(string s1)
{
String s = s1 + "xyz";
System.out.println("s1=" + s1);
System.out.println("s = " +s);
}
```

Ans: s1= abc

s =abcxyz

14.What are the access specifiers in Java? Expalin.

Ans: The Access Specifiers control access to members of class from / within Java Program. Java supports various Access Specifiers to control the accessibility of class members.

 Private : A variable or method declared as private, may not be accessed outside of the class. Only class member can access them, since they are private to others.

 Protected: Protected members can be accessed by the class members and subclasses (derived classes) and current package, but they are not accessible from beyond package or outside.

 Public: Class members declared as public, are accessible to any other class i.e. everywhere , since they are public.

 Package (default): If no any specifier is mentioned, default or friendly access is assumed. Class member may be accessed by any other Class members available in the same package, but not accessible by the other classes outside the package, even subclasses.

15. What do you meant by private, public, protected, package(friendly) access specifiers?

Ans: **Private Access Specifier**

Members declared as private are accessible by the members of the same class, since they are private. A private key word is used to specify.

//e.g to demonstrate private specifier.//

class abc

```
{ private int p;
private void method1()
{ p=10;
system.out.print("I am Private method");
}
}
class xyz
{…….
void method2()
{ abc x = new abc();
x.p =10;
x.method1() ;
}
}
```

Protected Access Specifier

Protected members are accessible by all the classes in the same package and sub-classes (same of different packages). A protected key word is used to specify.

```
Package mypackage;
class abc
{ protected int p;
protected void method1()
{ p=10;
system.out.print("Protected
method");
}
}
class xyz
{…….
void method2()
{ abc x = new abc();
x.p =10;
x.method1() ;
}
}
```

Lets another Package…

```
package yourpackage;
import mypackage.*;
class pqr extends abc
{ void method3()
{ abc x=new abc();
pqr y=new pqr();
x.p=10;
x.method1();
y.p=10;
y.method1();
}
}
```

Public Access Specifier

Public Members can be access at anywhere i.e. same or different package. A public key word is used to specify.

```
packagemypackage;
class abc
{ public int p;
public void method1()
```

```
{ p=10;
system.out.print("Public method");
}
}

package yourpackage;
import mypackage.* ;
class xyz
{…….
void method2()
{ abc x = new abc();
x.p =10;
x.method1() ;
}
}
```

Package (friendly) Access Specifier

If no specifier is explicitly specified, Java assumes default (friendly) access i.e. all the members are accessible in all other classes of the same package only, since they are trusted or friends. This is called Package level access. No any key word is used to specify default access.

```
package mypackage;
class abc
{ int p;
void method1()
{ p=10;
system.out.print("Package method");
}
}
class xyz
{…….
void method2()
{ abc x = new abc();
x.p =10;
x.method1() ;
}
}
```

16. What do you understand by Library in Java?

Ans: A library is readymade and reusable component/codes that can be used in a program to perform predefined task.

 Some commonly used Java libraries are Math Library, String Library, Utility Library and IO Library etc.

 You can use import statement at the top of the program to include the Java libraries.

import java.io.*;

 The java.lang is the default imported library in your program without writing import statement.

String Library & its commonly used methods

1 .boolen equals(str) - Compare this (current) string to given string and returns true if both are true otherwise false. e.g. boolean test=str1.equals(str2);

2. int compareTo(str1,str2) - Compare two strings in alphabetical order.

boolean equalsIgnoreCase(str) - Compare this string to given string but ignores case difference.

3. int length() -Returns the length of this string.

e.g. int x=str1.length();

Math Library & its commonly used methods

 Java provides math library, which available under java.lang package.

 In order to use functions/methods of math library, you need to invoke function using math keywords before the function.
e.g. x=math.abs(-7.5);
1. **pow(num1,num2)** - It computes num1 num2 , where num1 and num2 are numbers.
e.g. syste.out.print(“”+math.pow(2,3);
2. **round(num1)** - It rounds off a given number to its nearest integer. It can take float/double as argument.
e.g.
system.out.print(“”+math.round(1.5)); 2
system.out.print(“”+math.round(-1.5)); -1

Using Dates & Times in JAVA

 Java offers two classes in java.util package to manipulate date and time.
1. java.util.Date 2. java.util.Calendar
 In order to use Date & calendar, you need to import java.util package. E.g. import java.util.*;

Date d=new Date(); -It returns system date in the given format.
Tue Jul 20 17:30:22 GMT+05:30 2010

UNSOLVED QUESTIONS

1. What are the different types of access specifier supported by java?
2. Which is the default package of java?
3. What is friendly access of class member?
4. How does a class enforce information hiding?
5. Define an abstract class and abstract methods.
6. What is an interface? What is the use of Interface.

CHAPTER 7

CONCEPT OF INHERITANCE IN JAVA

Brief Summary of the Chapter:

This chapter talks about Inheritance, the capability of one class to derive properties from another class. Here we can learn how the inheritance is implemented in Java.

KEY POINTS

- **Inheritance:** Inheritance is the capability of one class to inherit properties from an existing class. Inheritance supports reusability of code and is able to simulate the transitive nature of real life objects.

- **Derived/Sub and Base/Super classes**

A class from which another class is inheriting its properties is called base class and the class inheriting properties is known as a sub class and derived class.

1. Single (1:1)

→ when a class inherits from a single base class.

2. Hierarchical (1:M)

→when several classes inherit from the same class.

3. Multilevel (1:1:1)

→When a subclass is the base class of another class.

- **Method Overriding**: If Base class has a method with same signature as in sub class the method of subclass overshadows the method of base class , it is called Method overriding.

- **Method Overloading:** Two methods with same name but different signatures are there in the same scope of program.

- **Abstract Class:** The class that is used as only base class, no object of this class is used in the program.

Solved Questions:

1. What is inheritance ?

   Ans: Inheritance is a form of software reusability in which new classes are created from existing classes by absorbing their attributes and behaviours.
2. What is the primary purpose of inheritance ?

   Ans: The primary purpose of inheritance is code reusability.
3. Name three basic concepts in Java which are used in Object oriented programming.

   Ans:The three basic concepts are Classes , Objects and inheritance.
4. Which constructor is called first: subclass or superclass ?

   Ans: A subclass constructor always calls the constructor for its superclass first explicitly or implicitly to create and initialize the subclass members.
5. What is abstract class?

   Ans:An Abstract class is the one that simply represents a concept and whose objects can't be created. It is created through the use of keyword abstract.

   The superclass set up as an abstract class does not allow objects of its prototype to be created. In this case only objects of the subclass are used.

6. What is method overriding in Java?

   Ans:A method in a subclass hides or overshadows a method inherited from the superclass if both methods have same signature.(i.e. the same name, number and type of arguments and the same return type.) This property is known as Overriding the Inherited method.
7. What is an Interface in Java?

   Ans: An Interface defines a protocol of behaviour or it is a collection of constants and abstract methods. These are not classes, but they can be used in the definition of a class.
8. What is the significance of abstract class in Java program?

   Ans: When a class defines a method using the same namem return type, and arguments as a method in its superclass, the method in the class overrides the method in the superclass.

   When the method is invoked for an object of the class, it is the new definition of the method that is called, and not the method definition from superclass. Methods may be overridden to be more public, not more private.

