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പഠന സഹായി

ഹയർ സെക്കണ്ടറി

കമ്പ്യൂട്ടർ അപ്ലിക്കേഷൻസ്

ജില്ലാ പഞ്ചായത്ത്, കാസർഗോഡ്

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മുഖമൊഴി

ഗുണനിലവാരമുള്ള വിദ്യാഭ്യാസം ഓരോ കുട്ടിയുടെയും അവകാശമാണ്. അത് ഉറപ്പു വരുത്തുക എന്നത് നമ്മുടെ കർത്തവ്യമാണ്. വിദ്യാർത്ഥികളുടെ പഠനനിലവാരം മികവുറ്റതാക്കുവാനുള്ള യത്നങ്ങൾ എല്ലാ സ്കൂളുകളിലും നടപ്പിലാക്കി വരുന്നത് ഏറെ സന്തോഷകരമാണ്. ഹയർ സെക്കണ്ടറി വിദ്യാർത്ഥികളുടെ പഠനനിലവാരം ഉയർത്തുവാൻ കാസറഗോഡ് ജില്ലാ പഞ്ചായത്തിന്റെ നേതൃത്വത്തിൽ നടപ്പിലാക്കിവരുന്ന മികവ് പദ്ധതി ജില്ലയിലെ ഹയർ സെക്കണ്ടറി വിജയശതമാനം ഗണ്യമായ രീതിയിൽ ഉയർത്തുവാനും ജില്ലയുടെ വിദ്യാഭ്യാസ പിന്നോക്കാവസ്ഥ ഒരു പരിധിവരെ പരിഹരിക്കുവാനും സഹായിച്ചിട്ടുണ്ട്. ഹയർ സെക്കണ്ടറി പരീക്ഷയ്ക്കുള്ള മുന്നൊരുക്ക പ്രവർത്തനങ്ങൾ എല്ലാ സ്കൂളുകളിലും നടന്നുവരുന്ന ഈ സന്ദർഭത്തിൽ കുട്ടികളിൽ ആശയങ്ങൾ കൂടുതൽ ദൃഡീകരിക്കാൻ ഉതകുന്ന, അദ്ധ്യാപകർക്ക് സഹായകമായ ഒരു കൈപുസ്തകം *'മികവ് 2014'* കാസറഗോഡ് ജില്ലാ പഞ്ചായത്ത് ഈ വർഷവും പുറത്തിറക്കുകയാണ്. ചോദ്യങ്ങൾ, ചർച്ചകൾ, ചെറു ഗ്രൂപ്പ് പ്രവർത്തനങ്ങൾ തുടങ്ങിയവയിലൂടെ ഇത് സാധിക്കുമെന്നു ഞങ്ങൾ വിശ്വസിക്കുന്നു. താഴ്ന്ന നിലവാരമുള്ള കുട്ടികൾക്കും ഉയർന്ന നിലവാരമുള്ള കുട്ടികൾക്കും ഒരു പോലെ ഗുണകരമാകുന്ന വ്യത്യസ്ത നിലവാരത്തിലുള്ള പഠന പ്രവർത്തനങ്ങൾ ഇതിൽ ഉൾപ്പെടുത്താൻ ഞങ്ങൾ ശ്രദ്ധിച്ചിട്ടുണ്ട്. ഈ വർഷം ജില്ലയിലെ മുഴുവൻ കുട്ടികളെയും C+ നു മുകളിലുള്ള ഗ്രേഡുകളിലേക്ക് ഉയർത്തുക എന്ന നമ്മുടെ ലക്ഷ്യം സാക്ഷാത്ക്കരിക്കാൻ ഇത് സഹായകമാകുമെന്ന് ഞങ്ങൾ പ്രത്യാശിക്കുന്നു. അതിനായി ജില്ലയിലെ മുഴുവൻ പ്രധാന അദ്ധ്യാപകരുടെയും, അധ്യാപകരുടെയും, കുട്ടികളുടെയും, രക്ഷിതാക്കളുടെയും നാട്ടുകാരുടെയും ആത്മാർത്ഥമായ സഹകരണവും പിന്തുണയും പ്രതീക്ഷിച്ചുകൊണ്ട്,

പ്രസിഡണ്ട്

ജില്ലാ പഞ്ചായത്ത്, കാസറഗോഡ്.

COMPUTER APPLICATIONS

Resource Team :

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Chapter 1

Introduction to Visual Basic

VB is a programming language, used to develop Windows based application program for clients and servers with Graphical User Interface (GUI). It is developed by Microsoft Corporation. Its editions are Learning Edition (introductory editions for students), Enterprise Edition (for team work programmers), and Professional Edition (for professional developers).

Event Driven Programming

VB is an example for Event Driven Program, because collections of codes are executed, according to the response of an event. In an event driven application codes are executed when an event occurs. It does not follow a predetermined path.In procedural application the application itself controls portions of code which executes and In what sequence.

Integrated Development Environment (IDE)

The working environment of VB is called IDE. Which integrates different functions like design, edit, compile and debug. Also it is an environment for developing application programs. It has 3 states Design, Run and Debug.

VB IDE Components

The components of VB IDE are Title bar, Menu bar, Tool bar, Toolbox, Form designer, Project explorer, Properties window, Form layout window and Code editor window.

Menu bar

It displays the commands used to work with VB. Different menu options are File, Edit, View, Project, Format, Debug, Run, Query, Diagram, Tools, Add-Ins and Help.

Toolbar

It provides short cut icons for quick access to commonly used menu commands eg: opening new project, add form, open, save etc.

Toolbox

It provides a set of tools (controls/objects) used to design the user interface. It includes picture box, Label box, Textbox, Frame, Command button, Checkbox, Option button, Combo box, List box, Hscroll, Vscroll, Timer, Drive list box, Dir list box, File list box, Image box, data etc.

Form designer

Forms are the basic building blocks of VB application It is the actual user interface. Here we can add controls or objects for the interface .

Project explorer Window

It displays the component of a project like forms and modules of a current project. It has 3 buttons for code, object and folder.

Properties window

It displays the property setting of a selected control. So it sets the appearance and behavior (characteristics) of an object.

Form layout window

It allows to position the form when the program is run.

Code editor window

It serves us to entering the application code. It has 2 drop down lists one for Object selection and another for procedure.

VB Project

A project is a collection of files used to build an application. Every application is developed as a project with one form. The default name of project is Project1 and form is Form1. A VB project includes the following files with extension

- One project files with extension .vbp
- One file for each form with extension .frm
- One file for control's property with extension .frx
- One file for each class module with extension .cls
- One file for each standard module with extension .bas

Project File

It contains the list of files and components associated with project.

Forms

It is the basic building block of a VB application .it is the actual user interface, because without form we cannot design an application program. It is also called canvas of an artist. All the other controls are placed in the form, so form is called container control.

Modules

It has no visual interface. It has a code window. It is used to store the procedures and codes for more than one form in a project.

Properties, Methods and Events

Properties are characteristics like appearance and behavior of an object. It includes name, color, height, width etc. Events are actions applied to an object. Methods are responses according to an event.

TV is an object. Its properties include model, color, shape, size, brand, price etc. Events include pressing volume button, pressing channel changing button, pressing power on/off button etc. Method includes increasing/ decreasing volume when volume button pressed.

Building VB Applications

- Open VB IDE

  Start → All Programs → Microsoft Visualstudio6.0 → Microsoft Visual Basic6.0

Select 'Standard Exe' project type from 'new project' window, then

- Create user interface
- Set properties
- Write codes
- Run and Debug
- Save the form and project

Msgbox Function

It is used to provide some information or message from the application program to the user.

Syntax

Msgbox ("PROMPT",[Button], [Title])
Eg:- Msgbox "Hello welcome to VB", vbokcancel, "Welcome Message"
Here prompt is the message to be displayed in the message box.
Button is used to specify a button in the msgbox (eg:vbOkonly, vbYes No Cancel, vb Yes No)
Title is the string displayed in the title bar of dialogbox

Input box Function

It is used to get some text input from user to the application program.

Syntax

Inputbox ("PROMPT", ["Title"], ["Default"])
Eg:- Inputbox "Enter a string", "Sample", "VB"
Here prompt is the string displayed in the dialogbox,title is the string displayed in the title bar of dialogbox,default specifies a string displayed in the text box as default response.

Chapter 2

Building Visual Basic Applications

Elements of a VB form

At the top of the form is the title bar which displays caption. An icon is displayed at the left of the titlebar. It can act as an identifier for form when it is minimized. Clicking this icon opens the control menu. There are three buttons at the right side of the title bar. They are minimize, maximize and close buttons. These three buttons collectively called control box. The major area of the form where controls are placed is called client area.

Properties of from

Properties	Usage	Values
Name	To refer or identify the form by the code.	*form1*
Caption	To set the text on title bar.	*form1*
Border style	To set the style of the form's border and appearance.	0-none:-Form has no border and cannot be resized. 1-fixed single:-Form has borders ,cannot be resized. *2-sizable*:-form has borders and are resizable 3-fixed dialog:-used for dialogbox 4-fixed tool window:-Looks like a toolbar,cannot be resized. 5-Sizable tool window:-Looks like a toolbar ,resizable.

Picture	To provide a back ground picture.	Path name of the picture file.
Icon	To set the icon on the title bar .	Path name of the icon file.
Maxbutton	To specify the maximize button to be display or not.	*True*/False
MinButton	To specify the minimize button to be display or not.	*True*/False
ControlBox	To specify the icon to be Display or not.	*True*/False If it is set to false the title bar will not display controlbox.
Windowstate	To set the initial state of the form.	*0-normal*, 1-minimized, 2-maximized

Events of form

Events	Occurrence	Code Header
Load	When form is loaded to memory.	Private sub form_Load() End sub
Activate	When form becomes the active window.	Private sub form_Activate() End sub
Click	When user presses and releases mouse button over the form at one time.	Private sub form_Click() End sub
Unload	When form is removed from the memory.	Private sub form_Unload(cancel as integer) End sub If cancel is 0 the form is removed.if it is any non zero value which prevents unloading of form.

Methods of form

Methods	Usage	Example
Show	To display a form	Form1.show
Hide	To hide but not unload a form	Form1.hide
Print	To print a line of text on the form	Form1.print "Hello"

Here show method has two arguments. Style and ownerform.

If Style is 0 the form is modeless,if style is 1 the form is modal.

Owner form specifies the name of the form which owns the current form

Common properties of controls

Properties	Usage	Values
Name	To refer or identify the control by the code.Used to specify a name for a control.	List1, command1, combo1,label1 etc.
Appearance	To set the display type	*3D*/Flat
Backcolor	To specify background color of a control	Select a color from palette.
Forecolor	To specify foreground color of text in a control	Select a color from palette.
Font	To specify the font settings.	Font type, style, size,effects etc.
Caption	To display the text on the control.Textbox, Combobx, Listbox do not have caption property.	option1, command1, check1, label1 etc.
Text	To set the text in a control	combo1, text1
Enabled	To specify the control to be respond to an user generated event.	*True*/False
Visible	To specify a control to be visible or not	*True*/False
TabIndex	To set the tab order .The order in which the focus moves from one control to the next when TAB is pressed is known as tab order.	Starting from 0

Common Events of controls

They classified in to two, Mouse events and Keyboard events.

Mouse Events

Event	Occurrence	Code Header
Click	When we presses and releases mouse button only ones	Private sub Command1_Click() End sub
DblClick	When we presses and releases mouse button two times quickly.	Private sub command1_DblClick() End sub
MouseDown	When we presses a mouse button.	Private sub command1_ mouseDown() End sub
MouseUp	When we releases a pressed mouse Button	Private sub command1_ MouseUp() End sub
MouseMove	When mouse moves over an object	Private sub command1_ MouseMove() End sub

The arguments of Mousedown,mouseup,mousemove events are Button,shift,X,Y.Here Button returns an integer that identifies the button that was pressed or released to cause the event.Shift returns an integer that represents the state of the SHIFT,CTRL,ALT keys when the button is pressed or released.X,Y represents the X and Y coordinate of the current location of the mouse pointer.

Keyboard Events

Event	Occurrence	Code Header
KeyPress	When we presses and releases a key on keyboard	Private sub command1_KeyPress(keyascii as integer) End sub
KeyDown	When we presses a key	Private sub command1_KeyDown(keycode as integer,shift as integer) End sub
KeyUp	When we releases a pressed key	Private sub command1_KeyUp(keycode as integer,shift as integer) End sub

*keyascii is an integer that returns a standard numeric ANSI keycode.

*keycode gives the keycode of the pressed key.

*Shift gives an integer that represents the state of the SHIFT,CTRL,ALT keys at the time of the event.

*Keypress event cannot recognize function keys,navigation keys,shift,alt,ctrl keys.Keypress event gives separate ASCII code for uppercase and lowercase letters.

*Keydown event used to handle the keys which is not recognized by keypress.Keydown event returns same code for upper and lower case letters.

Common Methods of controls

Methods	Usage	Example
Move	To move a control to a specified location	Command1.Move
Refresh	To repaint a control	Form1.Refresh
SetFocus	To move the focus to a specified control	List1.SetFocus

Standard Controls in VB

They are Command button, Label, Textbox, Frame, Option button, Check box, Scroll bars, List box, Combo box, Image box, Picture box, Drive list box, Dir list box, File List box and Timer.

Command button

It is used to represent an action that is carried out when the user clicks on it.

Properties	Usage	Values
Default	To access through enter key	True/*False*
Cancel	To choose through Esc key	True/*False*
Style	To specify the display type	*0-Standard*/1-Graphical

*To display a picture on the command button first the style property must be set to graphical then specify a picture using picture property.

Label

It is used to display read only text. These texts cannot edit by the user at run time.

Properties	Usage	Values
Alignment	To align the text	*0-Left*, 1-Right, 2-Center
Autosize	To resize automatically to its content	True/*False*
WordWrap	To display text in multiple lines (Grow down)	True/*False*

Textbox

It is used to display text that can edit by the user. Also it is used to input data from the user to the program.

Properties	Usage	Values
Passwordchar	To set password character	Any symbol (*)
Multiline	To enter text in multiple lines (Address)	True/*False*
Maxlength	To specify maximum characters to the text box	0 to any number
Locked	To set the text as read only	True/*False*

*setting maxlength as 0 means the text may be of any length.Maxlength property limits the number of characters user can enter in a text box.

Frame

It helps us to group other controls, so it is a container control.

Option button and Check box

Option button is used to select one option from multiple options.

Check box is used to select multiple options at the same time.

Properties	Usage	Values
Value	To set the state of control	True/*False* (Option Button) *0-Unchecked*, 1-Checked, 2-Grayed(Check box)
Style	To set the display type	*Standard*/Graphical (Displayed like button)

Scroll bars

They are Hscroll and Vscroll used to navigate the large contents in a control. Also it can use to select or input the values in a range. So it is an input control.

Properties	Usage	Values
Min	To set the minimum value	Integer *(0)*
Max	To set the maximum value	Integer *(32767)*
Value	It returns the current position value of scroll box	Integer *(0)*
Smallchange	Returns the value when we click on scroll arrow	Integer *(1)*
Largechange	Returns the value when we click on scroll box	Integer *(1)*

- Important events of scrollbar are change event and scroll event change event occurs when the user changes the position of the scrollbox and releases the mouse button.Scroll event occurs continuously while moving the scroll box.

List box

It displays a list of item from which the user can select one or more item. A scroll bar is automatically added if the number of item increases.

Properties	Usage	Values
Style	To set the appearance or behavior	*0-Standard*/1-Checkbox
Sorted	To display items in alphabetical order	True/*False*
Listcount	It gives the number of items	Integer value
Selected	To display an item as selected	True/*False*
Listindex	It gives the index of selected item	Integer (starts from 0)
List	It holds the item name in the list	Item names

Methods	Usage	Syntax
Additem	Used to add new item with name and index	List1.Additem "Itemname" Index
Removeitem	Used to remove an item with index	List1.Removeitem "Itemname" Index
Clear	To remove all items in the list	List1.Clear

Combo box

It is a combination of list box and text box. It displays a list of item from which the user can select one item also enter information in the text portion.. A scroll bar is automatically added if the number of item increases. It uses small space than list box.

Properties	Usage	Values
Style	To set the behavior	*0-vbcombodropdown* 1-vbcombosimple 2-vbcombodropdownlist
Sorted	To display items in alphabetical order	True/*False*
Listcount	It gives the number of items	Integer value
Listindex	It gives the index of selected item	Integer (starts from 0)
List	It holds the item name in the list	Item names
Locked	To set the items as read only	True/*False*

- Vbcombodropdown –This is default value.This includes a dropdown list and text box.User can select and type.
- Vbcombosimple –The list portion is always visible.User can select and type.
- Vbcombodropdownlist –Here user can only select an item from the list.

Methods	Usage	Syntax
Additem	Used to add new item with name and index	Combo1.Additem "Itemname" Index
Removeitem	Used to remove an item with index	Combo1.Removeitem "Itemname" Index
Clear	To remove all items from the combo	Combo1.Clear

Image box and Picture Box

These controls are used to display graphics in VB.Picture Box is a container control.Image control is a lighter control it uses less system resources.

Image control

Properties	Usage	Values
Picture	To place graphics	Path of the file
Stretch	To determine whether the control is automatically resized to fit the content.	True/*False*

Picture box

Properties	Usage	Values
Picture	To place graphics	Path of the file
Autosize	To determine whether the control is automatically resized to fit the content.	True/*False*

To load a picture at run time use LoadPicture( )

Syntax:-object.picture=Loadpicture(filename)

File system controls

They are used to accessing file system of the computer. They are Drivelistbox, Dirlistbox, Filelistbox.

Drivelistbox

It is used to display and select the drive in the hard disk of computer. (C:/, D:/, E:/ etc.

Properties	Usage	Values
Drive	It returns the current selected drive	Drive

Event	Occurrence	Syntax
Change	When we change the drive	Private Sub Drive1_Change()

Dirlistbox

It is used to displays and selects the folders in the current selected drive in hierarchical way.