9. What types of inheritance does Java have?

   Ans: Java supports only these inheritance types:

   i. Single inheritance ii. Multilevel inheritance iii. Hierarchical
10. State True and False
    a. A subclass inherits both member variables and member methods of superclass.
    b. A class created with keyword abstract can have at the most one object.
    c. Overloading and Overriding are similar concepts in Java.
    d. Java supports single inheritance only at multiple levels of inheritance.
    e. Interfaces are used for multiple inheritance.

Ans: a. True b. False c. False d. True e. False

11. Declare and explain the basic syntax of inheritance.

Ans:The basic syntax for specifying an inherited class is as:

```
class child_class extends parent_class {
        // class contents
        }
```

The syntax represents the definition of the class child_class. The child_class automatically inherits an initial set of methods and variables from the parent class. The inherited variables and method can be used by the child class as if they had been declared locally in the child_class.

12. How does inheritance support software reuse?

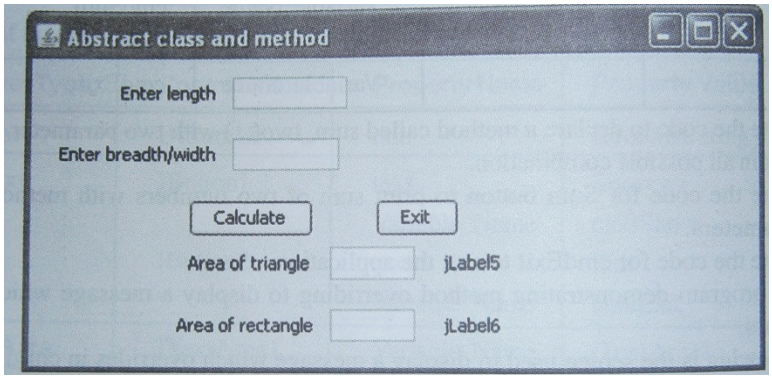
Ans:Because a new class can be derived from an existing one, the characteristics of the parent class can be reused without the erroneous process of copying and modifying code.

13. Differentiate between method overloading and method overriding.

Ans: Overloading: The methods with the same name but it differ by types of arguments and number of arguments.
Overriding: The methods with the same name and same number of arguments and types but one is in base class and second as in derived class. Derived class overrides over base class.

14. Write a program to find the area of triangle and rectangle through abstract class and abstract class method.

The following is the screen used to find the area of triangle and rectangle using abstract class and abstract class methods:



The list of controls for the above form is as follows:

Control Type	Control Name	Property Name	Property Value
JFrame	AbstractU1	title	Abstract class and method
JTextField	JTextFIeld1 JTextFIeld2 JTextFIeld3 JTextFIeld4	text Variable Name text Variable Name text Variable Name text Variable Name	[None] txtL [None] txtH [None] txtAreaT [None] txtAreaR
JButton	JButton1	text Variable Name text Variable Name	Calculate cmdCalc Exit cmdExit

a) Write the code to declare an abstract class Figure with an abstract method area( ). Notice that the class should declare the possible variables for area operation.

b) Write the code to declare two classes called Rectangle and Triangle which will calculate the area for both rectangle and triangle using the abstract method area( ). Use suitable constructors for both classes.

c) Write the code for Calculate button to access the abstract method for both triangle and rectangle.

d) Write the code for cmdExit to exit the application.

Ans:

a)
```
abstract class Figure {
        double L;
        double BH;
        Figure( double a, double b){
        L= a;
        BH = b;
        }
        Abstract double area( );
}
```

b)
```
class Rectangle extends Figure {
    Rectangle ( double a, double b){
    super( a, b );
    }
    double area( ) {
        jLabel5.setText(" Inside Area of Rectangle. ");
        return L* BH;
        }
    }
    Class Triangle extends Figure {
        Traingle ( double a, double b) {
            Super( a, b);
            }
            double area( ) {
            jLabel6.setText("Inside Area for Triangle.");
            return L * BH /2;
            }
        }
```

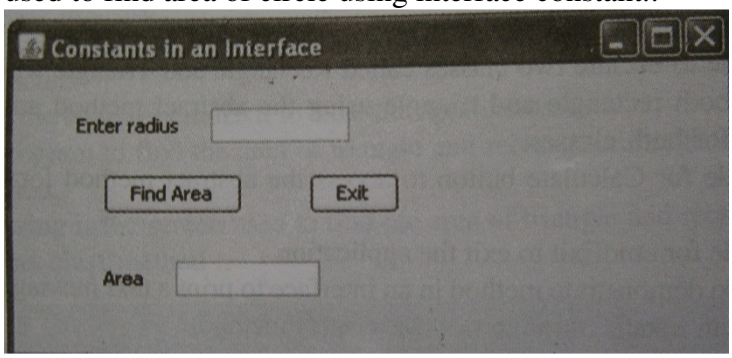
c)
```
int len, heigh;
len = Integre.parseInt(txtL.getText());
heigh= Integre.parseInt(txtH.getText());
Rectangle r = new Rectangle ( len, heigh);
Triangle t = new Triangle ( len, heigh);
Figure F;
F=r;
txtAreaR.setText(String.valueOf(F.area( )));
F= t;
txtAreaT.setText(String.valueOf(F.area( )));
```

d)
```
System.exit(0);
```

15. Write a program to demonstrate constant in an interface to find the area of circle. Notice that the interface should declare the value of pie as a constant. That is:

```
interface valuePie {
        double PIE= 3.14;
        }
```

Using class, implement the interface constant and find the area of circle. The following is the screen used to find area of circle using interface constant.:



The list of controls for the above form is as follows:

Control Type	Control Name	Property Name	Property Value
JFrame	IntAreaUi	Title	Constant in an Interface
JTextField	JTextField1 JTextField2	text Variable Name text Variable Name	[None] txtR [None] txtArea
JButton	JButton1	text Variable Name text Variable Name	Find Area cmdArea Exit cmdExit

a) Write the code to declare an interface for constant with implementation class method area().
b) Write the code for FindArea button to acecess the abstract method and display the area of circle in textbox.
c) Write the code for cmdExit to exit to exist the application.

Ans: a)

```
interface valuePie {
        double PIE=3.14;
        }
class cArea implements valuePie {
        public double area ( float r){
                return ( PIE *r*r);
                }
        }
```

b)

```
 float r = Float.parseFloat(txtR.getText( ) );
cArea C = new cArea ( );
txtArea.setText (String.valueOf (C.area( )));
```

c)

```
System.exit(0);
```

Unsolved Questions:

1. What members of a class out of private, protected and public are inheritable?
2. When do we declare a method or class 'final'?
3. What is an abstract class?
4. When do we declare a method or class abstract?
5. What is the difference between an abstract class and an interface?

CHAPTER 8

GUI DIALOGS AND TABLES

Brief Summary of the Chapter:

This chapter tells us about how we can create dialogs in Java Swing through NetBeans IDE.
KEY POINTS:

- **A Dialog**: It is a small separate window that appears to either provide or request to/from the user.
- Java Swing provides four dialog types: **a) JDialog**(General purpose dialogs) **b) JOptionPane** (Pre-defined styles) **c) JFileChooser** (dialog for choosing files) **and d) JColorChooser**(dialog for choosing colour)
- **JOptionPane dialog Type**:

There are four built-in dialog styles:

1) Message dialog→ **JOption.ShowMessageDialog()** displays the message dialog
2) Input dialog→ **JOption.ShowInputDialog()** displays the input dialog
3) Confirm dialog→ **JOption.ShowConfirmDialog()** displays the confirm dialog
4) Option dialog→ **JOption.ShowOptionDialog()** displays the option dialog

Solved Questions:

1. What is dialog in Java?
   Ans: A dialog is a small separate window that appears to either provide or request to / from the user.
2. Write the import statement required for using JOptionPane class.
   Ans:import javax.swing.JOptionPane;
3. What is showConfirmDialog ( ) method of JOptionPane class do ?
   Ans: This method displays a dialog with several buttons and returns as int option type corresponding to the button pressed (mostly one from Yes, No or Cancel)
4. What is showInputDialog ( ) method of JOptionPane class do ?
   Ans: This method displays a dialog which is intended to receive user input, and returns a String if the input component is a text field. It displays two buttons : OK and Cancel.
5. What is the difference between a dialog created with JDialog and a dialog created with JOptionPane?

Ans: The dialog created with JDialog can be customised in any form the user wants. Also with JDialog, a window's default cloasing behaviour is available with minimize, maximaize and close buttons.

A dialog created with JOptionPane can be one of the four pre-defined styles. Also, it only offers a close button for window closing.

Unsolved Questions:

1. What are the various type of dialog options supported by JOptionPane?
2. Name four methods associated with JOption dialog.
3. Explain the various possible value for Option type property of JOptionPane dialog.

CHAPTER 9

JAVA DATABASE CONNECTIVITY TO MYSQL

Brief Summary of the Chapter:

In this chapter we shall know how to connect the front end NetBeans application with back-end databases through JDBC,ODBC for making GUI applications.

KEY POINTS:

- **Classes used for Database Connectivity**
  - Driver Manager Class,
  - Connection Class,
  - Statement Class,
  - ResultSet Class
- **Prerequisites for connecting to MySQL from Java**

MySQL provides connectivity for client applications developed in the Java Programming language via a JDBC driver known as MySQL Connector/J

- **Connection:**

A connection is the session between the application program and the database. To do anything with database, one must have a connection object.

- **Connecting to MySQL from Java :**

Steps for Creating Database Connectivity Application
There are mainly six steps –
Step-1 Import the Packages Required for Database Programming.
Step-2 Register the JDBC Driver
Step-3 Open a Connection
Step-4 Execute a Query
Step-5 Extract Data from Result set
Step-6 Clean up the Environment
Now to connect to a database, you need to know database's complete URL, the user's Id and password-
Jdbc:mysql://localhost/<database-name>?user="username" & password="password"

- **ResultSet Methods**

A result set (represented by a ResultSet object) refers to a logical set records that are fetched from the database by executing a query and made available to the application –program. There are various resultSet methods such as:-

- next( ) :moves the cursor forward on row.
- first( ) :moves the cursor to the first row in the ResultSet Object.
- Last( ) :moves the cursor to the last row in the ResultSet object.
- relative(in rows) :moves the cursor relative to its current position.
- Absolute(int rno) :positions the cursor on the rno-th row of the ResultSet object.
- getRow( ) :Retrieves the current row number the cursor is pointing at.

That is if cursor is at first row the getRow( ) will return 1.

SOLVED QUESTIONS:

1. What is the importance of java.sql.*; in java jdbc connection ?

   Ans: The java.sql.package has to be imported first before we can create a java jdbc connection to the database.

6. What is DriverManager ?

   Ans: DriverManager a class of java.sql package that controls a set of JDBC drivers. Each driver has to be registere with this class.

7. What is the purpose of connection.close() method?

   Ans: This method is used for disconnecting the connection. It frees all the resources occupied by the database.

8. Name the four components of JDBC.

   Ans:JDBC consisits of four components: The JDBC API, JDBC Driver Manager, The JDBC Test Suite and JDBC-ODBC Bridge.

9. What are the steps involved in establishing a connection?

   Ans:To establishing a connection we need to follow two steps: a) loading the driver and b) making a connection.

10. What is ResultSet ?

    Ans:A result set (represented by a ResultSet object) refers to a logical set of records that are fetched from the database by executing a query and made available to the application program.

11. What type of parameter that used in executeQuery( ) method?

    Ans: The executeQuery( ) method has a single String parameter. This parameter must be valid SQL command.

12. What is Connection? What is its role?

    Ans: A Connection (represented through Connection object) is the session between the application program and the database. To do anything with database, one must have a connection object.

13. What all JDBC classes/objects are used in a database connectivity application?

    Ans: a) DriverManager Class b) Connection Object c)Statement Object d) ResultSet Object

14. What is JDBC? What is its basic functionality?

    Ans: The JDBC(Java Database Connectivity) API defines interfaces and classes for writing database applications in Java by making database connections. Using JDBC we can send SQL, PL/SQL statements to almost any relational database. JDBC is a Java API for executing SQL statements and supports basic SQL functionality. It provides RDBMS access by allowing us to embed SQL inside Java code. Because Java can run on a thin client, applets embedded in Web pages can contain downloadable JDBC code to enable remote database access.

15. What is the JDBC-ODBC Bridge?

Ans: The JDBC-ODBC Bridge is a JDBC driver which implements JDBC operations by translating them into ODBC operations. To ODBC it appears as a normal application program. The Bridge implements JDBC for any database for which as ODBC driver is available. The Bridge is implemented as the sun.jdbc.odbc Java package and contains a native library used to access ODBC.

16. Explain the purpose of DriverManager.

Ans:The DriverManager looks after the managing the drivers for a JDBC application. When it is instantiated it makes an attempt to load the driver classes. When the method getConnection( ) is invoked, the driver manager attempts to locate the suitable driver. The DriverManager obtains the information about the drivers such as registering, locating, finding the drivers loaded, setting the time to wait when it tries to get the connection to a database.

17. Name the methods which are useful for executing SQL statements.

Ans: There are two methods which are responsible for executing SQL statements. These are:

- **executeQuery( )- For SQL statements that produce a single result set (like simple SQL query).**
- **executeUpdate( )- For executing INSERT,UPDATE OR DELETE statements and also SQL DDL(Data Definition Language) statements.**

Unsolved Questions:

1. Differentiate between JDBC and ODBC ?

2. What are the main tasks of JDBC ?

3. What are the various steps involved in establishing a JDBC connection?

4. Name the method used to trigger an update query using JDBC.

CHAPTER 10
WEB APPLICATION DEVELOPMENT

Brief Summary of the Chapter:

World Wide Web is an example of an information protocol/service that can be used to send and receive information over the internet. It supports:

- Multimedia Information (Text, Movies, Pictures, Sound, Programs etc…)
- Hyper Text Information :(Information that contains links to other information resources)
- Graphical User Interface :(So users can point and click to request information instead of typing in text commands)

The World Wide Web is an example of an information protocol/service that works using a Client/Server software design. A service that uses Client/Server design requires two pieces of software to work: Client software (e.g. Web Browser) to request information, and Server software(Web server) to answer requests and provide their information. Most Web applications are designed this way.