Properties	Usage	Values
Path	Display the path name of the current folder	Pathname

Event	Occurrence	Syntax
Change	When we change the current folder	Private Sub dir1_Change()

Filelistbox

It is used to lists and select files in the specific folder .

Properties	Usage	Values
Path	Display the pathname of the folder whose files are displayed	Pathname
Pattern	To specify types of files to be displayed (Extension)	*.jpg,*.bmp,*.txt
Selected	To specify whether a file is selected or not	True/*False*
Filename	It returns the current file name	Name of the file

Timer

The timer control can execute some code at regular interval of time. Interval is specified in milliseconds. (1 second =1000 milliseconds). It cannot display at run time (invisible to users).

Properties	Usage	Values
Interval	To set the interval	Milliseconds

Event	Occurance	Syntax
Timer	It occurs when the time interval enabled	Private Sub Timer1_Timer()

Sample Questions

1 What are the important properties of List Box

Properties	Usage	Values
Style	To set the appearance or behavior	*0-Standard*/1-Checkbox
Sorted	To display items in alphabetical order	True/*False*
Listcount	It gives the number of items	Integer value
Selected	To display an item as selected	True/*False*
Listindex	It gives the index of selected item	Integer (starts from 0)
List	It holds the item name in the list	Item names

2 Which property of form can be used to hide the control menu?

ControlBox property set to false

3 How will the VB forms border appearance be effected if the border style property is set to 5 ?

5-Sizable tool window:-Looks like a toolbar ,resizable.

4 Can you explain the style property of list box and combo box

List Box Style :-*0-Standard*/1-Checkbox

ComboBox Style: *0-vbcombodropdown*

1-vbcombosimple

2-vbcombodropdownlist

5 Remya is asked to design a form for selecting the answer for a multiple choice question name the control suitable for this purpose

Optionbutton.

Model Questions

1 Help rema to create a text box with more than one line and a capacity of accepting maximum 120 characters

2 Name the method used in VB to add data to a form using a ListBox.

3 Pick the odd one out from the following

(Picture Box, Image Box,Form,Frame)

4 ……event cannot recognize if the mouse button pressed.

a)Mouse Down b)Mouse Up c)Mouse Click d)Mouse Move

5 Distinguish between Load and Active events of a form ?

6 What is the similarity and difference between option button and check box ?

7 Give a brief description on the file System controls in VB ?

8 ……. property helps to find the index of selected item in a List box

9 Categories the following

Move, value, visible, setfocus, backcolor, show, drag, multiline

10 Devi has developed a VB program that implements the use of file system controls. How can she limit the type of files to be displayed in fileListBox.

Chapter 3

ELEMENTS OF VB PROGRAMMING

The important elements to construct VB programs are Data types, Variables, Constants, Operators and Control structures.

Statement:- A line of code in VB that make a valid instruction in VB program
Syntax: - The rule for writing program statement.

Data Types

A data type in a programming language is a set of data with values having predefined characteristics.
The data types available in VB are:-

1. Numerical data type
2. Non Numerical data type

1. Numerical data Type:- These consists numbers which can be used in calculation.

The various numeric data types in VB are:-

Data Type	**Illustration**	**Storage Size**	**Key word for declaration**
Integer	Numeric data without fractional part	2 bytes	Integer
Long integer	Represent whole numbers used to manage numbers having maximum 10 digits	4 Bytes	Long
Single	To represent numbers including fraction	4 Bytes	Single
Double	To represent large factional numbers	8 Bytes	Double
Currency	Usually used to represent financial data	8 Bytes	Currency

1. Numerical data Type:-The values do not participates in calculation

Data Type	illustration	Storage Size	Key word for declaration
String	A group of characters enclosed in double quotes	10 Bytes	String
Date	Uses to manage date and time in some format.	8 Bytes	Date
Boolean	To manage logical variables(TRUE/FALSE) .Used for checking conditions and taking decision	2 Bytes	Boolean

Variant Data Type:-Variant data type can contain any type of data. VB declares variable as variant if we are not giving any data type while declaring the variable. Key word to declare variant data is VARIANT.

Variables

Variables are the storage locations for holding data. VB identifies a variable and its data types though declaration statement

Declaring variables

Declaration statement defines the name and the type of the variable.

In VB variable declared using Dim statement

Syntax:- Dim<Variable Name> AS <Data Type>

eg:-Dim Age As Integer

Dim Name AS String

Snippets:-

a) It is possible to combine declaration statements.(eg. Dim Age as integer, Dim name as string)
b) If the data type is not specified in the declaration ,the variable is treated as **Variant** type(eg :-Dim age)
c) A key word is a pre defined word used to carry out a pre defined specification.
d) Usually VB program starts with OPTION EXPLICIT. This key word indicates that all the variables used in the program must be declares and thereby avoid the existence of undeclared variable

Rules for naming variables

The set of rules to give name for a VB Variable are listed below.

1. Variable name must be unique
2. Variable name should not be a key word
3. Variable name can contain maximum of 255 characters
4. Variable name must begin with alphabet
5. Periods(eg:-Space) and special symbols(except under score) are not permitted in variable name

Constants

Constants are the values stored in a variable. It never changes during the program execution. Constants in VB are classified into Numeric constants and String constants.

1. Numeric Constants

Numeric constants are the numbers with or without fractional part.(Eg:- 245,25.21 etc)

2. String Constants

A group of characters enclosed within double quotes is called string constant.(Eg:- “Welcome”, “123” etc)

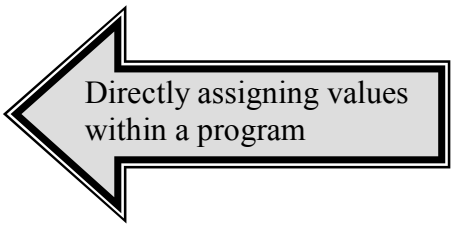
Assigning values to a variable

A constant value can be stored in a variable in two ways.

a) Read the value from the console using the input device
b) Directly assigning values within a program

Example:-

```
Dim Name As String
Dim Age As Integer
Dim Height As single
        Name=”Vimal”
        Age=18
        Height=159.5
```



Operators

Operators are the symbols used for performing operations. Data stored in a variable or constants can be processed using operators. The basic operators in VB are listed below

1. Arithmetic Operators
2. Relational Operators
3. Logical Operators
4. Concatenation Operators

1. Arithmetic Operators

Arithmetic Operators are used for numeric data processing. The Operands and the result of the Arithmetic Operators are numbers. The data types used are Integer, Long Integer, Single, Double and Currency. The operators are listed below.

S.No	Operator	Name of the operator	Example :(A=5, B=2)
1	+	Addition Operator	A+B=7
2	-	Subtraction Operator	A-B=3
3	*	Multiplication Operator	A*B=10
4	/	Division Operators(Returns fractional number)	A/B=2.5
5	\	Integer Division Operator(Returns the Integer part of the result after division	A\B=2
6	MOD	Modulus Operator(Returns the remainder after division)	A MOD B = 1
7	^	Power or exponent Operator (Returns the power of a number)	A ^ B =25 (ie: $5^2 = 25$)

2. Relational Operators

Relational operators are those which compare two quantities and produce the output as TRUE or FALSE

S.No	Operator	Name of the operator	Example :(A=5, B=2)
1	>	Greater Than Operator	A.> B TRUE
2	<	Less Than Operator	A < B FALSE
3	>=	Greater Than or Equal to Operator	A >= B TRUE
4	<=	Less Than Or Equal to Operator	A <= B FALSE
5	=	Equal to Operator	A = B FALSE
6	<>	Not Equal to Operator	A <> B TRUE

3. Logical Operator

Logical operators are used to combine several conditions. Its result will be either TRUE or FALSE .The logical Operators are listed below.

S.No	Operator	Name of the operator
1	AND	Logical AND Operator
2	OR	Logical OR Operator
3	NOT	Logical NOT Operator

3. Concatenation Operator

Concatenation Operator,& is used to join two or more Strings.

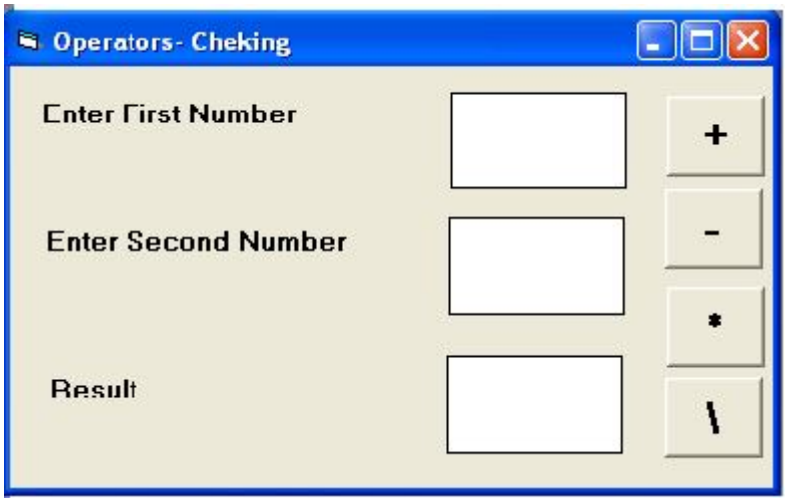
Example:-

Dim A As String, Dim B AS String, Dim C AS String

A=”Welcome”
B= “You all”
C= A& B (Now the variable C holds the joined string “Welcome You all”

Exercise:-Prepare a program to Add, Subtract, Divide and Multiply two numbers

A) User Interface



B) Property Setting

Object	Property	Values
Form-1	Caption	Operators-Checking
Label-1	Name Caption	Label1 Enter First Number
Label-2	Name Caption	Label2 Enter Second Number
Label-3	Name Caption	Label3 Result
Text Box- 1	Name	txtFirst
Text Box- 2	Name	txtSecond
Text Box- 3	Name	txtResult
Command Button 1	Name Caption	cmdAdd +
Command Button 2	Name Caption	cmdSub -
Command Button 3	Name Caption	cmdMul *
Command Button 4	Name Caption	cmdDiv /

C) VB Code

```
Option Explicit
Dim A As Integer
```

```
Dim B As Integer
Dim C As Integer

Private Sub cmdAdd_Click()
    A = Val(txtFirst.Text)
    B = Val(txtSecond.Text)
    C = A + B
    txtResult.Text = C
End Sub

Private Sub cmdDiv_Click()
    A = Val(txtFirst.Text)
    B = Val(txtSecond.Text)
    C = A / B
    txtResult.Text = C
End Sub

Private Sub cmdMul_Click()
    A = Val(txtFirst.Text)
    B = Val(txtSecond.Text)
    C = A * B
    txtResult.Text = C
End Sub

Private Sub cmdSub_Click()
    A = Val(txtFirst.Text)
    B = Val(txtSecond.Text)
    C = A - B
    txtResult.Text = C
End Sub
```

Note:- VAL( ) is used to convert a text into a number

Questions 1

1. Write a VB Program to check whether a number is odd or even

```
N= InputBox" Enter A Number"
Remainder= N MOD 2
    If  Remainder = 0 Then
        MsgBox"The Given Number is Even"
    Else
        MsgBox " The given number is Odd"
    End If
```

2. Differentiate Division Operator and Integer division Operator

Division Operator	Integer division Operator
Returns a fractional number as the result Example: A=3 B=2 A/B gives 105 as the output	Returns only the integer part as the result Example: A=3 B=2 A/B gives 1 as the output

Questions 2

1. Can you predict the output of the following ?
    a. If "boy" < "boy" Then Print "True"
    b. If "10"<= 50 " Then" print "True"
    c. If "5" <="15" Then Print "True"
    d. If "Com" <> "COM" then Print "True"

[Hints:- a) No Output b) Error c) True d) True] Refer Page Number 63 of SCERT Text book]

2. List the rules of naming variable in VB

Questions 3

1. Choose the invalid variable from the list and state the reason
    a. String b. Month2 c. goto d. A-B
    e. 3Month f. _3mark g. Str1 h. 8d
2. Write the VB expression equivalent to the following mathematical expression
    a. A^2+B^2+2AB b. $Y=AX^2+BX+C$
3. Write the mathematical expression equivalent to the VB expressions
    a. X=SQR((b^2-4*a*c)2*a) b. (x^2-b^2)/(3*x^2)
4. State the Significance of the key word Option Explicit.
5. Write a VB program to check arithmetic operators.
6. Say TRUE or FALSE
    a. Variables are names storage locations
    b. Declaration statement defines the variables and data types
    c. Arithmetic operator returns string value
7. Explain operators in VB
8. Differentiate variables and constants in VB
9. ---------- operator gives remainder after division.

Control Structure

In VB programs contains statements and functions to input, output and process data. Normally the execution of statements in a program is in sequential manner. *Control structures are VB statements that alter normal execution sequence of a program* It may be also either selectively or iteratively .The control structures in VB are listed below

3. Decision Statement
4. Looping Statement

Decision Statement

A decision statement contains an expression, which is evaluated first. Depending on the value of expression, program statement block are selectively executed. The decision statements in VB are:

I. IF Statement
II. Select Case Statement

1. IF Statement

The IF Statements in VB in different flavors.

A. IF …..THEN Statement
B. IF……THEN…..ELSE Statement(Block IF Statement)
C. IF……THEN…..ELSE IF Statement(Ladder IF Statement)

A. IF …..THEN Statement

IF ..THEN Statement can have both the single and Multi line syntax

Single Line Syntax

IF<Condition> THEN Statement

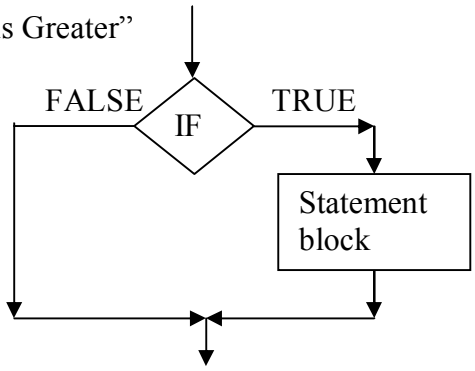
Eg:-IF A > B THEN MsgBox" A is Greater"

Multi line Syntax

```
IF< Condition> THEN
        Statement Block
End If
```

Example:-

```
IF A > B THEN
    Print  A
    MsgBox " A is Greater"
End If
```



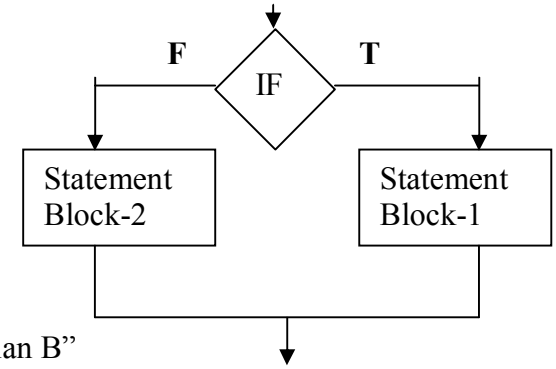
- IF…THEN Statement evaluates the test condition at first
- If the condition is TRUE , the statement block is executed
- If the condition is FALSE , the statement block is not executed

B. IF…..THEN ……ELSE Statement (Block If)

This decision statement contains two statement blocks. If the condition is TRUE the Statementblock-1 (If block) is executed. If the condition id FALSE then statement block-2 (Else block) is executed.

Syntax

```
IF< Condition> THEN
        Statement Block-1
ELSE
        Statement Block-2
END IF
```



Example:-

```
If  A>B Then
        MsgBox" A is greater than B"
Else
        MsgBox" B is greater than or equal to  A"
End If
```

- Here never the both part will executed simultaneously

C. IF ….THEN ……ELSE IF Statement

This statement allows testing multiple conditions (Mutually exclusive) and executing only one set of line of code.

Syntax

```
IF< Condition> THEN
        Statement Block-1
ELSE IF < Condition> THEN
        Statement Block-2

ELSE IF < Condition> THEN
        Statement Block-3
……..
ELSE
        Statement Block-N

END IF
```

11. Select Case Statement

Select Case structure checks different values of an expression and executes according to the values. If the expression has the Value-1 then the statement block-1 is executed .If no match with the value then Else block is executed.

Syntax

```
Select Case <Expression>
        Case <Value-1>
                <Statement Block-1>
        Case <Value-2>
                <Statement Block-2>
 ……
 ….……..
        Case Else
                <Statement Block-n>
End Select
```

```
        DayNo=Val(Text1.Text)
Example:-  Select case DayNo
        Case 1
                MsgBox”Monday”

        Case 2
                MsgBox”Tuesday”
        Case 3
                MsgBox”Wednesday”
        Case 4
                MsgBox”Thusday”
        Case 5
                MsgBox”Friday”
```

```
Case 6
        MsgBox"Saturday"
Case 7
        MsgBox"Sunday"
Case Else
        MsgBox" Please give numbers from 1 to 7 only"
End Select
```

Looping Statement

Looping statement are used for executing a group of statement repeatedly. Loop statement reduces size of the code and increases the execution time. The main loops available in VB are listed below.

1. Do…..Loop Statement
2. While…Wend Statement
3. For…..Next Statement

1. Do…..Loop Statement

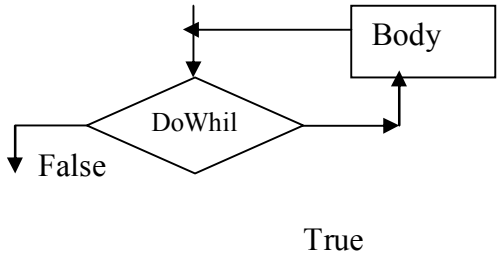
Do…..Loop Statement executes a group of statement (Body of the loop)based on a condition. This condition evaluates first and execution follows.

a) Do While …Loop

We can use Do While….Loop when we want to test the condition at first. If the condition evaluates TRUE ,then only the body of the loop will be executed. If the condition is FALSE then the control will exit from the loop.

Syntax

```
Do While<Condition>
        <Body of the loop>
Loop
```



Example:-

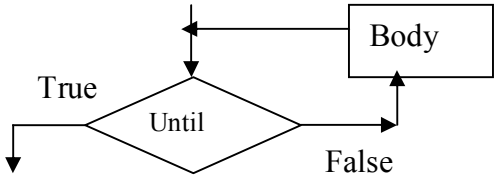
Loop Statement	Output
I= 1 Do While I<=5 Print I I=I+1 Loop	The output will be 1,2,3,4,5
I= 1 Do While I<=5 Print I Loop	It hangs the computer after printing 1.(Reason: There is no increment operation)
I= 20 Do While I<=5 Print I I=I+1 Loop	Body of the loop will not be executed(Reason:-The condition is false at the first iteration itself)

b) Do Until….Loop

In Do Until ..Loop the body of the loop executes when he condition is FALSE. If the condition is True the control will exit from the loop.

Syntax

```
Do Until<Condition>
        <Body of the loop>
Loop
```



Example:-

```
    I=1
Do Until I > 5
    Print I
    I=I+1
Loop
```

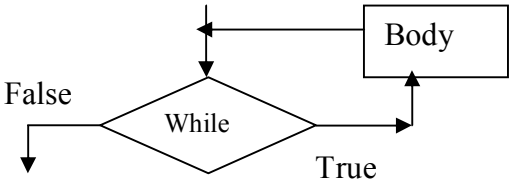
Output:-1,2,3,4,5

2. While …Wend

While ..Wend statement executes body of the loop based on the condition. It is similar to Do..While..loop statement.

Syntax

```
While <condition>
        <Body of the Loop>
Wend
```



Example:

```
    I=1
While I <= 5
    Print I
    I=I+1
Loop
```

Output:-1, 2,3,4,5

3. For….Next Statement

The execution of the For….Next statement is not based on conditions but it is controlled by a variable called control variable. It starts with an initial value. The value is then incremented / decremented to reach the final value of the control variable.

We can use this loop when we know exactly how many times the code must be repeated.

Syntax

FOR <Counter-Var >=<First Value> To <Last Value>[<step inc/dec]

<Body of the Loop>

NEXT [<Couter –Var>]

Example:-

```
For I = 1 to 5
        Print I
Next I
```

Output: - 1, 2,3,4,5

Nesting of control structures

A control Structure within another control structure is called a nested control structure

The inner control structure is executed before the outer control structure.There are four types of nesting in VB .

1. A decision structure within another decision structure
2. A decision structure within a loop structure
3. A loop structure within a decision structure
4. A loop structure within another loop structure

Example:-

```
For I= 1 To  10
        For J = 1 To 5
                Print I,J;
        Next J
Next I
```

Programming Tips

In order to increase the readability of the code, it is good to practice the following tips.

1. **Indentation:-**It means the arrangement of the program code by leaving proper space and keeping it in same line
2. **Comments:-** Comments are the statements inserted in a program to increase the readability. It is not for execution. In VB comments statement begin with single quotation

Exit Statement

The Exit statement used to terminate a loop structure in between its execution based on some condition.

- Exit For statement is used in For Loop
- Exit Do statement is used in Do Loop
- Exit Sub statement is used to exit from a subroutine

Example:-

```
For I = 1 To 10
        IF I =5 Then Exit For
        End if
Next I
```

Output:- 1,2,3,4

GOTO Statement

GoTo statement is used for unconditional jump

If program need to move the execution from one point another **goto** statement can be used.

This is done using label separated by colon (;)

Example:-

```
A=Val(Text1.Text)
B=Val(Text2.Text)
        IF B= 0 THEN GoTo Error
                C=A/B
        End If
        TxtResult.Text=C
        Exit Sub
Error: MsgBox"Sorry Zero Divisor…"
```

END Statement

The **END** statement closes all operating windows and releases all variables used by the program

Questions 1

1. Rectify the following code and rewrite it to get an output

```
If   X>Y, Y>X
        Print X
End If
```

[Hints:- syntax of If statement, Incorrect comparison etc]

2. Find the error in the following code.

```
Private Sub CmdError_click( )
        Sum=0
        For  I =  20 to 10
                Sum = sum + 1
        Next I
End Sub
```

[Hints:-Step clause is missing .The control will not be entered in to the loop]

Questions 2

1."Goto" is an unconditional Jump statement in VB". Comment and illustrate it with an example

(Refer Page No: 78 of SCERT text Book HSE II)

2. Write a VB Program to find sum of first N natural numbers

(Refer Page No: 72 of SCERT text Book HSE II)

3. Write a VB program to find largest among three numbers

(Refer Page No: 75 of SCERT text Book HSE II)

Questions 3

1. Write a VB code statement that gets the age of the user through an input box and prompt the user is eligible to cast the vote(Hint:- The minimum age is 18 to caste the vote)
2. Differentiate decision structure and looping structure
3. Illustrate Block If statement with example
4. Write a note on nested control structure
5. Say TRUE or FALSE
    a. Exit statement terminates the execution of a loop
    b. In Select Case statement the test expression evaluate numerical value
    c. In If ….Then ….Else statement both conditions executed simultaneously
6. Write VB program to generate multiplication table of a number
7. Write a program to find sum of N numbers
8. Write a VB program to find sum of all numbers up to N which are divisible by 7

Unit Test

1. What is the output of the following statement? (2)

```
I =1
Do While I <20
        Print I
        If I > 10 the exit do
        I = I+2
Loop
```

2. What is a variable ? How much storage size is needed if a variable is declared as follows?
   Dim A As Double (2)
3. Develop a program to enter register number and mark of 3 subjects calculate total marks and
   display "Pass" if total mark >50 otherwise Print "fail" (3)
4. Rewrite the following code segment using select case (4)

```
Colorcode = ucase ( text1.text)
        If (colorcode = "W")then
                Msgbox "Selected Colour is White"
        Else
        If (colorcode = "O")then
                Msgbox "Selected Colour is Orange"
        Else
        If (colorcode = "G")then
                Msgbox "Selected Colour is Green"
        Else
        If (colorcode = "V")then
                Msgbox "Selected Colour is Violet"
        Else
                Msgbox "Wrong colour selection"
        End If
End Sub
```

5. Compare Do While .. loop with Do Until.. Loop structure in VB (3)
6. Give the use of exit statement in VB (1)
7. Write a note on comments in VB (2)
8. Differentiate Division Operator and Integer division Operator (3)

Chapter 4

Arrays and Procedures

Array is the sequence of memory location that is used to hold same type of data. ie an array contains homogenous elements .Arrays can be one dimensional or multi dimensional.One dimensional array requires only one index to access the elements.Multi dimensional arrays require more than one index to access the elements.

Declaration syntax

age(0)	51
age(1)	42
age(2)	31
age(3)	21
age(4)	15
age(5)	17

Dim array name (size) as datatype

Eg: Dim age (5) as integer

It can hold 6 values. The first element is represented by using the subscript age (0), second is age (1) and last is age (5).

Basic operations on arrays

Array traversal: - Visiting and processing the elements in an array is called traversal.

Linear search: - Process of searching sequentially the element in an array is called linear search.

Example:-

Program to accept 10 marks from the user on loading the form and display the total marks in a text box.

```
Dim mark(10) as integer                          'Array declaration
Private sub Form_Load( )
Dim   i , total  as integer                      ' Variable Declaration
        For   i  = 1  To    10
                Mark(i) = InputBox("Enter mark" & i)        'Input  statement
        Next i
                Total = 0                                   'Variable initialization
        For  i  = 1 To 10
                Total = Total + Mark(i)                     'Finding Total
        Next i
                Text1.text= Total                           'Displaying Result
End Sub
```

Qn. Which are the basic operations in an array

Linear search and Traversal

Procedures

Every VB application is made up of small, self contained segments or group of codes is called procedures. It allows dividing a big program into small units. This approach is called ***modular approach.*** It enhances the execution speed and can easy to debug. So procedure contains a collection of instructions that can solve a specified task. Procedures are divided into two. They are **Subroutines and functions.**

Subroutines

A subroutine is a group of instructions that have a specific name and can carries out a well defined task. Here instructions are placed in between 'Sub' and 'End Sub' commands. '**Arguments'** are the values passed to a subroutine . Consider the code given below

```
Sub    simpleinterest(P as Integer, N as Integer, R as Integer)   'Subroutine for calculating SI
        Dim I as   integer
        I=P*N*R/100
        Msgbox "Simple interest=" &I
End Sub
```

This can be invoked using this,

```
Private sub command1_click( )
     simpleinterest  10000, 4, 7                    'Subroutine call
End Sub
```

Here the subroutine works with the values that are passed with the calling statements.

Argument passing mechanism

To a subroutine arguments can be passed in two ways.

1. Passing arguments By Reference
2. Passing arguments By Value

Passing arguments By Reference

The key word '***Byref'*** is used to pass the arguments to the subroutine. In pass by reference method we actually pass the variable itself. Any changes made to the argument by the procedure will be permanent. **The default mechanism is passing by reference**.

Example: **Program to swap two integers using subroutine.**

```
Sub swap(Byref  a  as  integer, Byref  b  as  integer)
     Dim t as integer
      t=a
      a=b
      b=t
End Sub
```

We can call the subroutine by the given code.

```
Private sub command1_click( )
        Dim p as integer, q as integer
        p=20
        q=10
        swap    p,q

This will display p=10 and q=20
        msgbox p, q
End Sub
```

Passing arguments By Value

The key word '***Byval'*** is used here. In pass by value method we actually passing copy of the variable .Any changes made to the argument by the procedure would not affect the actual variable .

Example: **Program to swap two integers using subroutine.**

```
Sub   swap(Byval  a   as integer, Byval    b    as integer)
       Dim t as integer
         t=a
        a=b
        b=t
End Sub
```

We can call the subroutine by the given code.

```
Private sub command1_click( )
        Dim p as integer, q as integer
        p=20
        q=10
        swap p,q
        msgbox p, q      →    This  will display p=20 and q=10
        End Sub
```

Optional Arguments:-

Consider the code

```
        Sub    simpleinterest(P as Integer, N as Integer, Optional R as Integer)
               Dim I as   integer
                      If  IsMissing(R)  then
                      R = 10
                      End if
                I=P*N*R/100
                  Msgbox "Simple interest=" &I
```

End Sub

This can be invoked using this,

```
Private sub command1_click( )
    simpleinterest  10000, 4                    'Subroutine call
End Sub
```

Here the key word **optional** allows the user to call the subroutine without argument '**R**'.
In the subroutine call first value assigned to' **P**' and second value assigned to '**N**'.
IsMissing( ) tests whether an argument value is missing or not,then **R** is assigned a fixed value.

Event Handling Procedures

Event handlers are the subroutines that are executed on the triggering of an event.

Questions

1. The value passed to a procedure is known as …….

   Argument

2. Explain the different argument passing mechanisms

   Explanations of Pass by value and pass by reference method

Functions

There are many functions that are built inVB.These are called Buit in functions.These functions are defined by the VB compiler. **It returns a value also.**However VB allows the user to create his own functions,these functions are called User defined functions.

Built in functions are classified into five.

1. Math functions
2. String functions
3. Date functions
4. Conversion functions
5. Miscellaneous functions

1.Math functions

abs( )

It returns the absolute value of a number.

Eg:- abs(-12) It returns the value 12 abs(+12) It returns the value 12

sqr( )

It produces the square root of the argument.

Eg:- sqr(64) It returns the value 8

2.String functions

Lcase( )

It is used to convert all the uppercase into lowercase

Eg:- Lcase ("VISUAL") Its output is 'visual'.

Ucase( )

It is used to convert all the lowercase into uppercase

Eg:- ucase (“ visual”) Its output is ‘VISUAL’

Ltrim( )

Which returns a string without spaces at the beginning.

Eg:- Ltrim(“ VISUAL BASIC”) Its output is ‘VISUAL BASIC’

Rtrim( )

Which returns a string without spaces at the end.

Eg:- Rtrim(“VISUAL BASIC ”) Its output is ‘ VISUAL BASIC’

Trim( )

It eliminates the blank spaces of left and right side of the string.

Eg:- trim(“ VISUAL BASIC ”) Its output is ‘VISUAL BASIC ‘ ‘

left( )

It helps us to bring a specified number of characters from the left side of the string.

Eg:- left(“ WELCOME TO VISUAL BASIC ”, 7) It produces the output as ‘WELCOME’

right( )

It helps us to bring a specified number of characters from the right side of the string.

Eg:- right(“ WELCOME TO VISUAL BASIC ”, 12) It produces the output as ‘ VISUAL BASIC ‘

mid( )

It helps us to bring a specified number of characters from the middle of the string.

Eg:- mid(“ WELCOME TO VISUAL BASIC ”, 12, 6) It produces the output as ‘ VISUAL ’

instr( )

It is used to produce the position number of a second string on the first string.

Eg:- instr(“ WELCOME TO VISUAL BASIC ”, “ VISUAL ”)

It produces the position number as 12

3.Date functions

date( ) :- It returns the current system date. Eg:- msgbox date

now( ): It display the current system date and time. Eg:- msgbox now

time( ):- It display the current system time. Eg:- msgbox time

weekday( ) ;- It returns the integer number corresponding to the day ranges from 1 to 7.which takes one argument of date type.

```
Dim dt As Date
dt = Date
```

MsgBox weekday(dt)
It displays 2 if the day is Monday.

month( );- It returns the integer number corresponding to the month ranges from 1 to 12.
Eg:- Dim dt As Date
dt = Date
MsgBox Month(dt)
It displays 8 if the month is August.

day( ):- It returns the integer number ranging from 1 to 31.representing the day of the month.
Eg:-Dim dt As Date
dt = Date
MsgBox Day(dt)
It displays 12 if the date is 12.

year( ):- It returns the integer number corresponding to the year.
Eg:- Dim dt As Date
d t = Date
MsgBox Year(dt)
It displays 2013 if the year is 2013.

datediff( )
It help us to find the time intervals between two dates.
Syntax: Datediff(interval,date1,date2)

Values	Description
d	days
m	months
n	minute
s	Second
y	year

Eg:- MsgBox DateDiff("d", #25/5/2013#, #30/06/2013#)
It produces 36 .

4. Conversion functions

val( )
Normally the content entered in a text box is of string type. It is used to convert the string data to a numeric data .
Eg:- val(text1.text)

str( )
It treat a number as a string.
Eg:- str(300)

Here 300 is treated as “300”

asc( )

It converts the character to the corresponding ASCII code.

Eg:- asc(“A”) returns the value as 65 and asc(“a”) returns the value as 97.

chr( )

It converts the ASCII code to corresponding character.

Eg:- chr(65) returns the character as “A” and chr(97) returns the character as “a”.

format( )

It is used to display a numeric data in a specified format.

Eg:- format(75657.938849, “#,##.##”)

Its output is 7,5657.93

5. Miscellaneous functions

line( )

To draw lines on form object by specifying starting coordinate and ending coordinate with color

Syntax:**Line(x1,y1)-(x2,y2),[colour],[B],[F]**

‘ B’ argument used for drawing boxes.

‘BF’ argument used to draw a box filled with colour.

Eg:- line(500,1000)-(1500,2000), Vbblue,BF .This will draw a box filled with blue color with (500,1000) as one vertex and (1500,2000) as the opposite vertex.

circle( )

It is used to draw circle on a form object with center point, radius and color.Radius is measured in twips.

Syntax: **circle(x,y),r,colour**

Eg:- circle(3000,2000), 1000, vbred

rgb( )

It is used to specify color combination of red, green and blue. Here maximum value of each color is 255 and minimum is 0

Eg:- rgb(255,0,0)It produces red color, rgb(0,0,0) - Black, rgb(255,255,255)White , rgb(255,255,0) ->yellow

rnd( )

It returns a random number less than 1 and greater than or equal to zero.

Eg:- msgbox rnd( )

Random no. betwn the range 0 and 29 :int(Rnd()*100)mod 30

Random no. betwn the range 0 and 255 : int(Rnd()*1000)mod 256

Questions

1. Name any three conversion functions in VB which returns a string as out give
   Chr( ), str( ) ,format( )
2.. Write any to string functions available in VB with their use in the program

Lcase( )

It is used to convert all the uppercase into lowercase
Eg:- Lcase ("VISUAL") Its output is 'visual'.

Ucase( )

It is used to convert all the lowercase into uppercase
Eg:- ucase (" visual") Its output is 'VISUAL'

Model Questions.

1 Write a sub routine for swapping two integers X and Y
2 Name the function in VB used to return a specified number of characters from the middle of a string
3 The marks of 10 students are stored in an array. Write a VB program to find the Largest Mark Obtained by the students
4 Consider the following sub routine

```
Sub ShowFact (N as Integer)
 Dim I, F as Integer
 F=1
 For I =1 to N
 F=F*I
 Next I
Msgbox F
End Sub
```

a) How will you call this sub routine with the argument 5
b) What will be displayed on the message box if 3 is given as argument

5 Briefly explain the different methods available in VB for drawing purpose
6 Choose the valid index for an array element from the following (-2 , 0,3.5, none)
7 What is the use of keyword optional with variable names in the argument list used with subroutine ?
8 Write the use of the following function and predict the output of the following VB statement.
(a) Left("Public Examination",5) (b) Mid("Final Examination",6,5)
9 Differentiate between functions and procedures.
10 Arun wants to calculate the remaining days available for his public examination from current day.
(a) Name the date function available in VB for this.
(b) Write equivalent VB statement for this.

Chapter 5

Database Programming in VB

Database

A database is a collection of information stored in structured manner. This information can be retrieved when ever needed and process as require and store.

DBMS (Database Management System)

We need some programs to interact with the information (database) stored. Such interaction is performed by a Database management system.