Key Points of the Chapter:

Uniform Resource Locator: The uniform resource locator (URL) is the unique identifier of a web page. The address or URL of the current page you are on appears in the "Address Bar" of the web browser.

What is Web Server: Web server delivers (serves) content, such as web pages, using the Hypertext Transfer Protocol (HTTP), over the World Wide Web.

What is Web Browser: A web browser is a client that initiates communication by making a request for a specific resource. The server then responds with the content of that resource, or an error message if unable to do provide the contents due to any reason.
Client Server Computing: It refers to a network set-up in which programs and information reside on the server and clients connect to the server for network access.
Dynamic Web Page: A dynamic document is created by web server whenever a browser requests the documents.
Static Web Page: A static document is a fixed content document that is created by web server whenever a browser requests the documents.

Solved Questions:

1. Identify the web browser software from the following options:
   (a) Apache Web Server (b) MS Word (c) HTML (d) Mozilla Firefox

   Ans. (d) Mozilla Firefox

2. A_____ document is created by web server whenever a browser requests the documents.
   (a) active (b) static (c) dynamic (d) none of the above

   Ans. (c) Dynamic

3. A_____ document is a fixed content document that is created by web server whenever a browser requests the documents.
   (a) active (b) static (c) dynamic (d) none of the above

   Ans. (b) Static

4. Identify the web server software from the following options:
   (a) Apache (b) MS Word (c) HTML (d) Mozilla Firefox

   Ans. (a) Apache

5. The address of a resource on the net is known as:
   (a) ISP (b) HTTP (c) URL (d) WWW

   Ans. (c) URL

6. A program that serves requested HTML files and pages.
   (a) Web Address (b) Web Page (c) Web Server (d) None of these

   Ans. (c) Web Server

7. **What is Uniform Resource Locator?**
   Ans: The uniform resource locator (URL) is the unique identifier of a web page. The address or URL of the current page you are on appears in the "Address Bar" of the web browser. You can go directly to a web page if you know its URL by simply typing the URL in the address bar. You can click in the address bar at any time and overwrite the current address with another URL to jump to a different web page.The most general form of a URL syntax is as follows:

   Protocol://domain name/<directory path>/<object name>
   For example:
   http://www.openoffice.org/dev_docs/features/3.2/rc2.html

8. **What is Web Server?**
   Ans: Web server delivers (serves) content, such as web pages, using the Hypertext Transfer Protocol (HTTP), over the World Wide Web.

9. **What is Web Browser?**
   Ans: A web browser is a client that initiates communication by making a request for a specific resource. The server then responds with the content of that resource, or an error message if unable to do provide the contents due to any reason.

Unsolved Questions:

1. In the URL, *http://www.mycorp.com/pr/master.htm,* what is the http component?
2. In the URL, *http://www.mycorp.com/pr/master.htm,* what is the www.mycorp.com component?
3. In the URL, *http://www.mycorp.com/pr/master.htm*, what is the /pr/master.htm component?
4. What do you mean by Web Browser, and Web Server?
5. Which protocol is used to upload/ transfer the file from host to server Internet?
6. What is WWW? How does it function?
7. A web browser & web server are an application of client/server computing concept. Comment on this statement?
8. What is URL ? What are its components?
9. What is CGI? How it works in Dynamic web Page service?
10. Differentiate between Static and Dynamic Web Service?

CHAPTER 11
HTML-I : BASIC HTML ELEMENTS

Brief Summary of the Chapter:

The World Wide Web (or simply the Web or WWW) is a system of sharing interlinked hypertext documents over the internet. These documents are stored on web-servers on the internet and contain text, images, videos and other multimedia. These documents also contain hyperlinks to navigate among them. HTML (Hyper Text Markup Language) is the basic language which is used to create Hypertext documents. In this lesson we are going to learn how to create hyper text documents using HTML.

Key Points of the Chapter:

- HTML stands for Hyper Mark-up Language.
- HTML is the subset of SGML (Standard Generalised Markup Language)
- The head of the HTML document is where you enter the title of the page.
- Headings are typically displayed in larger and/or bolder fonts than normal body text. HTML has six levels of heading, numbered 1 to 6, with 1 being the largest.
- The BACKGROUND is the image attribute in <BODY> tag where you can place graphic object to make more attractive Web page.
- The BGCOLOR attribute is used to set the background color of your Web page with <BODY> tag.

Solved Questions:

1. HTML tags must be written within:
   (a) < > (b) { } (c) [ ] (d) ( )
   Ans: (a) <>

2. Which of the following is the correct structure of HTML tags?
   (a) < HTML> </HTML> <HEAD> </HEAD> <BODY> </BODY>
   (b) <HTML> <HEAD> </HEAD> </HTML> <BODY> </BODY>
   (c) <HTML> <HEAD> <BODY> </BODY> </HEAD> </HTML>
   (d) <HTML> <HEAD> </HEAD> <BODY> </BODY> </HTML>
   Ans: (d) <HTML> <HEAD> </HEAD> <BODY> </BODY> </HTML>

3. What is HTML?
   Ans: HTML stands for Hyper Text Markup Language. It is a markup language used to create HTML documents. An HTML document defines a web page.

4. Define <html> tag
   Ans: The <html> tag identifies the document. An HTML document begin with <html> ends with </html>.

5. **Give two differences between HTML and XML.**
   Ans: The three differences between HTML and XML are:
   1. HTML is designed to display data and hence, focussed on the 'look' of the data, whereas XML is designed to describe and **carry data and hence, focuses on 'what data is'.**
   2. In HTML tags are predefined, while in XML, tags can be created as per needs.
   3. HTML tags are not case sensitive, whereas XML tags are case sensitive

Unsolved Questions:

1. What do you need to do work with HTML?
2. Write as HTML code line to set the background image as CLOUDS.GIF.
3. Write an HTML code line to set the BGCOLOR as YELLOW.
4. Write the HTML codes to set the BGCOLOR as PURPLE and a text "I am in Class X-A" as BLUE.
5. Write the HTML codes to set the BGCOLOR as LIME, header 1 <H1> text "Text Example with size and color" as BLUE, text font size as 30 and color="RED".
6. Write the HTML codes to set the BGCOLOR as NAVY, header 1 <H1> text "Text Example with size color, and font face" as WHITE, text font size as 20, color "RED" and font face "ARIAL".
7. What is the method of using comment line in HTML code?
8. What is the use of <FONT> tag in HTML code? Write any two options used with this tag.
9. Which tag is used to insert heading of third level on a web page?
10. How would you display in the title bar of browser?
11. How
 tag is different from <P> tag?
12. What is the purpose of using the tag <H1>…<H6>?
13. How can the font size of a single line on a web page be changed?

14. What will be displayed on the web page for the following web page?

    <I Atomic weight of> /I> O <sub> 2

15. What is the use of <BODY> tag in HTML code? Write any two attributes used with this tag.
16. Which tag do we use to change the size and style (face) of the text of an HTML file viewed on a web browser? Also explain any two attributes used with this tag.
17. Distinguish between <SUP> and <SUB> tags with example.

CHAPTER 12
HTML-II : LISTS, TABLES AND FORMS

Brief Summary of the Chapter:

Making information more accessible is the single most important quality of HTML. The language's excellent collection of text style, formatting tools, and links tools help you organize your information into documents that readers quickly understand, scan, and extract.