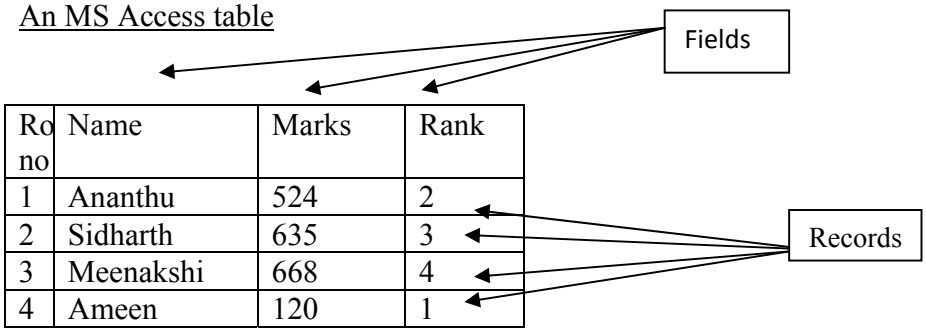
DBMS is a collection of data and programs to manipulate the database.
Some of the DBMS softwares are MS Access, ORACLE, SQL Server etc

MS Access

We use **MS Access** as the **back end tool** for design the database in VB applications

It contains tables. In table, information is stored in fields (columns) and records (rows).

An MS Access table



Ro no	Name	Marks	Rank
1	Ananthu	524	2
2	Sidharth	635	3
3	Meenakshi	668	4
4	Ameen	120	1

The data stored in this way (Database in MS Access) can be linked with a VB application externally.

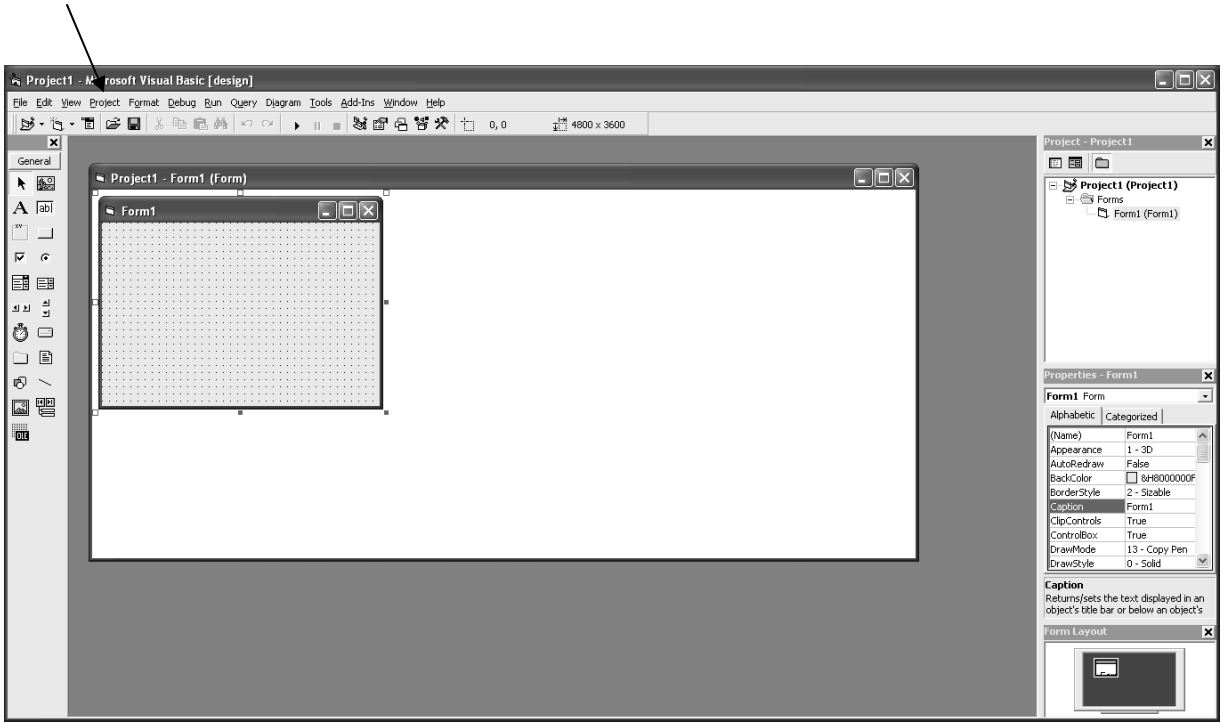
Visual Data Manager

Visual Data Manager is the add in tool available in VB for the creation of access style database

Suppose we have to create a database **school.mdb** and a table **student** in the school database.

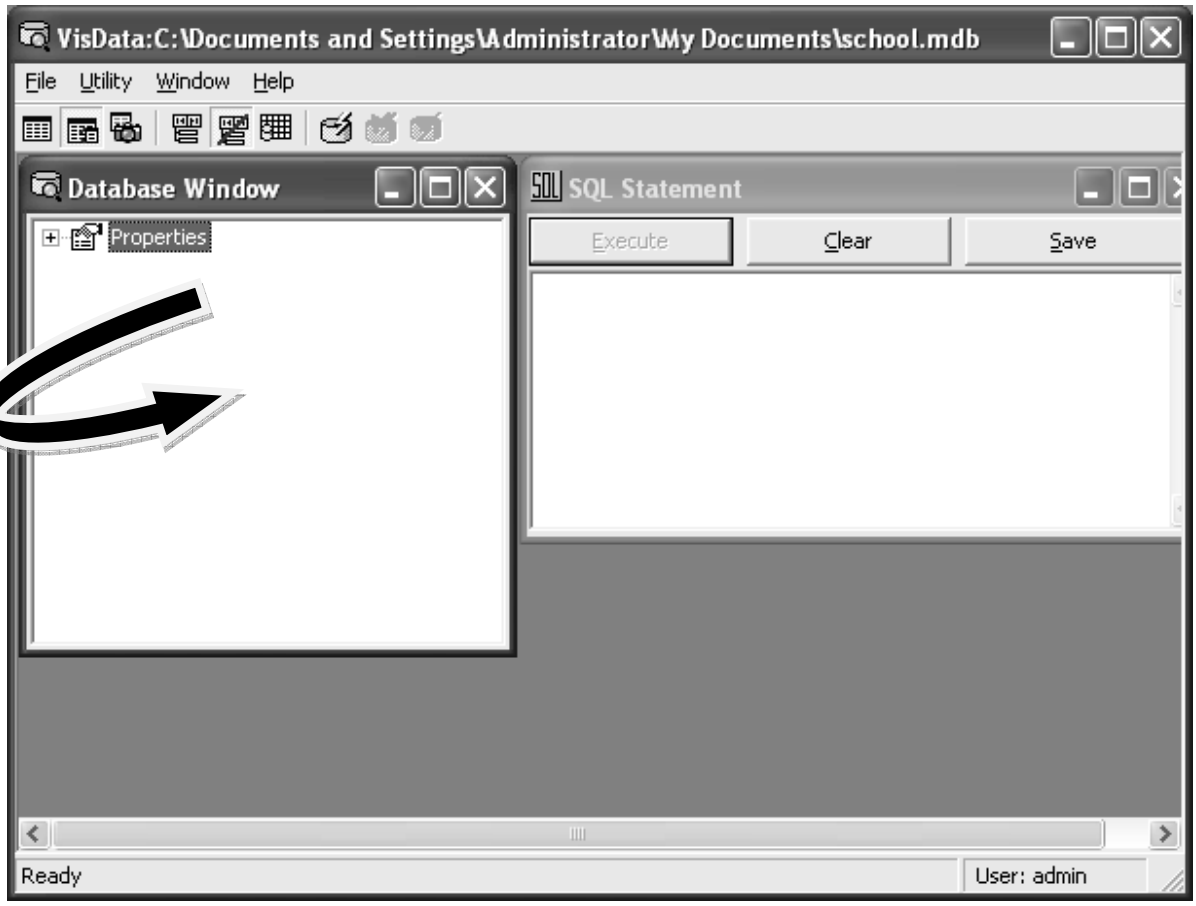
Step 1: Create the database.

Click **project** menu-----> From Visdata window select the database type and then give the name as school.mdb



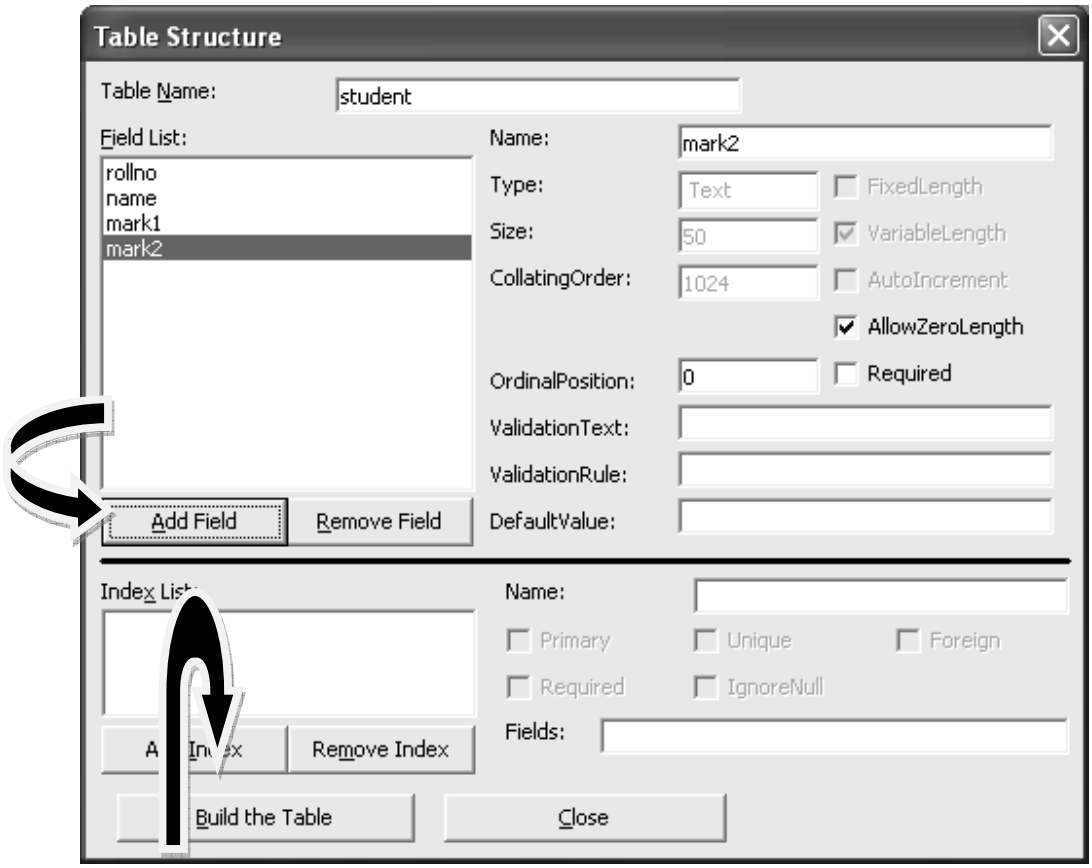
Step 2: Creation of table

Right click on the database window of school.mdb and click **new table** option

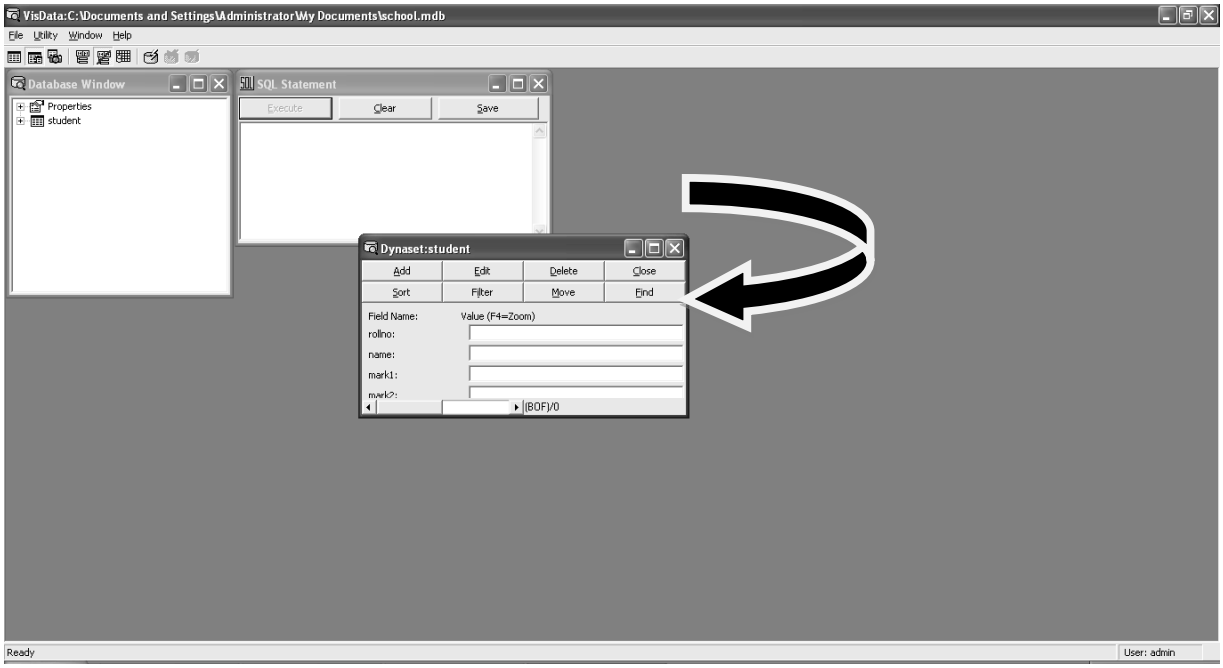


Step 3: Adding fields and building table.

Enter the **table name**. Then design the structure of the table by clicking **'add field'** button. Click **build table** button after entering all the fields.



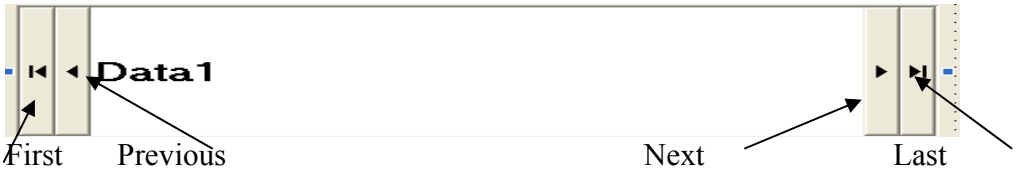
Step 4: Entering data in table
Double click the table icon. Using 'update' and 'add' button enter all the records.



Now we have completed the Database creation

The next step is how to connect this database with the application

DATA CONTROL



It is a control used for accessing the database (table) from an application

Properties

- **Connect** : To indicate the type of Data Base.
- **Database name** : Contains the path name.
- **Record source** : To Select the table.
- **Read-only** : To specify Whether read-only or not.
- **Record set type** : Indicate whether Dynaset, Snapshot, table

What is a record set?

It is the Collection of records from one or more tables. There are three different types of record sets.

- **Dynaset** – It can be created using SQL statements
  Updating will be effected to the database.
- **Snapshot** – Can be created using SQL
  Not capable of updating the database
- **Table** – Contains records from one table
  Updating possible

Try your self….?

1. ……..Control is used for navigating through the database

2 Collection of records from one or more table is known as ……..

Record Set Navigation

Record set Navigation means locating different records of the table.

Data bound textbox control

It is a control (textbox) c**onnected** to a Data control.

There are two methods for record set navigations

1. **Directly by using data bound textbox control**

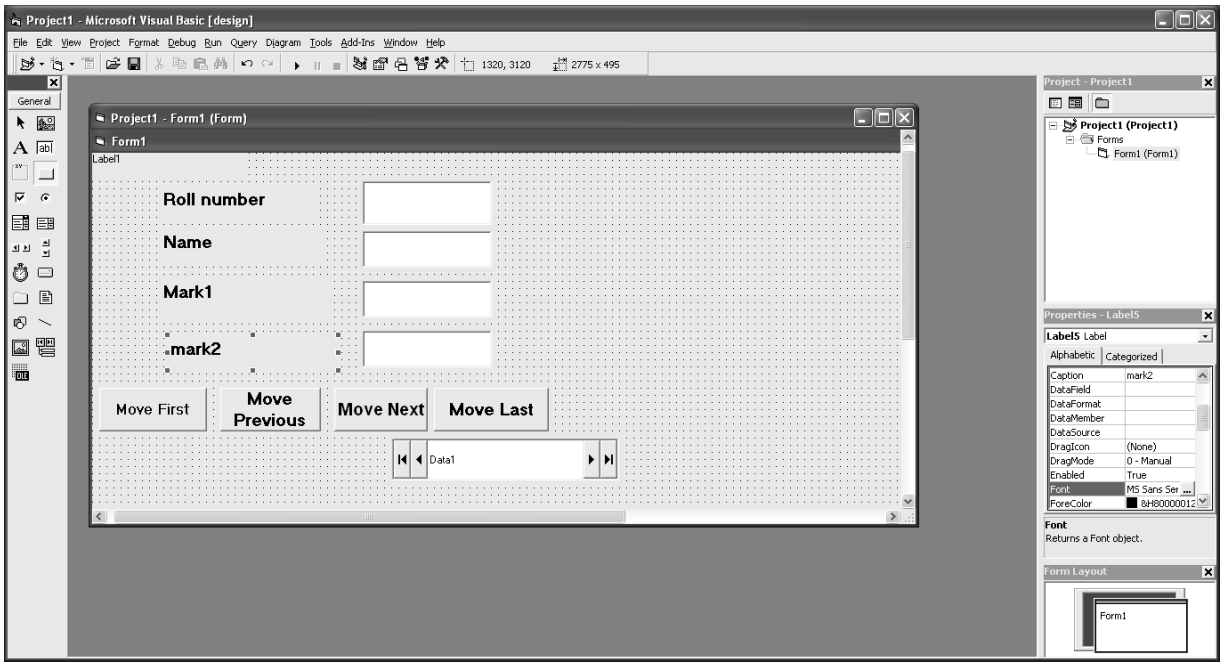
Make a textbox control as the databound text box control by connecting it with data control. So we have to set the following properties of the textbox control to connect the textbox with the Data control.

- **Data source** – Specify the Name of the data control to be connected
- **Data filed** – Set any one of the fields of the table

When we set these two properties, the textbox control becomes **data bound textbox contro**l. *Now the data in the respective records are in data bound textbox control.* The **four buttons** in the data control can be used for navigation.