Beyond embellishing your text width specialized text a tag, HTML also provides a rich set of tools that help you organize content into formatted lists. Apart from lists, you can insert images into your documents to enhance its visual approach. Also many documents can be linked together using HTML's sophisticated linking tools.

Also, there are situations where you need to represent tabular data(data in rows and columns). For this, HML provides Table tags.

Key Points of the Chapter:

- The numbered/ordered list <OL> tag is used to indicate a list item as contained in an ordered or numbered form.
- An ordered list is also a list of items. The list items are marked with numbers.
- Bulleted/unordered list <UL> tag is used to indicate a list item as contained in an unordered or bulleted form.
- LI list tag is used to denote the beginning of each new list item.
- The TYPE attribute is used to change the bulleted symbol in a list. The attribute may have a value of circle, disc, or square. For example, <UL TYPE=disk>.
- The list items are marked with bullets (typically small black circles).
- The START attribute is used to change the beginning value of an ordered list. Normally, the ordered list starts with 1. For example, <OL START = 10>.
- The IMG SCR tag specifies an image to be displayed in a Web page. This is an empty element, which is coded in HTML document. It has attributes like : SRC, ALIGN, BORDER, HEIGHT, WIDTH and ALT.
- A table is divided into rows (with the <tr> tag), and each row is divided into data cells (with the <td> tag).\ The letters td stands for "table data", which is the content of a data cell.
- Links between Web pages is known as hyperlink.
- The anchor tag <A> marks the text as hypertext link.
- The HREF attribute specifies the destination of a link.
- The HREF or the name attribute must be present in the <A> tag.
- A URL, basically, is a way to tell your web browser (or other program) where to look for something. If you want to make a hypertext link to a page. You will need its URL.
- HREF is an attribute for the <A> tag, which is displayed in a browser, the work Text describing link would appear underlined and in another order to indicate that clicking that text initiates the hypertext link.

Solved Questions:

1. What is an unordered list?

Ans: Bulleted/unordered list <UL> tag is used to indicate a list item as contained in an unordered or bulleted form.

2. What is ordered list?

Ans: The numbered/ordered list <OL> tag is used to indicate a list item as contained in an ordered or numbered form.

3. What is table? What are the basic commands for creating a table?

Ans: Table is a collection of rows and column.
Followings are important tags
<Table> :- used to give identification to a table
<TH> :- To provide headings in a table
<TR>:- (Table Row) to create Row in a table
<TD> :- (Table Data) to create columns in a row

4. What do you understand by ALINK? Explain with an example.

Ans: Links which are currently being visited in web page are known as Active Links (ALINK).
Example:
<BODY TEXT = "#FFFFFF" ALINK="#FF0000">
<A HREF="www.kvsangathan.nic.in"> Kendriya Vidyalaya Sangathan </A>
<A HREF = www.cbse.nic.in> Central Board of Secondary Education </A>
</BODY>

5. What is FORM tag? Explain with example.

Ans: To create or use forms in a web page <FORM> tag is used. Form is means to collect data from the site visitor. It is done with the help of controls that collect data and send it over.
Example:
<FORM method = "POST" action=submitform.asp>

6. What is INPUT tag? Explain with example.

Ans: Text boxes are single line text input controls that are created using <INPUT> tag whose TYPE attribute has a value as "Text".
Example:
<FORM method = "POST" action=submitform.asp>
First Name:

<INPUT TYPE="text" NAME = "fname"/>

Last Name:
<INPUT TYPE="text" NAME = "lname" />
</FORM>

7. What is the purpose of select tag?

Ans: <SELECT> tag is used to create a drop down box in which many options are available; user can make selection from the list.
Example:
<SELECT name = "stream">
<OPTION value="Science"> Science</OPTION>
<OPTION value="Commerce"> Commerce </OPTION>
<option value="Humanities"> Humanities </OPTION>
</SELECT>

Unsolved Questions:

1. What types of list are supported by HTML?
2. Which three tags let you create the definition list?
3. Which three tags let you create the (i) un numbered lists? (ii) numbered lists?
4. What is a table? Which tag is used to create tables in HTML?
5. Which attributes are used to give border to a table?
6. Which attribute lets you control the display of select border sides of a table?
7. Which attributes is used to control the inside table border?
8. How is spacing in cells of table controlled?
9. What is the role of ALIGN attribute of <TABLE> tag?
10. How can you specify following in table?

(a) background image (b) background colour.
(c) Table height. (d) Table width.

11. What tag is used to specify
(i) Table data (ii) Table header (iii) Table row?
12. Name the attributes used for following?
(i) Setting the cell width. (iii) Setting cells background colour.
(ii) Changing the cell span. (iv) Aligning cell contents vertically.
13. What for are <TH> and <TR> tags used?
14. What are forms? Which methods and actions are commonly used with Forms?
15. Name different control types supported by HTML forms.
16. Write the tags to define the following :
(i) A text box (ii) A text area (iii) A radio button
(iv) A check box (v) A Password box (vi) A Pop up box
(vii) Submit button (viii) A label.
17. How will you nest an un order list inside an ordered list?
18. How would you indent a single word and put a square bullet in front of it?
19. Write code to produce following HTML tables?

1	3 4
2	5

21. Write HTML code to produce these controls
(i) a text box (ii) a text area with 10 rows and 30 columns
(iii) A password text box (iv) A pop up box to choose class from it.

CHAPTER 13

eXentensible Markup Language

Brief Summary of the Chapter:

It is a markup language. Markup language is a set of rules that defines the structure and format of text while presenting text. XML stands for e**X**tensible **M**arkup **L**anguage. XML is designed to transport, store and describe data. Whereas HTML was designed to display data. XML tags are not predefined. We must define your own tags in XML. An XML document that follows all grammar rules is well-formed document.

KEY POINTS OF THE CHAPTER

- A markup language is a set of rules that defines the structure and format of text while presenting text.
- XML is a markup language.
- A meta-language is a language that is used to define other languages.
- XML is based on SGML.SGML was the first markup language.
- XML is different from HTML as it does not display the data but describes and carries it.
- XML is free and extensible.
- XML is platform independent.
- The XML document that obeys XML grammar rule is called well-formed document.
- DTD (Document definition type) is a set of rules that defines what tags appear in an XML document.

- CSS (Cascading Style Sheet) are a collection of forming rules that control the appearance of content in a webpage.

SOLVED QUESTIONS

1. **XML expand to_____**
   Ans. - eXtensible Markup Language
2. **An XML document has a logical structure and a _____ structure**.
   Ans. -Physical
3. **First generic markup language is**
   Ans-SGML
4. **CSS means**
   (a) Colored system software (b) combined style sheet
   (c) Colored style sheet (d) cascading style sheet
   Ans.–(d)
5. **XML is case sensitive(T/F)**
   Ans. -T
6. **Define DTD?**
   Ans. -DTD is a set of rules that defines what tags appear in an XML document.
7. **To link an XML document with a stylesheet**
   (a) Create XML document (b) create a separate CSS stylesheet for XML file
   (c) Link the two files (d) All of the above
   Ans. -All of the above
8. **Two important software that validates or process XML documents are**
   (a) XML validator (b) XML Parser (c) both (a) and (b) (d) None of these
   Ans.-(c)
9. **I enclose all other elements of an XML document. Who am I?**
   (a) Processing Instruction (b) Parsed data (c) Root data (d) Attribute
   Ans. - Root data
10. **XML documents can be viewed as web page properly if proper stylesheet file is also available along with XML file.(T/F)**
    Ans.-T
11. **The XML file confirming to syntax rules or grammar rules is called**
    (a) Correct document (b) valid document
    (c) Well-formed document (d) confirmed document
    Ans. - well-formed document
12. **What is markup language?**
    Ans.-A markup language is a set of rules/tags that defines the structure and format of text while presenting text.
13. **What is XML?**
    Ans. - XML is eXtensible Markup Language which allows creating application specific structured document by allowing creation of new tags. These structured documents can later be presented in human-understandable manner in different ways.
14. **Expand the following terms**
    (i) XML (ii) EDI (iii) CSS (iv) DTD

    Ans.-(i) XML-extensible Markup Language
    (ii) EDI-Electronic Data Interchange
    (iii) CSS- Cascading Style Sheet
    (iv) DTD- Document Type Definition

15. Compare HTML and XML briefly

Ans. - HTML versus XML

	HTML	**XML**
1	HTML document formats and displays	XML documents carry data along with their
2	HTML tags are predefined	New tags can be created as per our
3	HTML may not have closing tags.	XML must have closing tags.
4	HTML tags are not case sensitive	XML tags are case sensitive.
5	HTML documents are directly viewable in a browser.	XML documents are viewed only if proper style sheet file is also available along with

16. Describe features of XML

Ans. - Features of XML:

1. XML is designed to carry data not to display data.
2. XML was created to structure, store and to send information.
3. XML is self-descriptive. Tags are not pre-defined; rather they are created to describe the content in appropriate manner.
4. XML is free and extensible.
5. XML is platform independent.
6. XML can separate Data from HTML. XML stores and describes data, which can later be formatted and presented in desired way.
7. XML can be used to create new languages, since it is a Meta language.
8. XML is supported and recommended by World Wide Web Consortium (W3C).

CHAPTER 14

MYSQL REVISION TOUR

Brief Summary of the Chapter:

A database system is basically a computer based record keeping system. There are different data models are available. The most popular data model is Relational Data Model (RDBMS). In RDBMS data is arranged in the form of table. MYSQL is software to manipulate database. It is free, open-source RDBMS. In order to access data within MYSQL database, all programs and users must use, Structured Query Language (SQL).SQL is the set of commands that is recognized by nearly all RDBMs. SQL commands can be classified into three categories. These are DDL (Data Definition Language), DML (Data Manipulations Language) and TCL (Transmission Control Language). Apart from MYSQL is commands, it has various functions that performs some operation and returns a single

value. In this chapter we will learn various commands and functions in MYSQL and its implementation.

KEY POINTS OF THE CHAPTER

- **Structure Query Language**
  A non-procedural UGL used for querying upon relational database
- **DDL: Data Definition Language**
  Part of the SQL that facilitates defining creation/modification etc. of database object such as tables, indexes, sequences etc.
- **DML: Data Manipulation Language**.
  Part of the SQL that facilitates manipulation (additions/deletions/modification) of data which residing in the database tables.
- **Meta Data**
  Facts/data about the data stored in table.
- **Data Dictionary**
  A file containing facts/data about the data stored in table
- **Relational Data Model**
  In this model data is organized into tables i.e. rows and columns. These tables are called relations.
- **The Network Data Model**
  In this model data are represented by collection of records & relationships among data. The collections of records are connected to one another by means of links.
- **The Hierarchical Data Model**
  In this model records are organized as trees rather than arbitrary graphs.
- **Object Oriented Data Model**
  Data and associated operations are represented by objects. An object is an identifiable entity with some characteristics and behavior.
- **Relation:**
  Table in Database

- **Domain:**
  Pool of values from which the actual values appearing
- **Tuple:**
  A row of a relation
- **Attribute:**
  A column of relation
- **Degree:**
  Number of attributes
- **Cardinality:**
  Number of tuples
- **View:**
  Virtual table that does not really exist in its own right
- **Primary Key:**
  Set of one or more attributes that can uniquely identify tuples with in the relation.
- **Candidate Key:**
  A Candidate Key is the one that is capable of becoming Primary key i.e., a field or attribute that has unique value for each row in the relation.
- **Alternate Key:**
  A candidate key that is not primary key is called alternate key.
- **Foreign Key:**
  A non-key attribute, whose values are derived from the primary key of some other table.
- **Integrity Constraints**
  Integrity Constraints are the rules that a database must comply all the times. It determines what all changes are permissible to a database.

- **Accessing Database in MySql :**

Through USE keyword we can start any database
Syntax:
USE <database Name>;
Example: USE STUDENT;

- **CREATING TABLE IN MYSQL**
  Through Create table command we can define any table.
  CREATE TABLE <tablename>
  (<columnname> <datatype>[(<Size>)],……..);
  CREATE TABLE Student(SRollNo integer, Sname char(20));

- **INSERTING DATA INTO TABLE**
  The rows are added to relations using INSERT command.
  INSERT INTO <tablename>[<columnname>]
  VALUES (<value>, <value>…);
  INSERT INTO student (Sid, Sname)
  VALUES (100,'ABC');

- **SELECT COMMAND:**
  It lets us make queries on the database.
  SELECT * FROM tablename WHERE condition;
  SELECT * FROM student WHERE Sid=100;

- **Eliminating Redundant Data**
  DISTINCT keyword eliminates redundant data
  SELECT DISTINCT Sid FROM Student;

- **Selecting from all the rows-ALL Keyword**
  SELECt ALL Sid FROM Student;

- **Viewing structure of table:**
  DESCRIBE/DESC <tablename>;
  DESCRIBE student;
  Using column aliases:
  SELECT <column name> AS [columnalias][,…]
  FROM <tablename>;
  SELECT rollno, name AS "studentname"
  FROM student;

- **Condition based on a range:**
  Keyword BETWEEN used for making range checks in queries.
  SELECT rollno, name FROM student WHERE rollno BETWEEN 10 AND 20;
- **Condition based on a list:**
  Keyword IN used for selecting values from a list of values.
  SELECT rollno, name FROM student WHERE rollno IN (10, 20, 60);
- **Condition based on a pattern matches:**
  Keyword LIKE used for making character comparison using strings
  percent(%) matches any substring
  underscore(_) matches any character
  SELECT rollno, name FROM student WHERE name LIKE '%ri';
- **ORDER BY clause:**
  It is used to sort the results of a query.
  SELECT <column name> [, <column name>, …]
  FROM <table name>
  [WHERE <condition>]

[ORDER BY <column name>];
SELECT *
FROM student
WHERE marks>50
ORDER BY name;

- **MySQL functions:**
  A function is a special type of predefined command set that performs some operation and returns a single value.
  String functions :(Lower / LCASE( ), Upper/UCASE( ), Concate( ), Instr( ), Length( ), RTrim( ), LTrim( ), Substr( ))
  Numeric function :(Round( ), Truncate( ), Mod( ), Sign( ))
  3.Date functions:(Curdate( ), Date( ), Month( ), year( ), DayName( ), DayofMonth( ), DayofWeek( ), DayofYear( ), Now( ), SysDate( ))

- **Creating tables with SQL Constraint :**
  CREATE TABLE command is used to CREATE tables
  CREATE TABLE tablename
  (columnname datatype size, …);

- **SQL Constraint:**
  A Constraint is a condition or check applicable on a field or set of fields.