Let us consider an example
Use **school.mdb** containing **student** table as the source database for the following application

Create the interface as given below



Property settings

Label 1	Caption	Roll no
Label 2	Caption	Name
Label 3	Caption	Mark1
Label 4	Caption	Mark2
Data control	Name	Data 1
	Caption	Useme
	Data base name	School.mdb
	Record source	Student
Textbox1	Name	Txtroll
	Data source	Student
	Data field	Rollno
Textbox2	Name	Txtname
	Data source	Data1
	Data field	Name
Textbox 3	Name	Txtm1
	Data source	Data1
	Data field	Mark 1
Textbox4	Name	Txtm2
	Data source	Data1
	Data field	Mark 2

Using the **four buttons** of data control we can navigate through the

Records and the data will be displayed in **data bound textbox** control.

Remarks: No code for this application

2. Using methods of record set property of data control

In this method the programmer can control the navigation through the code. Different methods of record set properties of data control are given below

A. Move Methods

Movefirst – Position the record pointer in the first record
Movnext - Position the record pointer in the next record
Moveprevious – Position the record pointer in the previous record.
Movelast – Position the record pointer in the last record

Syntax

Datacontrolname.recordset.methodname

Eg : Data1.recorset.movefirst
: Data1.recorset.movenext
: Data1.recorset.moveprevious
: Data1.recorset.movelast

B. Find methods

If we want to locate the records based on a **criteria** we can use find methods

Findfirst – Position the pointer in the first record based on a condition.
Findnext – Position the pointer in the next record based on a criteria.
Findprevious – Position the record pointer in the previous record satisfies condition.
Findlast – Position the record pointer in the last record based on a criteria.

Syntax

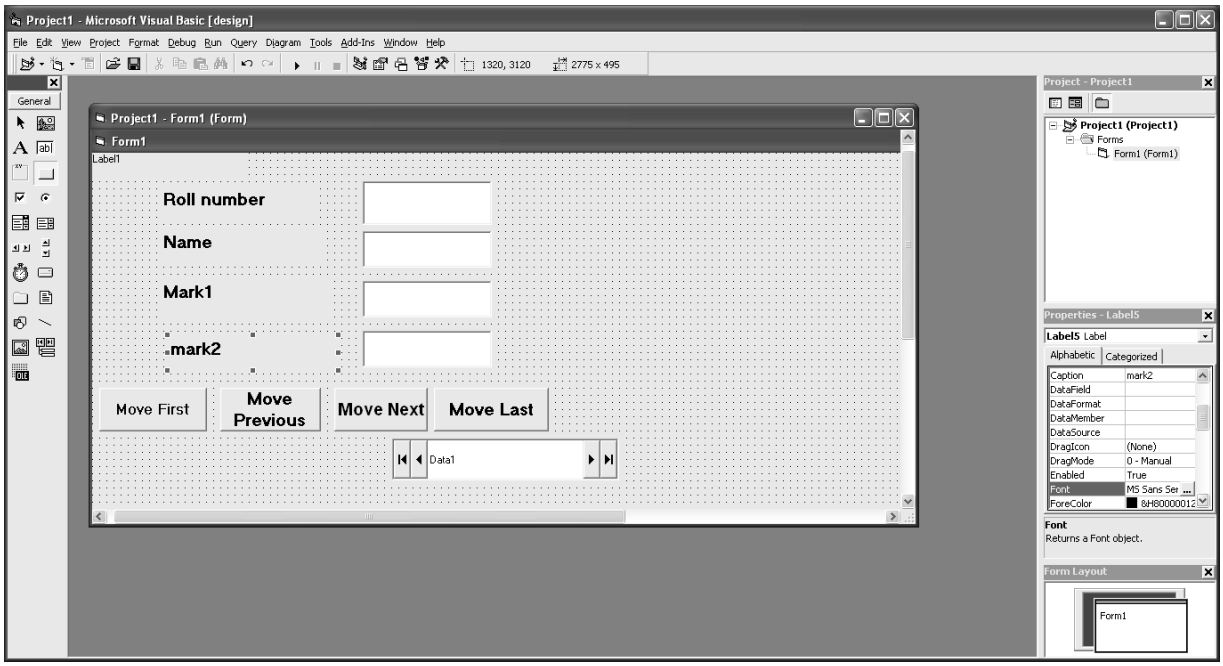
Datacontrolname.recorset.findfirst criteria

Eg: Data1.recordset.findfirst “mark1>=80”

Eg:Let us see the above example once again

Place 4 more command buttons on the form window and set the properties as given below

Remark: During Navigation there may be chances of reaching the end of the recods or beginning of the recordset.End of the recordset is detected by **EOF** property of the recordset.Beginning of the recordset is detected by **BOF** property.



Label 1	Caption	Roll no
Label 2	Caption	Name
Label 3	Caption	Mark1
Label 4	Caption	Mark2
Data control	Name	Data 1
	Caption	Useme
	Data base name	School.mdb
	Record source	Student
Textbox1	Name	Txtroll
	Data source	Student
	Data field	Rollno
Textbox2	Name	Txtname
	Data source	Data1
	Data field	Name
Textbox 3	Name	Txtm1
	Data source	Data1
	Data field	Mark 1
Textbox4	Name	Txtm2
	Data source	Data1

	Data field	Mark 2
Control	Property Name	Setting
Command 1	Name	cmdfirst
Command 2	Name	cmdlast
Command 2	Name	cmdnext
Command 2	Name	cmdprevious

Enter the following code in the code editer window

```
Private sub cmdfirst_click()
Data1.recordset.movefirst
End sub

Private sub cmdlast_click()
Data1.recorset.movenext
End sub

Private sub cmdnext_click()
Data1.recordset.movenext
If data1.recordset.Eof=true then
        Msgbox "last record"
        Data1.recordset.movefirst
End if
End sub
Private sub cmdprevious_click()
Data1.recordset.moveprevious
If data1.recordset.moveprevious then
        Msgbox "first record"
        Data1.recordset.movelast
End if
End sub
```

Accessing data

Suppose we want to access the data stored in a particular record then the data can be extracted using **fields** property of the recordset

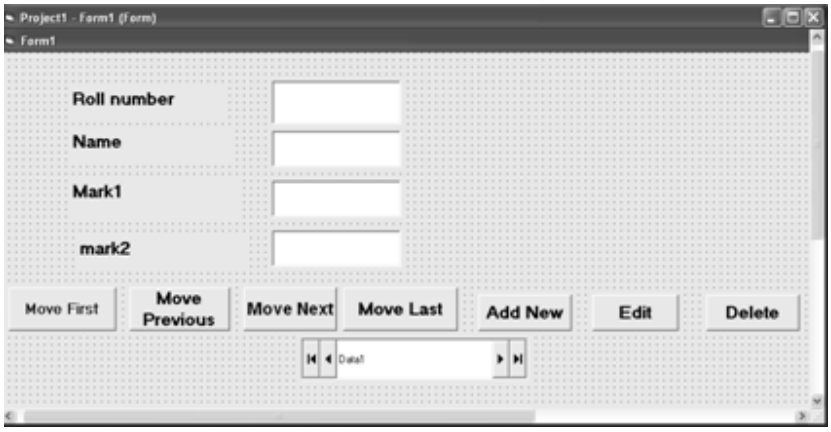
Syntax Data1.recordset.fields(Fieldname) (Based on field name	**Example** Data1.recordset.fields("rollno") (Based on field name)
Syntax Data1.recordset.fields(Field Index) (Based on field Index)	**Example** Data1.recordset.fields(0) (Based on field index)

Record Set Manipulation

For advanced programming just accessing the records in a table is not sufficient. We need to modify the content of the database. For this we have different methods.

1. AddNew – To add a blank record at the end of the record set.
   Usage: data1.recordset.addnew
2. Delete – To delete the current record
   Usage: data1.recordset.delete
3. Update – To modify the records.
   Usage: data1.recordset.update

Consider the same interface given above



Property settings

Label 1	Caption	Roll no
Label 2	Caption	Name
Label 3	Caption	Mark1
Label 4	Caption	Mark2
Data control	Name	Data 1
	Caption	Useme
	Data base name	School.mdb
	Record source	Student
Textbox1	Name	Txtroll
	Data source	Student
	Data field	Rollno
Textbox2	Name	Txtname

	Data source	Data1
	Data field	Name
Textbox 3	Name	Txtm1
	Data source	Data1
	Data field	Mark 1
Textbox4	Name	Txtm2
	Data source	Data1
	Data field	Mark 2
Command 1	Name	cmdadd
Command 2	Name	cmdlast
Command 3	Name	cmdnext
Command 4	Name	cmdprevious

```
Private sub cmdadd_click()
Daat1.recordset.addnew
End sub


Private sub cmdupdate_click()
Data1.recordset.edit
Data1.recordset.update
End sub

Private sub cmddelete_click()
Data1.recordset.delete
End sub
```

Questions

1. **Discuss the various steps to create database using the add in tool visual Data Manager**

   Visual Data Manager is the add in tool available in VB for the creation of MS Access style databases

   Step 1 Creation of the Database

   Take Visual Data Manager from Add-Ins menu.A window titled Vis Data is displayed Click File-New-Access-Version &.0-Give a name for the Database

   Step2 Creation of the table

   From the database window for school.mdb, right click on the

window and click new table option.

Step 3: Adding fields and building table.

Enter the table name. After that enter the table structure by clicking 'add field' button .After entering all the fields click build table button.

Step 4: Entering Data in table
Double click the table icon. Using 'update' and 'add' button enter all the records.

2 Explain various move methods of record set property of data control (3)

A. Move Methods

Movefirst – Position the record pointer in the first record Movnext - Position the record pointer in the next record Moveprevious – Position the record pointer in the previous record. Movelast – Position the record pointer in the last record

Syntax

Datacontrolname.recordset.methodname

Eg : Data1.recorset.movefirst
: Data1.recorset.movenext
: Data1.recorset.moveprevious
: Data1.recorset.movelast

3 Which are the different methods available in VB for record set manipulation?

AddNew:For adding a blank record at the end of the recodset .An AddNew method followed byAn update method will create a new record in the Database
Data1.Recordset.Addnew

Delete:This method will delete the current record in the Database
Data1.Recordset.Delete

Update:This method modify the current record in the Database
Data1.Recordset.Update

Unit test

1. Design a VB application to read phone number ,name and address and do the following tasks(2)
   a. Add new record
   b. Edit a record
   Delete a record
2 Which are the Find methods in VB used to locate the records of a record set (2)
3 Arun wants to make changes in the current record in a data base. Which method of record set property can be used (1)

4 Anitha wants to create an access style database using VB. Explain the different steps involved (4)

5 Text1.Text = Data1.Recordset.fields ("name")

a. Which property of data control should be set to access the table 'stud' from the database "mydb.mdb"

b. Explain the different record set types available in VB (3)

6 Karim designed an user interface with a data control and some text boxes in order to display the records of a table . which property of text box can be used to connect to the data control(1)

7 Rita wants design a data base using VB. Which add ins tool can be used for this purpose(1)

8 Yousuf is developing an airline reservation system in VB. A form is designed by him for inputting flight number, flight description, and designation. A data control is used in this form. Write the record set Object methods and controls required to(2)

i. Add a new record

ii. Delete a new Record

9 Raju wants to connect a data control with a database stored in secondary memory while developing a library management project in VB. List the essential properties of the data control he has tol make use for this with their respective uses. Also write what is a dynaset (3)

10 ……..…… Cannot be a data bound control(1)
textbox, combo box, List Box , command button.

Chapter 6

INTRODUCTION TO HTML

World wide web (www)- is service provided by the internet . In web, documents are presented in the form of web pages. Hyper Text Markup Language(HTML) is the language used for web page creation. Using HTML we can write hypertext documents. hypertext documents are documents having hyper links to related section. Link can be activated by mouse click.

HTML is Developed by TimBerners-Lee in 1980

HTML standards are controlled by World wide web Consortium(W3C) founded in 1994.

HTML pages can be created in any text editor (e.g.: Notepad).Save the file with extention '.htm' or '.html '. HTML pages are viewed with the help of software called web browser (e.g.: Internet Explorer, Firefox, Google Chrome etc.)

- HTML defines a set of commands for creation of Hypertext documents.
- HTML commands are coded in the form of tags.
- Tags are the keywords used to define the HTML document.
- Each Tag has a name. It is enclosed between '<'and '>' symbols.

E.g.: < P > - tag used to form a paragraph.

- Tags are not case sensitive (Hence tag name can be typed in upper case or lower case).
- Tags are classified into two.

(i)Container tag	(ii)Empty tag
➢ Applicable for a section. ➢ Starting and ending tags. ➢ Starting at the beginning of the section. ➢ Ending tag at the end of the section. Giving'/' symbol before the tag name E.g.:<P>and</P>forms paragraph tags.	➢ Do not span over a section. ➢ No ending tags. E.g.: -for line break.

Attributes are parameters for providing additional information within a tag.
E.g.: < P align= “right “>Right aligned paragraph < /P >
Here align is the attribute, ‘right is the value.

Structure Tags:- Tags used to define the general document sections.

<HTML>

The <HTML> indicates the document follows HTML format. It is container tag. The attribute DIR is used to indicate document direction(i.e. ,language read from left to right or right to left) ‘ltr’-left to right ‘rtl’-right to left

<HEAD>

The <HEAD> defines the head section. It includes title, general Style, definition, script programs etc. It is a container tag.

< TITLE>

It encloses the title of the document. It gives in head section. The title is displayed in title bar of the browser window. It is a container tag.

<BODY>

The document body is defined with in <BODY> and </BODY>.It forms the content displayed in the browser window.

Eg:

```
<HTML>
  <HEAD>
    < TITLE> KASARAGOD DISTRICT  < /TITLE>
  </HEAD>
    <BODY>
      WELCOME TO KASARAGOD
  </BODY>
</HTML>
```

Attributes of <BODY > Tag:

Attribute	Purpose	values
BGCOLOR	To set the background color for the document body	Color name or RGB value
BACKGROUND	To set an image as background of the document body	Image file name with path

TEXT	Specifies the color of the text content of the page	Color name or RGB value
LINK	Specifies the color of the hyper link that are not visited	Color name or RGB value Default value is Blue
ALINK	Specifies the color of the active hyper link	Color name or RGB value Default value is Green
VLINK	Specifies the color of the hyper link ,which Are already visited	Color name or RGB value Default value is Red
LEFTMARGIN	To set margin from left	Number of pixels
TOPMARGIN	To set margin from top	Number of pixels

- **Color value** can be specified in two ways

  1. Color name:- Standard color name can be directly specifies as the attribute value

  E.g.: < BODY BGCOLOR= "Green ">

  2. **RGB Code: -** Color is a combination of primary colors – Red, Green, Blue component values corresponding to it. Each component is two digit Hexadecimal code.

E.g.:- < BODY BGCOLOR = "#808080" BACKGROUND = "school.jpeg" TEXT= "RED" LINK = "YELLOW" ALINK="#FF00FF" VLINK ="#808000" LEFTMARGIN =100 TOPMARGIN = 150 >

Eg: The following HTML code is to display a web page with a background picture and sets left margin and top margin.

```
<HTML>
  <HEAD>
    <TITLE> Attributes of body tag</TITLE>
  </HTML>
  <BODY background="school.jpg " leftmargin=100 topmargin=50>
    A page with background image and margins <BR>
    The left margin is 100 and top margin is 50.
  </BODY>
</HTML>
```

Text Formatting Tags:-

Tag	Purpose	Attribute	Use of attribute	Values
< P >	For Paragraph separation It is a container tag	Align	Paragraph alignment	Left, Right and Center, Left is the default value
< CENTER >	Centralizing the content enclosed. It is a container tag	--	---	----
< BR >	Used as line break It is Empty tag	---	----	-----
< HR >	To draw a horizontal line It is empty tag	Size	Specifies the line thickness	No of pixels
		Width	Determines line length	No of pixels or Percentage of total window width
		No Shade	NO shade is to be given for the line.	
Heading Tags < H1 > to <H2>	Headings can be given in 6 levels. Size reduces from < H1 > to <H2> It is a container tag	-----	-----	-----
< B >	Displays the content enclosed in **Bold face.** It is a container tag	-----	-----	-----
< I >	Displays the content enclosed in *Italics.* It is a container tag	-----	-----	-----
< U >	Displays the content enclosed in <u>Underlined</u>. It is a container tag	-----	-----	-----
< SUB >	Used for framing subscript It is a container tag	-----	-----	-----
< SUP >	Used for framing superscript It is a container tag	-----	-----	-----
<BASEFONT>	Sets the normal font for the document text. Font specified will be the default font. It is empty tag	size	Sets the font size	Number of pixels
		Face	Specifies the font name	Font name
		Color	Specifies the font color	Color name or RGB value

< FONT>	Defines the font characteristics of the text enclosed It is a container tag	size	Sets the font size	Number of pixels
		Face	Specifies the font name	Font name
		Color	Specifies the font color	Color name or RGB value

Eg:- The following HTML code is to display a web page with <P> , <CENTER>,
 and <HR> Tags.

```
<HTML>
  <HEAD>
    <TITLE> Examples for Paragraph, Center, BR and HR Tags</TITLE>
  </HEAD>
  <BODY>
    <CENTER> Paragraph Formatting </CENTER>
    <HR width=”50%”>
    <P Align=”left”> This is a sample page to demonstrate  Paragraph, Center, BR and
      HR Tags.<BR>
      This paragraph is left aligned , it is the default of align attribute.</P>
    <P Align=”right”> Paragraph can be right aligned. <BR>
                This is a right aligned paragraph.</P>
    <P Align=”center”> Paragraph can centralized also<BR>
       This is a centralized paragraph.</P>
  </BODY>
</HTML>
```

Eg :- HTML code to display in different Headings.

```
<HTML>
  <HEAD>
```

```
        <TITLE> Heading  Tags</TITLE>
      </HEAD>
      <BODY>
          <H1>COMPUTER APPLICATION</H1>
          <H2>COMPUTER APPLICATION</H2>
        <H3>COMPUTER APPLICATION</H3>
        <H4>COMPUTER APPLICATION</H4>
        <H5>COMPUTER APPLICATION</H5>
        <H6>COMPUTER APPLICATION</H6>
    </BODY>
</HTML>
```

Eg:- The following HTML code is to display a web page with <B> , <I>,<U> ,<SUB>, <SUP>, <BASEFONT> and <FONT> Tags.

```
<HTML>
    <HEAD>
        <TITLE> Example for B, I, U, SUB, SUP, BASEFONT and  FONT Tags.
</TITLE>
    </HEAD>
    <BODY>
      <BASEFONT  size=11 face="arial" color="#ff00ff">
      <B>This sentence is in bold style. </B>  <BR>
      <I> This sentence is in italic style. </I> <BR>
      <U> This sentence is Underlined. </U>  <BR>
    <!—To display H2 O, the HTML statement is -->
      H <SUB>2 </SUB>O    <BR>
    <!—To display A2 + B2   , the HTML statement is -->
      A<SUP>2</SUP>+B<SUP>2</SUP>  <BR>
```

```
<FONT face="Times New Roman" size=14 color= "#ffff00">
    This font is Times New Roman, size is 14 and color is yellow
</FONT>
</BODY>
</HTML>
```

Questions:

1. Write the tag used to create a line break in HTML.
2. With an appropriate example write difference between HEAD and TITLE tags.
3. The body section forms the content displayed in the browser window. Briefly explain any four attributes in the Body tag.
4. Name the software used to view web page.
5. The Dir attribute of <HTML> tag is used to indicate ……
6. Differentiate between container tag and empty.
7. Nitto wants to centralize the heading in an HTML page . Mention the tag he can choose
8. In HTML the RGB code Used to define blue color is ……
9. Write the HTML statement to get the following output.
   (i) **Commerce** (ii) *Humanities*

LINKING

< A > Tag or Anchor tag :-

< A > tag is used to provide **Hyperlinks**. It is also called **anchor tag.** It is a container tag . The link is created in the content enclosed in between the tags.