- **NOT NULL/UNIQUE/DEFAULT/CHECK/PRIMARY KEY/FOREIGN KEY Constraint:**

  CREATE TABLE student (Srollno integer NOT NULL, …);

  CREATE TABLE student (Srollno integer UNIQUE …);

  CREATE TABLE student (Srollno integer NOT NULL, Sclass integer, Sname varchar(30), Sclass DEFAULT 12);

  CREATE TABLE student (Srollno integer CHECK (Srollno>0), Sclass integer, Sname varchar(30));

  CREATE TABLE student (Srollno integer NOT NULL PRIMARY KEY, Sclass integer, Sname varchar(30));

  CREATE TABLE teacher (Tid integer NOT NULL, FOREIGN KEY (Studentid) REFRENCES student (Sid));

- **Inserting data into table:**
  INSERT INTO command is used to insert data into table

  INSERT INTO tablename VALUES (value1,….);

  INSERT INTO student VALUES (1,'Ram', 12);

- **Modifying data in tables:**
  Existing data in tables can be changed with UPDATE command.

  UPDATE student SET Sclass=11 WHERE Sname='Ram';

- **Deleting data from tables:**
  Tuples in a table can be deleted using DELETE command.

DELETE FROM student WHERE Srollno>10;

SOLVED QUESTIONS

1. **What do you mean by a Database Management System?**

   Ans- Database Management is a collection of programs and files that allow a user to define structure of a database, store data into it, modify the structure and manipulate the data.

2. **What do you mean by Relational database?**

   Ans-Relational Database is a type of database in which relation is used as its basic element.Row and columns are used to store data.

3. **What is a foreign key?**

   Ans If a key is available in a table as a primary key then this key is called foreign key in another table.

4. **What is primary key?**

   Ans-Primary key is a unique key in a relation which can uniquely identifies a tuple (row) in a given relation.

5. **What is SQL?**

   Ans-SQL is stands for structured query language. This language is used to manipulate data stored in a table.

6. **What is referential integrity?**

   Ans-This is a rule which ensures that in DBMS relationships between records in related tables are valid. And that user don't accidently delete or change related data.

7. **What is MySql?**

   Ans-Mysql is an open source RDBMS which uses SQL.

8. **What is DDL?**

   Ans- DDL provides commands to define or redefine the schema of a table.Table is created,altered and dropped using DDL.

9. **What are DML commands?**

   Ans- DML commands are used to manipulate data stored in a table.Insertion, deletion and modifications are possible using DML commands.

10. **Maximum how many characters can be stored in a (i) text literals (ii) numeric literal**

    Ans-(i) Text literals can have 4000 bytes (ii) A numeric literals can store 53 digits.

11. **What is null value in MySql?**

    Ans-If a column in a row has no value, then column is said to be null.

12. **Which keyword eliminates redundant data in from a query result?**

    Ans- DISTINCT

13. **How would you display system date as the result of a query?**

Ans- CURDATE()

14. What is NOW() function in MySql?

Ans- It returns the current date and time.

15. What is NOT NULL constraint?

Ans- NOT NULL constraints impose a condition that value of a row cannot be left blank.

16. What is error in following statement?

UPDATE EMPL;

Ans- WHERE clause is missing in given query.

17. Identify the error?

DELETE ALL FROM TABLE EMP;

Ans-There is no need to write ALL and TABLE word in above query.

Correct form is-DELETE FROM EMP;

18. Differeniate WHERE and HAVING clause?

Ans-:- Where clause is used to select particular rows that satisfy condition whereas having clause is used in connection with aggregate function, group by clause.

19. How SQL commands are are classified?

Ans-SQL Commands are classified into three categories

(i)Data Definition Language (DDL)-Commands that allow us to perform tasks related to data definition. E.g. creating, altering and dropping

(ii) Data Manipulation Language (DML) - Commands that allows us to perform data manipulation e.g retrieval, insertion, and modification of data stored in a database.

(iii) Transaction Control Language (TCL)-Commands that allow us to manage and control the transactions.

20. What is difference between char and varchar?

Ans-The difference between char and varchar is that of fixed length and variable length.The CHAR datatypes specifies a fixed length character string.When a column is given datatype as CHAR(n) then MySQL ensures that all values stored in that column have this length.But on other hand when a column is given datatype as VARCHAR(n) ,then the maximum size of a value in this column stores exactly what we specify.

21. What do you understand by the terms primary key and degree of a relation in relational data base?

Ans: Primary Key: A primary key is a set of one or more attributes that can uniquely identify tuples within the relations. The number of attributes in a relation is called Degree of arelation in relational data base.

22. What do you understand by the candidate key and cardinality of a relation in relational data base?

Candidate Key: All attribute combinations inside a relation that can serve as primary key(uniquely identifies a row in a relation) are Candidate Keys as they are candidates for the primary key position. The number of rows in a relation is known as cardinality of a relation.

23. Consider the following tables Item and Customer. Write SQL commands for the statement (i) to (iv) and give outputs for SQL queries (v) to (viii)

Table: **ITEM**

S.no	**I_ID**	**Item Name**	**Manufacturer Price**
01	PC01	Personal Computer	ABC 35000
02	LC05	Laptop	ABC 55000
03	PC03	Personal Computer	XYZ 32000
04	PC06	Personal Computer	COMP 37000
05	LC03	Laptop	PQR 57000

Table: CUSTOMER C_ID Customer Name City I_ID

S.no	**CUSTOMER C_ID**	**Customer Name**	**City**	**I_ID**
01	**01**	**N.Roy**	Delhi	LC03
02	**06**	**H.Singh**	Mumbai	PC03
03	**12**	**R.Pandey**	Delhi	PC06
04	**15**	**C.Sharma**	Delhi	LC03
05	**16**	**K.Agrawal**	Bangalore	PC01

(i) To display the details of those Customers whose city is Delhi
.**Ans:** Select all from Customer Where City=”Delhi”
(ii)To display the details of Item whose Price is in the range of 35000 to 55000 (Both values included).
Ans: Select all from Item Where Price>=35000 and Price <=55000
(iii)To display the Customer Name, City from table Customer, and Item Name and Price from table Item, with their correspondingmatching I_ID.
Ans: Select Customer Name, City, ItemName, Price from Item, Customer where Item.I_ID=Customer.I_ID.
(iv) To increase the Price of all Items by 1000 in the table Item.
Ans: Update Item set Price=Price+1000
(v)SELECT DISTINCT City FROM Customer.
Ans: City Delhi, Mumbai, Bangalore
(vi)SELECT Item Name, MAX(Price), Count(*) FROM Item GROUP BY Item Name;
Ans: **Item Name Max(Price) Count(*)** Personal Computer 37000 3 Laptop 57000 2
(vii)SELECT Customer Name, Manufacturer FROM Item, Customer WHERE Item.Item_Id=Customer.Item_Id;
Ans: Customer Name Manufacturer Name
N.Roy PQR
H.Singh XYZ
R.Pandey COMP
C.Sharma PQR
K.Agarwal ABC
(viii)SELECT Item Name, Price * 100 FROM Item WHERE Manufacturer = ‘ABC’;

Ans: Item Name Price*100 Personal Computer 3500000
Laptop 5500000

UNSOLVED QUESTIONS

1. Write MySql command that will be used to show all the databases which is already created in MySql.
2. The Department column and date of joining of a table Employee is given below:

Department	Date_of_Joining
Biology	2009-07-19
Zoology	2007-02-13
Bio_Tech	2010-05-15
Psycology	2011-09-06

(i) Based on the above table write SQL Query to display the name of those departments whose name ends with logy?