Attribute of < A > tag

Attribute	Purpose	values	Example
HREF	It specifies the hyper reference	The URL of the document to which the hyper link is provided	< A HREF ="C:\sample.htm "> Sample Pag < /A>
NAME	Specifies a name for a section of Document.		< A Name= "Top"> Introduction </A >

Email Link

Email link can be given using < A > tag. For this **mailto** protocol is used for the HREF attribute value.

Eg:- <A href= "mailto:school@gmail.com">Mail to school </A>

External and Internal Links

Hyperlinks are two types:

1.**External links**: Links given to another page.

Eg:- < A href ="c:\html\results.htm">Result </A>

2. **Internal links:** Linking a section of the same document.

For giving internal links

- The section to which the link is to be provided must given a name using name attribute.
- Specify the name of the section as value for href attribute of <A> tag.

Eg:- The following HTML code is to create an external link

```
<HTML>
  <HEAD>
    <TITLE> Hyperlinks </TITLE>
  </HEAD>
  <BODY>
    This is a sample HTML document to explain external linking. <BR>
    Click<A href = "next.htm">Next </A>  to go to next page.
  </BODY>
</HTML>
```

Save this file as **main.htm**

```
<HTML>
  <HEAD>
    <TITLE> Hyperlinks </TITLE>
```

```
</HEAD>
<BODY>
  This page is a sample page to test<BR>
  How the hyperlinks are working. <BR>
  Thank You.
</BODY>
</HTML>
```

Save this file as **next.htm**

< IMG > Tag

It is used for placing inline images in an html document. The image is displayed along with the text content. It is an empty tag.

Attributes of <IMG> tag

Attribute	Purpose	values
SRC	Specifies the URL of the image file	File name with path
ALIGN	Specifies the alignment of the image along with the text	Left-Places the image on left of the text
		Right- Places the image on right of the text
		Top-align the top edge of the image with the enclosing line
		Middle- align the middle of the image with base line of the text
		Bottom-aline the bottom of the image with line
HEIGHT	Specifies the height of the image display area.	Number of pixels.
WIDTH	Specifies the width of the image display area	Number of pixels
ALT	Specifies alternative text for the image. If the browser cannot load the picture, then the text given in the ALT attribute will be displayed.	

Hyperlinks can be provided on an image. FOR this place < IMG > tag in between
< A > and </A >
Eg: < A HREF = “school.htm” >< IMG SRC= “school.jpeg”> < A >

Comments

- Comments sections, which are not displayed in the browser window.
- It is given in between < !--- and ----> symbols.
- Comments are used to give explanatory notes in an html code.

Eg: <! ----- the following codes gives an inter link --- >

Special Characters

HTML defines symbolic codes to represent a set of special characters.

CODE	SYMBOL
&lt	‘ <’ symbol
&gt	‘ > ‘ symbol
&amp	‘ & ‘ symbol
	Non breaking space

LIST

There are three types of lists in HTML – Unordered , Ordered and Definition lists.

Unordered list: Unordered list arranges the list items with bullet symbol in front.

<UL> and </UL> tags encloses an unordered list. List items are specified by <LI> tag.

Type attribute of <UL> taor g specifies the bullet type. Values are square, circle or disc. The default value is disc.

Ordered List: In an ordered list, list items are numbered in sequence. Tags used are <OL> and </OL> . List items are given using <LI> tag.

Attributes of <OL> Tag

Attribute	Purpose	values
Type	Specifies the numbering type for the List items	1 for Arabic number
		i for lower case Roman letters
		I for upper case Roman letters
		a for lower case letters
		A for upper case letters
Start	Specifies the starting number for the list items	

Definition List:

It is formed by a group of definition and their definitions . <DL> and </DL> is used for definition list. The <DT> tag contains the definition term portion and <DD> tag specifies the description.

Eg:- Example for Unordered list, Ordered list and Definition list.

```
<HTML>
 <HEAD>
    <TITLE>:- Example for Unordered list, Ordered list and Definition list
</TITLE>
    </HEAD>
    <BODY>
      <!—code to create an unordered list, the HTML statements is -->
          This is an Unordered list <BR>
        <H5> Optional Subjects </H5>
          <UL type=”circle”>
        <LI>Business Studies
          <LI>Accountancy with CA
          <LI>Economics
          <LI>Computer Application
       </UL>
     <!—code to create an ordered list, the HTML statements is -->
          This is an Ordered list <BR>
        <H5> Optional Subjects </H5>
          <OL type=”i”>
           <LI>Business Studies
             <LI>Accountancy with CA
             <LI>Economics
             <LI>Computer Application
```

```
        </OL>
    <!—code to create a definition  list, the HTML statements is -->
            This is a Definition list <BR>
        <DL>
            <DT>HTML
                <DD> Hyper Text Markup Language
            <DT>DHTML
                <DD>Dynamic Hyper Text Markup Language
            <DT>XML
                <DD>Extensible Markup Language
        </DL>
    </BODY>
</HTML>
```

Questions:

1. Explain the different types of hyper links.
2. Write any three basic list types provided by HTML. Write their tags also
3. How to use list tags in a web page? Explain with example?
4. Suppose you want to place a picture in a web page which tag is used for this purpose? Mention its attributes.
5. HTML has the facility to provide External Links as well as Internal Links
   a) Which tag is used to include an External Link.
   b) How will you construct an internal link.
6. Write an HTML code for creating the following webpage

ABC PVT LTD, Hydrabad

1. health care
2. baby products
   a) toys
   b) Dress
3. mens wear
   · Casuals

· Formals

7. Which tag provide hyper links in HTML.

8. Varun is creating a web page. He wants to create a link on the text 'sample' to a file 'sample.html' which resides in a subdirectory named 'exam' of the D drive. Write the HTML command for this purpose.

9. Mention the Purpose of ALT attribute of <IMG> tag.
10. Renu is making different list structures in HTML Can you explain her the types of List She can Choose.
11. Classify the following
    Align, Frame, Href, Font

12. Suresh is designing a web page. He wants to display an image in the right side of the text . Write the HTML Code for it.

13.List and explain three attributes of <body> tag.

14.Categorise the following tags into Container tags and empty tags.
    <B>, <BR>, <A>
    <FRAME>, <FRAMESET>, <LI>
15. Specify any two attribute of HTML tag.

16.Write the HTML statement to get the following output.
(i) H_2SO_4 (ii) $a^2 + b^2$ (iii) **Computer**
17.Name the tag which has 'Noshade' attribute.

18. Salim developed a personal website, in which he has to create an e-mail link. Can you suggest the protocol used to achieve this task.

19. You want to connect your webpage to the web portal www.yahoo.com. Mention the tag that can be used for this.

20.Specify the main attribute of <IMG> tag used to include an image file in a web page.

21. Select the attribute associated with <IMG> tag from the following. (Name, size, Align, Value) (1 Score)

22. Write HTML code for creating the following webpage using lists tags.

Netlink Ltd.
Banglore
Our Products:
1. Television
2. Washing Machine
   - Model 2005 XP Series
   - Model 2006 ST Series

23. Write the HTML code for creating the following webpage using. Lists tags.

COMPUTER TERMS

CPU

Central Processing Unit

ALU

Arithmetic and Logic Unit

WWW

World Wide Web

Chapter 7

ADVANCED HTML

To create an attractive web page, we need some more tags. Here we discuss the HTML tags. Here we discuss the HTML tags for the creation of table, frame & form.

TABLE

In a document, tables provide a convenient method for ordered presentation of information. Tables arrange the content in the form of rows and columns. In a web page ,Text, image, Hyperlink etc. can be arranged as tables.

Tags used to create a table:

- <TABLE> ---- Forms the container for a table.
- < TR > ----- Specifies the row of a table.
- < TH > ------ Specifies the heading cells.
- < TD > ----- Specifies the normal data cells.

< TABLE > Tag :-

It is a container tag, which encloses the whole table. That is, other tags to form the table content are given in between < TABLE > and </ TABLE > .

Attribute of <TABLE> tag:

Attribute	Description	values
BORDER	Specifies the thickness of the border lines around the table cells	Number of pixels. Zero produces table with no border lines.
BORDERCOLOR	Specifies the color for border lines	Color name or RGB value
ALIGN	Specifies the table alignment in the window	Left, Right, Center Default align position is left
BGCOLOR	Specifies the background for the table Table cells are shown with bgcolor	Color name or RGB value
CELLSPACING	Specifies the space to be left between table cells	Number of pixels.
CELLPADDING	Specifies the space between the cell border and content	Number of pixels.
COLS	Specifies the number of columns in the table.	number

WIDTH	Specifies the table width	Pixels or in percentage of total window width
FRAME	Specifies the border lines around the table	Void- Gives no border lines for the table.
		Box-border line on all sides, it is the default value
		Border- same effect as box
		Above- border line only on the top edge of the table
		Below-- border line only on the bottom edge of the table
		Hsides- border line only on the horizontal sides
		Vsides- border line only on the vertical sides
		Lhs- border line only on the left edge
		Rhs- border line only on the right edge

< TR > Tag:- Table rows are defined by <TR> Tag. Each row cells are enclosed by the container tag pairs

<TR> and </ TR>.

Attribute of <TR> tag:

Attribute	Description	values
ALIGN	Specifies the horizontal alignment of the cell text in the row	Left, Right, Center or Justify. Left is the default value.
VALIGN	Specifies the vertical alignment of the cell content in the row.	Top, Middle, Bottom and Baseline
BG color	Used to set a background color for the row.	Color name or RGB code.

< TH > Tag:-

- < TH > tag defines the heading cells in the table.
- Content of the heading cells are given in between container tag pairs < TH >and </ TH >.
- Heading cells are displayed in **boldface and centered** .
- < TH > tag is given within the < TR > tag

< TD > Tag:-

- Enclose table data.
- It is a container Tag.
- < TD > tag is given within the < TR > tag.

Attribute of < TH > and < TD > tags:

Attribute	Description	values
ALIGN	Specifies the horizontal alignment of the content for the cell.	• Left, Right, Centre and justify. • For<TH> the default value is center. • For <TD> the default value is left.
VALIGN	Specifies the vertical alignment of the cell content.	Top, middle, bottom and baseline
BGCOLOR	Specifies the border color for the cell	Color name or RGB code
COLSPAN	Specifies the column span for the cell .It is used to stretch a cell over a number of columns.	Number Default value is 1 E.g.<TD colspan =3>
ROWSPAN	Specifies the number of rows to be spanned by the cell. A cell can be spanned over multiple rows by settings the ROWSPAN value.	Default value is 1 <TD rowspan=2>

Eg: Write the HTML code for creating the Following Table

Bank Table		
Type and Number of Accounts	Savings	1500
	Current	1000
	Fixed	1200

Code:

```
<HTML>
  <HEAD>
    <TITLE>:- Example for Table</TITLE>
  </HEAD>
  <BODY>
    <TABLE border=2 cellspacing=3 cellpadding=4 width=60%>
      <TR>
```

```
            <TH colspan=3>Bank Table</TH>
        </TR>
    <TR>
            <TD rowspan=3>Type and Number of<BR>Accounts</TD>
            <TD>Savings</TD>
            <TD>1500</TD>
        </TR>
        <TR>
            <TD>Current</TD>
            <TD>1000</TD>
        </TR>
        <TR>
            <TD>Fixed </TD>
            <TD>1200</TD>
        </TR>
  </BODY>
</HTML>
```

Questions:

1. The default align value for a table is ---------- .
2. -------- tag encloses the heading cells in a table.
3. The default align value for a <TH> tag is ---------- .
4. The border lines around a table is specified by -------- attributes.

Frameset: - The Frameset divides the browser window into a number of sections. So that different web pages can be loaded in each section. The individual section of a frameset window is known as frame. <Frameset> Tag and <Frame> tag are the main tags needed for creation of a frameset page.

The <Frameset> tag defines frame sections and the <Frame> tag specifies the pages to be loaded in each frame.

No < BODY > section is needed for a frameset page

< FRAMESET > Tag :- It is container tag for defining a frameset.

Attributes of < Frameset > Tag

Attribute	Description	values
COLS	Determines the dimension of vertical frames in the frameset page.	Number of pixels or in the percentage of total window width. '*' symbol is used to represent variable width.
ROWS	Defines dimension for horizontal frames.	Number of pixels or in the percentage of total window height. '*' symbol is used to represent variable height.
BORDER	Specifies the thickness of border for the frames	Given in Pixels
BORDERCOLOR	Specifies the color for the frame.	Color name or RGB code.

< FRAME > Tag:- The < FRAME > Tag defines the frames with in frameset. Frame tags are given corresponding to each frame section of the frame set window . It is an empty tag.

A frame section can be divided again by another < FRAMESET > Tag given with in it.

Attributes of < FRAME > Tag:-

Attribute	Description	values
SRC	Specifies the URL of document to be loaded in the frame.	File name with path Eg:- < FRAME SRC = "main.htm" >
SCROLLING	Indicates whether scroll bar is to be shown in the frame, when the content exceeds frame size.	Yes, No or Auto
NORESIZE	Prohibits the resizing of the frame.	No value is to be assigned
MARGINWIDTH	Sets the horizontal margins	Number of Pixels

MARGINHEIGHT	Sets the vertical margins	Number of Pixels
NAME	Gives a name for the frame. It is useful to load a document to the frame from other sections.	
TARGET	Specifies the target for hyper links in the frame, The linked page will be loaded in the frame	

< NOFRAMES > Tag:

There are browsers that do not support frameset. The container tag <NOFRAMES > which displays alternative text, if the browser cannot load the frame.

Eg:- Create an HTML frame that divides the page in the ratio 10:90 horizontally. The first frame shows a welcome message and the second page displays the details of your school

Code:

```
<HTML>
    <HEAD>
        <TITLE> Example for Welcome Page</TITLE>
    </HEAD>
    <BODY>
        <h2>WELCOME TO OUR SCHOOL</h2>
    </BODY>
</HTML>
```

Save this Page as 'welcome.htm'

```
<HTML>
    <HEAD>
        <TITLE>Details of My School</TITLE>
    </HEAD>
    <BODY>
```

```
            Write few sentences about your school
        </BODY>
    </HTML>
```

Save this Page as 'school.htm'

```
    <HTML>
        <HEAD>
            <TITLE>Frameset Page</TITLE>
        </HEAD>
        <FRAMESET cols="10%,*">
            <FRAME SRC="welcome.htm">
            <FRAME SRC="school.htm">
        </FRAMESET >
    </HTML>
```

Questions:

1. --------- divides the browser window in to different sections.
2. ---------- tag specifies the content to be displayed in a browser that doesn't support Frameset.
3. Name the attributes of <Frameset> tag.

FORMS

Forms provide a way for passing information from web page viewers to web server. These pages accepts data from the users and pass it to the server side.

Eg:- Online application forms, Order forms, feedback forms etc

Form Page contains standard input controls – Text box, Check box, Radio button, Select box, Text area etc.

It includes methods for passing information to the server.

< FORM > Tag :

- It is used to create a form
- It is a container tag
- Its Main attributes are Action and Method.

< INPUT > Tag :

< INPUT > tag is used to create different input controls such as Text box, Password box, Check box, Radio button, Submit button, Reset button etc.

It is an empty tag.

Attributes of < INPUT > Tag :-

Attribute	Description	values	Effects
Type	Determines the control type created by the tag	Text	Creates a Text box. <input type=”text”>
		Password	Creates a password box < input type=”password”>
		Checkbox	Create check boxes < input type=”password”>
		Radio	Creates a radio button < input type=”radio”>
		Reset	Creates a reset button < input type=”reset”>
		submit	Creates a submit button < input type=”submit”>
Name	To give a name for the input controls. The data value is passed along with the name to the server.		
Value	Sets the default value for the input control.		
Size	Specifies the size of input control It is applicable only when the input type is text or password		
ID			

To group radio buttons, the input tags for the button are given same name and the data represented by each button is indicated by the value attribute.
Eg:- < INPUT type= “radio” name= “sex” value= “Male”>
< INPUT type= “radio” name= “sex” value= “Female”>

< TEXTAREA > Tag:-

- < TEXTAREA > Tag is used to create a text area control
- It is a control that allows multiple line text input.

Attributes< TEXTAREA > Tag

Attribute	Description	values
Name	Gives a name for the control	
Cols	Specifies the width of the control	Number of character
Rows	Specifies the height of the textarea control	Number of lines

Eg:- < TEXTAREA name= "CAddress" Cols=5 Rows = 5> Type the address< /TEXTAREA >

SELECT BOX

- It provides a selection list from which the input option can be selected.
- Clicking on the box, the list of inputs will be opened from which the needed item can be selected.
- <SELECT> and <OPTION> are the tags needed to create a select box.

<SELECT> Tag :-

<SELECT> and </SELECT> encloses a select box. It is a container tag.

Attributes of <SELECT> Tag :

Attribute	Description
Name	Specifies a name for the content
Size	Specifies the number of items in the select box.

<OPTION> Tag :

Each select option is given by <OPTION> tag placed within the <SELECT> tag pair.

Attributes of <OPTION> Tag :

Attribute	Description
Selected	Sets the option as default item

Eg:-

< SELECT >

< OPTION > Football

< OPTION selected > Cricket

< OPTION > Hockey

< /SELECT >

< LABEL > tag :

- It provides a label for the form control
- Label is shown near the control in order to indicate the expected input.

Attribute of < LABEL > Tag

Attribute	Description
For	It connects the label with the input control < INPUT > control's ID attribute value and the <LABEL > control's for attribute values are same.

Eg: Prepare an application form to accept your bio-data using HTML. Details such as Name, Address, Nationality, Hobbies etc should be entered.

```
<HTML>
  <HEAD>
    <TITLE>Bio Data Form</TITLE>
  </HEAD>
  <BODY>
    <h3> BIO DATA</h3>
    <FORM>
      <LABEL for="idname">Name </LABEL>
      <INPUT Type="text" Name="sname" id="idname"><BR>
        <LABEL for="idmale">Male </LABEL>
        <INPUT Type="radio" Name="sex" value="Male" id="idmale">
            
```

```
                <LABEL for="idfemale">Female </LABEL>

                <INPUT Type="radio" Name="sex" value="Female"
id="idfemale"><BR>

                <LABEL for="idadd">Address;  </LABEL> <BR>

                <TEXTAREA Name="address"  cols=20 rows=5  id="idadd">Your
address

            </TEXTAREA><BR>

                <LABEL for="idhobbies">HOBBIES </LABEL>

                <INPUT Type="checkbox"  name=" Reading" id="idhobbies">

                <INPUT Type="checkbox"  name= "Cricket Playing"  id="idhobbies">

                <INPUT Type="checkbox"  name= "Gardening"  id="idhobbies">

          </FORM>

       </BODY>

    </HTML>
```

Form Submission

When the viewer clicks the submit button, data entered in the form will be passed to the server. When the data reached the server, special server side programs are provided for processing data.

The URL of the server side program to process the form data is specified by the action attribute of <FORM > tag.

The **Method** attribute of the < FORM > tag determines the method of submission of the form data to the sever.

GET *and* ***POST*** *are the two form submission methods.*

Get method attaches the form data to URL specified by **Action** attribute and sends it to the server. The *Name* and *Value* pairs corresponding to form elements are given after the '?' symbol. Each data item is separated by '&' symbol.

Eg:- http://www.scert.org/asp/process.asp ?

sname=Abhilash & sex= Male &

In **Post** method, data is stored separately and is forwarded to the URL specified in the action attribute.

Difference between post and get method:

GET	POST
Used to pass less volume of Data	Used to pass large volume of data
It is faster	More secure, because the data entered Is not visible during submission.

Questions:

1. Suggest an alternative for a browser which donot support frameset tag.
2. Vinu wants to change the thickness of the border line of a table in his web page. Which attribute of <table> tag can be used for this.

3. Name the tag to which the attribute Frame is associated.

4. The option attribute is associated with ——— tag.

5. Consider the following <FRAMESET Cols = "50%,*"> What will be the output of the above HTML statements?

6.. In a webpage, user needs to enter the address of persons. Name the tag used for this. List and explain any two main attributes of it.

7. Name the tag which permits a user to add more than one webpage in a simple window. List any two attributes of it with explanation.

8. In HTML, Form tag can accept user inputs and communicate it to a server program (2)
   a) Write the general format of form tag
   b) How will you construct a "submit' button and a reset button with in form tag

9. find out the output of the following HTML statements and describe the tags used

```
<html> <body>
 <table border =2>
  <tr>
    <td colspan=2> college </td>
  </tr>
  <tr>
  <td rowspan=3> departments</td>
  <td> department1</td></tr>
  <tr><td> department2</td></tr>
  <tr><td> department3</td></tr> </table></body></html> (4)
```

10. Shabeer wants to divide the browser window into two sections. Which tag in HTML is useful for this.

11. In VB, a programmer can use option button, text box, combo box etc. to accept inputs from the user. But in HTML <INPUT> tag is used for creating all the above controls. Which attributes of the <INPUT> tag is used for this. List and explain the possible values of it.
12. Athul is creating a webpage. Write a HTML code to divide the window horizontally in the ratio 40: 60

13. Write an HTML code to create a select box with three list options Low, Medium and High with medium as default item.

14. Write a tag to create a form with a textbox and a submit button.

15. Midhun wants to create a web page for passing information from the user to the web server. Name the HTML section which provides this facility.

16. Write an HTML code to create a form with controls to accept the reg no of the students and to submit it.

17. Mention the use of Noframe Tag in HTML.

18. Differentiate between <table> and <frame> in HTML

19. Compare Get and post values of method attribute of <form> tag.

20. Write a simple HTML program for displaying a select box with the following items male & Female . How do you mark one of the items in the select list as default selection item

21. Aji wants to create a form in HTML to do the following
    a) Input Name using text Box
    b) Two Radio Button to select Male Or Female
    c) Input Address
    d) Submit button with caption ok

22. Consider the following HTML statements.

```
<TABLE>
  <TR>
    <TH> Mark </TH>
    <TD> 90 </TD>
  </TR>
</TABLE>
```

What is the difference between the content displayed in the cells of the table?

23. write the HTML code for creating the Following Table.

XYZ Pvt LTD		
Price List		
Item	**Price**	**Quantity**

Soap	15	10
Book	23	12
Pen	10	14

7. Write the HTML code to create the following table
   Science

Subject		**Mark**
Science	Physics	40
	Chemistry	35
	Biology	48

Chapter 8

ADVANCED TOOLS FOR WEBDESIGN

As you know, HTML allows the user only to view the web page. We cannot make it interactive or dynamic. To make it active , we can use the advanced web tools like DHTML, XML, VB Script, Java Script, ASP, JSP etc.

DYNAMIC HYPERTEXT MARKUP LANGUAGE (DHTML)

- DHTML does not introduce any new tag.
- It makes the existing tags programmable by using scripting languages like VB Script and Java Script.
- It includes animation and multimedia controls.
- Data awareness is an important feature of DHTML (The data entered by the user can be saved in a database at the server side.

EXTENSIBLE MARKUP LANGUAGE (XML)

- XML allows to define new tags. This new tags can be used as any other HTML tag
- It is a way of bringing data from the server side to the client side.

SCRIPTING LANGUAGES

Scripts: Scripts are simple programs embedded in the HTML page . The < SCRIPT> and </SCRIPT> are used to enclose the scripts in HTML page. It executes when users view a web page.

It performs the following functions

- Controlling the navigation in the web page based on some conditions.
- Handling responses from the viewers and validating the user inputs
- Check which browser is running
- Communicates to the user
- Querying database and displaying results.
- Collecting and storing user information.

Scripts are two types- **Client scripts** and **Server scripts** . Scripts that can be executed by the browser are called **Client scripts.** Scripts executed by the server are called **Server scripts.**

The Language used to write scripts are known as **Scripting Languages**.

E.g.: VB Scripts, Java Scripts and Microsoft J Scripts etc.

We can use different scripting languages on the same page

Java Script is an object based platform independent scripting language. It is developed by Netscape. Java script runs on both Client side and Server side.

VB Script is a lightweight version of Microsoft Visual Basic. It is developed by Microsoft.

- VB Scripts are simple.
- It is not platform independent.
- It provides greater programming flexibility for client and server- side web applications.

Common Gateway Interface (CGI)

CGI is the standard for gateway programs to interface with HTTP servers or IIS . CGI is neither a program nor a programming language.

- It is a collection of protocols (Rules)
- It is a method by which a web server can obtain data from (or send data to) database , documents and other programs and present the data to users via the web.

Practical Extraction and Report Language (PERL)

It is the most common language used for CGI Scripts. Developed by Larry Wall.

It has portability to many different platforms such as MS-DOS and Windows NT.

Active Server Pages (ASP)

An ASP file contains Text, HTML Tags and scripts. An ASP file uses '.asp' extension.

VB script and Java script are used as script component of an ASP file. In the case of ASP, the script component execute in the server and the effect(result) send back to the client machine

Advantages of ASP

- ASP code is written in text mode.
- It does not need any server side installation for the execution of ASP code component.

- An ASP component can be modified without affecting the server function
- ASP applications are very small.

Java Server Pages (JSP)

JSP is a technology introduced by Sun Micro Systems. It helps web designers to easily develop and maintain dynamic web pages. It provides web based applications that are platform independent. JSP uses '. JSP' file extension.

Servelets are modules of Java code that run in server machine to serve the client requests.

JAVA

Java is an object oriented programming language developed by Sun Micro Systems. It helps to write powerful programs that run in the browser, desktop, Server or on a consumer device.

Java is a **platform independent** language . **Platform independence** is the ability of the same program to run on different operating systems.

Java program is created as a text file with extension '.java'. It is compiled into files byte codes with extension '.class'.

Byte codes are set of instructions similar to machine code instructions created when a computer program is compiled. The difference is that machine code run on the computer system it was compiled for and byte code can run on any computer system with an interpreter to handle java programs.

Java programs are interpreted by **Java Virtual Machine** (JVM). Any computer system with JVM installed can run a java program regardless of operating system in which the program was originally developed.

An **applet** is a java program that executes from a webpage.

.NET

It is a technology used to develop distributed applications. For this programmer can use any programming language. Distributed computing takes place in network environment. Here the processing takes place whenever the processor is free in the network. It is platform independent.

C# (C Sharp)

It is an object oriented programming language used for developing .NET applications.

Using C# we can develop powerful applications. Using C# we can enhance our ability to program web applications.

Questions:

1. --------- are programs embedded in HTML pages.

   a) Scripts b) IIS c) HTML d) HTTP

2. ---------- is the most common language for writing CGI scripts.

   a) UNIX b) PERL c) XML d) C#

3. Java programs that executes from a web page is called --------.

   a) Servlet b) Source code c) Byte code d) applet

4. What is the importance of .NET technology?

5. Explain the features of ASP and their advantages.

6. Pallavi wrote a program using JAVA. Which program helps her to run it?

7. Write short notes on the following. a) ASP b) C#

8. Scripts are simple programs embedded in the HTML page making the web page

Dynamic.

a) Name any two scripting languages

b) Distinguish between server script and Client script

9 Write shot notes on the following a) JAVA b) PERL

10. The higher secondary Examination results of your school is available on a web site. On entering the reg No the result of a particular student is displayed on the web page. Write any two technologies in addition to HTML, required to implement this web site.
11. Anwar is designing a web page . he decided to add some script in his HTML page. Is there any advantage in adding so? If yes what are the advantage.
12. Compare the features of DHTML and XML
13. Explain the features of any one of the scripting languages
14. Mention the Advantage of JVM
15. Name the language Which is commonly used for developing .NET applications
16. Expand the Following . ASP, JVM, HTML, CGI
17. Java is a platform Independent language Justify.
18. Write any three uses of client side scripting on a web page.
19. Which of the following may be considered as a dynamic page?
    (a) Page with an image.
    (b) Page with a hyperlink.
    (c) Page with a background colour
    (d) Response page for a google search
20. Name a .Net language which is used in web programming.
21. Raju is trying to order a digital camera through an e-commerce site. In the order form, on selecting the product name, corresponding product code is automatically filled up. Name the advanced web tool to implement this facility. Write its characteristics.

22. Akhil is trying to create an e-mail id through a web portal. On selecting the country, the names of states of the corresponding country gets filled up against the state List box.
    (a) Name the technology behind this.
    (b) Mention its characteristics.

23. The Higher Secondary examination result of your school is available on your school website. On entering the Reg. No., the result of that particular student is displayed as a webpage. Discuss any two technologies in addition to HTML, required to implement this website.

Chapter 10

Concepts of DBMS

We have already studied what is a database and how to create a database in MS Access. Also we know that database systems are designed to manage large quantities of information.

Conventional file management system

- Same data tends to repeat in many fields. It wastes storage space.
- Repetition of same data in many fields causes inconsistency.
- Sharing of data is not possible.
- We can not keep applicable standards in the representation of data.
- Security is not guaranteed.

Advantages of Data Base Management System

1. Redundancy can be avoided
   Duplication of data is known as redundancy. Database system do not maintain separate copies of the same data. All the data is kept in one place. So redundancy can be avoided and hence avoid wastage of storage space.

2. Inconsistency can be avoided
   When data redundancy is avoided (same data is stored only one place) inconsistency cannot occur

3. Data can be shared
   Data stored in a database can be shared among several users and programs

4. Standards can be enforced
   The centralized control of the database ensure that all the necessary standards observed in the representation of data

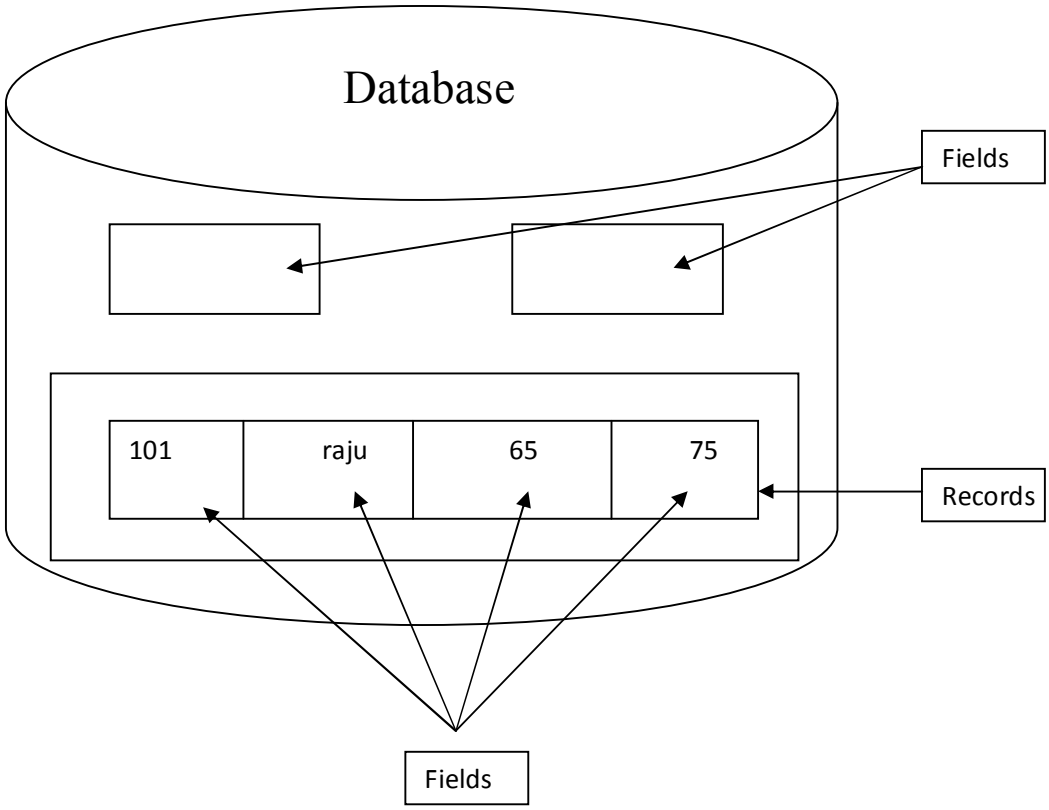
5. Security restrictions can be applied
   Security means protection of data. Different programs and users may share the data in common. But in DBMS access to specific information can be limited to selected users through passwords.

6. Integrity can be modified
   The database management system defines integrity checks such as rage check or value check.

Range checks ensure that data must be within a certain range and value check matches for values that must be present already. So integrity can be maintained

Structure of DBMS

1. **Fields** – The Smallest unit of stored data
2. **Records** – The Collection of related fields
3. **File** – The Collection of all Single type record



Component of DBMS

1. **Database** – The Collection of information in a structured manner
2. **Data definition language** -used to define structure of a table
3. **Data manipulation language**- used to add ,retrieve ,modify and delete records in a database

4 **Users** – Users interact with database using programs.

Questions

1 If ------controled, DBMS can ensure that database is never inconsistent
(Redundancy)
2 Name two types of integrity check
(Range check, Value check)
3 Which component of data base interact with the database
(DML)

4 Convince the employees of a bank why computerization is needed in their bank explaining the advantages of Database management system?
(Refer advantages of DBMS)
5 What do you mean by data redundancy?