(ii) Based on the above table write SQL Query to display the name of those departments whose name starts with Bi.

3. What is the degree and cardinality of the above given Employee table?
4. Differentiate between Primary key and Unique Key?
5. Consider the following tables WORKERS and DESIG. Write SQL commands for the statements (i) to (iv) and give outputs for SQL queries (v) to (viii).

WORKERS

W_ID	FIRSTNAME	LASTNAME	ADDRESS CITY
102	**Sam**	**Tones**	33 Elm St. Paris
105	Sarah	Ackerman	44 U.S.110 New York
144	Manila	Sengupta	24 Friends Street New Delhi
210	George	Smith	83 First Street Howard
255	Mary	Jones	842 Vine Ave. Losantiville
300	Robert	Samuel	9 Fifth Cross Washington
335	Henry	Williams	12 Moore Street Boston
403	Ronny	Lee	121 Harrison St. Newyork
451	Pat	Thompson	11 Red Road Pari

DESIG

W_ID	SALARY	BENEFITS	DESIGINATION
102	**75000**	**15000**	Manager
105	**85000**	**25000**	Director
144	**70000**	**15000**	Manager
210	**75000**	**12500**	Manager
255	**50000**	**12000**	Clerk
300	**45000**	**10000**	Clerk
335	**40000**	**10000**	Clerk
400	**32000**	**7500**	Salesman
451	**28000**	**7500**	Salesman

(i) To display W_ID First name, address and City of all employees living in New York from the Table Workers

(ii) To display the content of workers table in ascending order of LASTNAME.

(iii) To display the FIRSTNAME, LASTNAME and Total Salary of all Clerks from the tables WORKERS And DESIG, where Total alary is calculated as Salary + benefits.

(iv) To display the minimum salary among managers and Clerks From the tables DESIG.

(v) SELECT FIRSTNAME, SALARY ROM WORKERS, DESIG WHERE DESIGINATION = “MANAGER” AND ORKERS.W_ID = DESIGN.W_ID

(vi)SELECT COUNT(DISTINCT DESIGNATION) FROM DESIGN ;

(vii) SELECT DESIGNATION, SUM(SALARY) ROM DESIG GROUP BY DESIGNATION HAVING COUNT (*) < 3;
(viii) SELECT SUM(BENIFTS) FROM DESIG HERE DESIGINATION =”salesman”;

CHAPTER -15

DATABASE TRANSACTIONS

Brief Summary of the Chapter:

Reliability is a quality, which we seek for in everything that we get. The same is applicable to software and to database. A reliable database system is that which retains our database in a consistent state despite occurrence of many failures. Database Transaction is the field which requires utmost consistency. This chapter describes fundamentals of database transactions and its reliable implementation. A database can be called consistent when it follows ACID properties. A transactions can be called reliable when it either COMMITed i.e. successfully all its steps are carried out and changes are permanently reflected in the database or be ROLLBACKed i.e. in case of failures, if transaction cannot be successfully completed then any data changes made by the transaction are brought back to the state that earlier was prior to the execution of this transaction.

KEY POINTS OF THE CHAPTER

TRANSACTION-A set of successive statements that succeed or fail as a group so that all effected statements of the group are retained or all are discarded are called transactions. When a transaction is done on the database is called **database transaction**.

COMMIT-This statement is used to end a transaction and make all changes permanent. Until a transaction is committed, other users cannot see the changes made to the database.

ROLLBACK- The ROLLBACK statement is used to end a transaction and undo the work done by that transaction. After ROLLBACK, it looks like that transaction had never begun.

SAVEPOINT-It is point in a transaction, up till which all changes have been saved permanently.

ACID- It is an acronym of ATOMOCITY, CONSISTENCY, ISOLATION, DURABILITY

(For Details see **SOLVED QUESTIONS**.)

SOLVED QUESTIONS

1. **Define a transaction.**

   Ans. -A transaction is a logical unit of a work that must succeed or fail in its entirely. It is an atomic operation which can be divided unto smaller operations.

2. **What are the two ways in which multiple transactions can be executed?**

   Ans. - Multiple transactions can be executed in one of the following two ways:
   (i) Serially (ii) Concurrently

3. **What is a savepoint?**

   Ans. - Savepoints are special operations that allow you to divide the work of a transaction into different segments. In case of a failure, you can execute rollbacks to the savepoint only, leaving prior changes intact.

4. **What to you understand by a database transaction?**
   Ans. - A database transaction is a logical unit of work that must succeed or fail in its entirely.

5. **Why do understand by transaction COMMIT and ROLLBACK?**
   Ans-COMMITing a transaction means all the steps of a transaction are carried out successfully and all data changes are made permanent in the database. Transaction ROLLBACK means transaction has not been finished completely and hence all data changes made by the transaction in the database if any, are undone and the database returns to the state as it was before this transaction execution started.

6. **What do you understand by ACID properties of database transaction?**

Ans. -To ensure the data-integrity, the database system maintains the following properties of transaction. The properties given below are termed as ACID properties-an acronym derived from the first letter of each of the properties.

(i) Atomicity-This property ensures that either all operations of the transactions are reflected properly in the database, none are. Atomicity ensures either al-or-none operations of a transaction are carried out.

(ii) Consistency-This property ensures that database remains in a consistent state before the start of transaction and after the transaction is over.

(iii) Isolation-Isolation ensures that executing transaction execution in isolation i.e. is unaware of other transactions executing concurrently in the system.

(iv) Durability-This property ensures that after the successful completion of a transaction i. e when a transaction COMMITs, the changes made by it to the database persist i. e remain in the database irrespective of other failures.

7. **What the function is of redo and undo logs?**

Ans. -Every database has a set of redo log files. It records all change in data including both committed and uncommitted changes. Undo logs stored roll backed data.

8. **What TCL commands are supported by SQL?**

Ans. -SQL supports following TCL commands

- **BEGIN |START TRANSACTION**-Marks the beginning of a transaction
- **COMMIT**-Ends the current transaction by saving database changes and starts a new transaction.
- **ROLLBACK**-Ends the current transaction by discarding changes and starts a new transaction.
- **SAVEPOINT**-Defines breakpoints for the transactions to allow partial rollbacks.
- **SET AUTOCOMMIT**-Enables or disable the default autocommit mode.

9. **Which two statements complete a transaction?**

A. DELETE employees;
B. DESCRIBE employees;
C. ROLLBACK TO SAVEPOINT C;
D. GRANT SELECT ON employees TO SCOTT;
E. ALTER TABLE employees
MODIFY COLUMN sal;
F. Select MAX(sal)
FROM employees
WHERE department_id=20;

Ans. - C, E

UNSOLVED QUESTIONS

1. What is the benefit of transaction?
2. What are the five states of the transactions?
3. What will happen when COMMIT statement is issued?
4. What will happen when ROLLBACK statement is issued?
5. How can you start a new transaction?