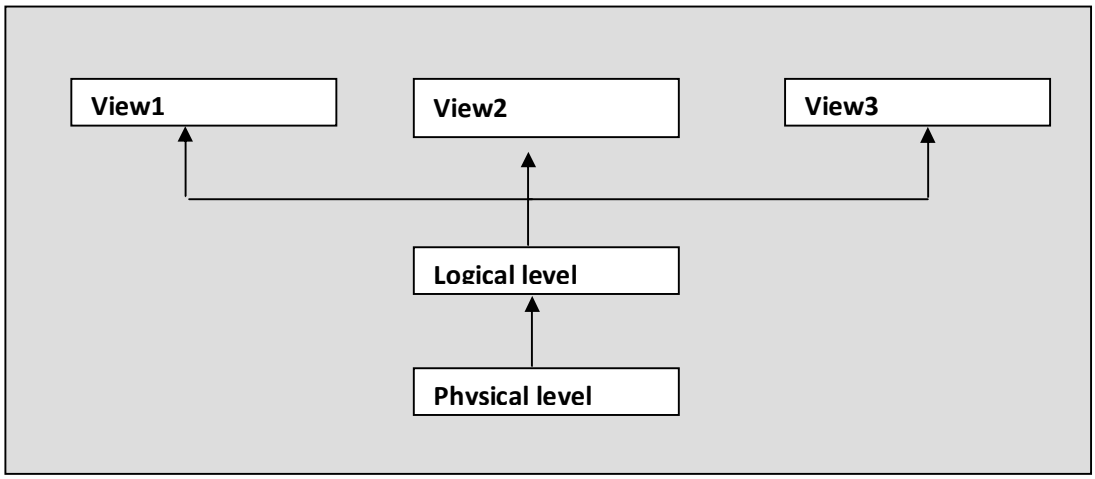
LEVELS OF DATABASE ABSTRACTION

DATABASE ABSTRACTION means **hiding** certain details of how the data is stored and maintained

There are **three** levels of Abstraction

- **Physical level**: Describes how the data is actually stored in the storage medium. This is the lowest level. This details are hiden from the programmer.

- **Logical level**: Describes what data is stored in the database and what relationship exists among this data. It is the next higher level.
- **View level**:This is the closest to the users. It is concerned with the way in which the individual user view the data



Data independence

It is the Ability to modify the schema of definition in one level without affecting the schema of definition at the next higher level.

Physical data independence
Ability to modify the physical schema without causing the application programs (change in the physical level does not affect the next level)

Logical data independence
Ability to modify the logical schema without affecting View level (View level has no changes even if the changes are made in the structure of the data

USERS OF A DATA BASE

Data base administrator
Person who has a central control over DBMS
Application programmer
A computer professional who interacts with DBMS through programs
NAÏVE user
The end user who does not know details of the DBMS

Data Models
They are the Collection of tools for describing the data ,data relationship,data semantics and consistency problems.

There are three data models

- **Hierarchical model**: Assigns records to different levels of higherarchy. Lower level record is child and higher level record is parent(top of the database).This top level record is known as **root record**
  Disadvantage –Data redundancy
- **Network model :**It is Similar to Hierarchical model but each child record can have more than one parent record. Redundancy is reduced in this model
- **Relational model** :This is composed of one or more **tables**. Data is stored in different tables made up of rows and columns.tables are called ***relations***
  It reduces redundancy and complexity

Questions

1. Any record other than ----record is connected to superior record
   (Parent) Root record
2. Among the three models which model is used for in business transaction?Why?
   Relational data model
   It is composed of one or more tables .

Advantages are

- ❖ Redundancy can be reduced
- ❖ Since it is based on Mathematical operations,It Offers flexibility,Easy for updating the data
- ❖ Reduce complexity

4. "Iam a data model.My records can have more than one parentrecord"Who am I?
   Network model
5. Why logical data independence is more difficult to achieve than physical data independence?
   This is because Application programs are heavily depended on the logical structure of data they access.
6. Define data abstraction?Explainthree levels of dataabstraction?

DATABASE ABSTRACTION means **hiding** certain details of how the data is stored and maintained

There are **three** levels of Abstraction

- **Physical level**:Describes how the data is actually stored in the storage medium.Itis the lowest level.This details are hide from the programmer
- **Logical level**: Describes what data is stored in the database and what relationship exist among this data.It is the next higher level.
- **View level**:This is the closest to the users.It is concerned with the way in which theindividual users view the data

Try Your Self

1.The smallest unit of stored data in a data base is …
2.Discuss the various levels of abstraction which can be used in ATM Procedure
3.Match the following with the levels of abstraction to which the users are primarily associated

Level of absraction	User
Physical level	Naïve user
Logical level	Data base administrator
View level	Application programmer

4. A data model provides a way to represent data and their relationships
   A) Which data model assign data records to different levels of hierarchy
   B) Briefly explain the relational data model

A) Hierarchical model: Assigns records to different levels of higherarchy. Lower level record is child and higher level record is parent(top of the database).This top level record is known as **root record**

B) **Relational model**: This is composed of one or more **tables**. Data is stored in different tables made up of rows and columns. Tables are called ***relations***
It reduces redundancy and complexity

5. Name the person who has central control over the data base and programs in DBMS Data base administrator

6. Duplication of data is called
(Data edundancy)

7. Explain the components of DBMS
   1. **Database** – Collection of information in a structured manner
   2. **Data definition language** -used to define a structure of table
   3. **Data manipulation language**- used to add ,retrieve ,modify and delete records in a database
   4 **Users** –With the help of programs users interact with database

8. Which level of data abstraction is closest to the user
(View Level)

Unit Test

1 Which component of the DBMS provide interfaces with programming language? (1)

2 The programmers are connected with……level of abstraction (1)

3 Name the language that is used to define a database schema? (1)

4 Explain How data are organised in a database? (2)

5 Meera checked her account Details using ATM (3)

a) Identify the level of abstraction associated with this

b) Which are the other two levels?

6 Explain Data Independence (3)

7 Describe the advantages of DBMS (5)

8 consider the data base of online ticket reservation. Explain the classification of the users of this database (2)

9 Explain the different Data models (2)

Chapter 11

Relational Database Management System

Relational model data base management system represent the data base as collection of **relations(tables)**

Terms in RDBMS

- **Relation** :It is the mathematical term for a table
- **Domain:** A set of values in which the values in a given column are drawn.
- **Tuple**:The rows in relation. It represent a particular entity.
- **Attributes:** The column in a relation is called an attribute
- **Cardinality**: The number of rows in a table
- **Degree**: The number of attributes
- **VIEWS:** A view is a **virtual table** which does not really exist, but it is derived from a set of one or more base tables. It can be used just like another table. It can be queried ,inserted into, updated and deleted from.

Advantage of view: A way to access some but not all information in the table.

Key : used to identify or distinguish a tuple in a relation

There are different keys

- **Candidate key**
  A set of attributes that uniquely identify a row
- **Primary key**
  A set of one or more attributes that uniquely identify a row tuples within relation
- **Alternate key** :
  A candidate key other than primary key
- **Super key:**
  A combination of primary key with any other attributes
- **Foreign key** :
  Non key attribute of a table which is primary key of some other table.

Consider the following example

ADMNO	ROLLNO	YEAR	NAME	BATCH	DISTRICT
1001	1	2002	UTHARA	COMMERCE	D01
1002	2	2002	AMAL	COMMERCE	DO1
1003	1	2003	MARIYA	SCIENCE	D02
1004	1	2003	PALLAVI	SCIENC	D04

DISTCODE	DISTRICT
DO1	KASARAGOD
D02	KANNUR
D03	KOZHIKODE

- Candidate key- ADMNO or YEAR+ROLLNO+BATCH
- Primary key: ADMNO
- Alternate key: YEAR+ROLLNO+BATCH(ADMNO IS TAKEN AS PRIMARY KEY)
- Super key: ADMNO+NAME
- Foreign key:DISTCODE

Relational algebra

Relational algebra is a collection of operations that is used to manipulate entire relations. It takes one or more relations as input and produce out put as also a relation.

I. Unary operations

Operate up on one relation

A)select operation : Used to select tuples in a relation that satisfy a selection condition .We can use the symbol σ(sigma) for select operation
Example

Emp no	empname	Department.	Designation	Salary
1	anu	sales	Manager	18000
2	minu	production	Supervisor	15000
3	chinnu	marketing	Manager	27000
4	ponnu	production	Manager	65000

$\sigma_{\text{Salary>47000}}$ **(Employee)**

Result

Emp no	empname	Department.	Designation	Salary
4	ponnu	production	Manager	65000

B. Project operation

It select certain columns from the table and discard the other columns
It is denoted by the symbol ∏ (Pie)

∏ **empname,salary (employee)**

Result

EMpname	**Salary**
anu	18000
minu	15000
uinu	27000
ponnu	65000

II. Binary operations(Operate on pair relations)

It operate upon two relations
The various binary operations are following.

1. Cartesian product operations

It returns a relation consisting of all possible combinations of tuples from two relations. It is denoted by "X"
Remark:

- Cardinality of new relation is the product of numbers of tuples of the two relations operated upon
- Degree is equal to the sum of the degrees of the two relations operated upon.

Example:

Student

Roll no	Student name
1	Ananthu
2	Krishnaveni
3	Kaveri

Instructor

Inst no	instname	Sub
1	Maria	Computer
2	Amal	English

Student X Instructer

Roll No	Student name	Inst no	Student name	Sub
1	Ananthu	1	Maria	Computer
1	Ananthu	2	Amal	English
2	Krishnaveni	1	Maria	Computer
2	Krishnaveni	2	Amal	English
3	Kaveri	1	Maria	Computer
3	Kaveri	2	Amal	English

2.Union Operations

It gives a relation consisting of all tuples appearing in either or both of the two specified relations. It is denoted by "U". Duplicate tuples are eliminated .Union operation take place between compatible relations (Number and type of the attributes in both of the relations should be same)

Science

Roll no	name	Total mark
101	Ajay	98
102	Vijay	75

Commerce

Roll no	name	Total mark
201	Sidhu	65
202	Rohith	85
203	Kripa	60

Science U Commerce

Roll no	name	Total mark
101	Ajay	98
102	Vijay	75
201	Sidhu	65
202	Rohith	85
203	Kripa	60

3 . Intersection

Returns a relation consisting of all tuples ***appearing both of the relation***. Symbols used is "∩".It take place between compatible relations

Consider the tables 'Oppana' and 'Groupsong'

Oppana

Name	Age
Sajini	17
Nisha	18
Aruna	16
Anu	17
Rakhi	16
Minu	16
Jasmin	17

Groupsong

Name	Age
Raju	17
Reghu	15
Arjun	16
minu	15
Aruna	16
Minu	16
ajay	17
Anu	17

Opana Group Song

Name	Age
Aruna	16
Anu	17
Minu	16

4 Set difference

It returns a relation consisting of all tuples appearing in first relation, but not in the second of two specified relations. Symbol used is " –"

Opana - group song

Raju	17
Reghu	15
Arjun	16

Questions and answers

1. Which are the different keys in RDBS

Candidate key

A set of attributes that uniquely identify a row

Primary key

A set of one or more attributes that uniquely identify a row tuples within relation

Alternate key

A candidate key other than primary key

Super key

A combination of primary key with any other attributes

Foreign key

: Non key attribute of a table which is primary key of some other table.

2. Match the following

Relation	Field
Tuple	Table
Attribute	Record

3 .Name the table that does not contain data of its own, but derived from the base table

View

4 . Consider the following table

no	name	mark
1001	Anu	60
1002	ammu	70
1003	minu	80
1004	Mithu	90
1005	Chakki	50

What are the cardinality and degree of the above table

5. Consider the following table name **student** and write the relational operations for the following

‘

Reg No	Name	Mark1	Mark 2	Total
101	ABC	18	36	54
102	XYZ	45	48	93
103	ZYX	38	46	84
104	BCD	45	46	91
105	DEF	32	41	73

A To display the tuples from student relation where total is greater than 90

B To display only Reg No and

6. Can you find any alternate key in the following table? Justify your answer

Reg No	Roll No	Year	Name
101	1	2011	Rekha
102	2	2001	Revathy
103	3	2003	Fathima
104	1	2001	Shyma
105	2	2011	Rekha

7. Explain the different relational operations in RDBMS

Select operation : Used to select tuples in a relation that satisfy a selection condition
We can use the symbol ----- for select operation
Example

Union Operations

It gives a relation consisting of all tuples appearing in either or both of the two specified relations. It is denoted by “U”. Duplicate tuples are eliminated .Union operation take place between compatible relations(Number and type of the attributes in both of the relations should be same)

Cartesian product operations

It returns a relation consisting of all possible combinations of tuples from two relations. It is denoted by “X”
Remark: Cardinality of new relation is the product of numbers of tuples of the two relations operated upon
Degree is equal to the sum of the degrees of the two relations operated upon.

Union Operations

It gives a relation consisting of all tuples appearing in either or both of the two specified relations. It is denoted by “U”. Duplicate tuples are eliminated .Union operation take place between compatible relations(Number and type of the attributes in both of the relations should be same)

Intersection Operations

Returns a relation consisting of all tuples ***appearing both of the relation***. Symbols used is " ".It take place between compatible relations

Set difference

It returns a relation consisting of all tuples appearing in first relation, but not in the second of two specified relations. Symbol used is -----

---

Unit Test

1	Give an example for RDBMS package	1
2	Consider a table with fields Name,Roll no,Dob,Mark, Suggest a field among them which is suitable for a primary key. Justify your answer	3
3	Give a short note on views	3
4	Name the key that act as a candidate key but not a primary key	1
5	Name the relational operation which selects certain columns from the table while discarding others	1
6	State true or false Primary key cannot be a composite key Only certain candidate key can become a primary key Foreign key of a table is a candidate key in another table Super key uniquely identifies a row in a relation	4
7	Differentiate a primary key and a super key	3
8 .	Explain any two Unary Operations and Binary Operations	4

Chapter 12

STRUCTURED QUERY LANGUAGE (SQL)

STRUCTURED QUERY LANGUAGE (SQL)

Query based language for designing, accessing and manipulating data in a data base system.

SQL allows accessing a Database.
SQL allows defining a Database.
SQL can retrieve, insert, delete and update data.
SQL works with MS-Access, Oracle, DB2, PostgreSQL, MS-SQL, etc.

SQL Data types

1. **Char (size)** - used to store string of max. Size mentioned in bracket (allocate maximum size memory).

E.g.

Name Char (25),
Place Char (30),
Type Char (3),

2. **Varchar (size)** - used to store string of maximum size mentioned in bracket(variable size memory allocation, according to string size).

E.g.

Name varchar (30),
Address varchar (40),

3. **Int** – to store integer number.

E.g.

Age int
Mark int

4. **Decimal** – to store Decimal number.
   Syntax: Dec (size, scale)

E.g.

Dec (5,2)- means can store 5 digit decimal point and 2 digit right of decimal point

5. **Numeric**

Declared as NUMBER and is the same as decimal

E.g.

Number (5,2)

6. Small Integer

Declared as SMALLINT and is same as integer

E.g.

Class smallint

7. **Date** – to store date.

E.g.

Dob date

8. **Time** – to store time.

E.g.

Jointime time

SQL Statements/SQL Query

SQL Statements can be broadly classified into two, ***DDL (Data Definition Language)*** and ***DML (Data Manipulation Language).***

Data Definition Language (DDL)

DDL is collection of Commands that makes SQL Statements to define Structure of a Database, which include defining Database, Table, and Constraints. DDL related to Schema of a Database.

- CREATE TABLE
- ALTER TABLE
- DROP TABLE

Data Manipulation Language (DML)

DML is collection of Commands that makes SQL Statements to manipulate data in a database, like insertion, updating, deletion and retrieval of data according to the user requirement from a table. DML related to instance of a Database.

- INSERT INTO
- UPDATE
- DELETE
- SELECT

Data Definition Language (DDL Commands)

Create Table command

We can create new table using DDL Command **CREATE TABLE**

(Words in uppercase letters are SQL Commands, within < >are user defined names and within [ ] are optional parameters)

Syntax:

CREATE TABLE <table name> (<column name1> data type [column constraint], <column name2> data type [column constraint]....., <column name n> data type [column constraint]);

Create table student (rollno int, name varchar (20), class int, division varchar (10));

This command will create a table named ‘student’ in the memory in the following format

roll no	name	class	division

Rules for Naming a table
Rule1. Name must 'not' be a SQL keyword.
Rule2. Name must begin with an alphabet.
Rule3. Name may contain letters, alphabets and underscore (_).
Rule4. Name should 'not' be the name of another table.
Rule5. Name is same whether uppercase or lower case is used.

Constraints: Constraints are small rule applied on a column in a table. There are five constraints,

- **Primary key:** If a particular column is defined as primary key, we can enter only unique values to that column. it is used to eliminate redundant data. We can set more than one column as primary key, in such case both columns works together for storing unique data.

- **Unique:** If we set a column as primary key and need to be enter unique values to another column, in such case we can define that column within unique constraints.

- **Not null:** If **we** want, a column never be empty, then we can define such column with not null constraints.

- **Check:** If want to store only some predefined values to a particular column, we can use check constraints as follows.

- **Default:** It is used with column to set default value if user do not enter anything. Default can be used with those column, which is not defined using not null constraint.

Alter Table Command

We can change structure of a table (adding or removing columns) using DDL Command **ALTER TABLE**

Adding columns to existing table

Syntax:

ALTER TABLE <table name> ADD <column name> data type [Column constraints];

Example: Altering the above table by adding new columns, mark1 and mark2.

Alter table student add mark1 int2;

Alter table student add mark2 int2 not null;

To Modify an existing column

Syntax:

ALTER TABLE <table name> MODIFY <new data type> [(<new size>));

Drop Table Command

We can delete a table using DDL command **DROP TABLE**

E.g.: drop table student.

Data Manipulation Language (DML Commands)

Insert Into Command

We can insert a record or collection of records(populating table) using DML command **INSERT INTO**

Syntax:

INSERT INTO <table name>[(column1, column2,.....,column j)] VALUES ('value1', 'value2'...,'value j'); do not use single quarts for numerical values.

Example: inserting values into the above table student

Insert into table values (2001,1,'aaa','Kannur',45);

Insert into table (adm_no, roll_no, name, place, mark1) values (2002,2,'bbb', 'Kannur', 35);

Output

adm_no	roll_no	name	place	mark1
2001	1	aaa	Kannur	45
2002	2	bbb	Kannur	35

Here default value will set for column class.

Update Command

We can modify values of some records using DML Command **UPDATE**

Syntax:

UPDATE <table name> SET column>=<new value> ...<column> =<new value>
WHERE <condition>;

Example

update student set class='BSc', mark1=45 where adm_no=101;
update student set grade ='A+' where percent >= 80;

Delete Command

We can delete records using DML Command **DELETE**

Syntax:

DELETE FROM <table name> where <condition>;

Example

Delete from student where adm_no=102;

Select Command

We can retrieves values from a table using DML command **SELECT**

Syntax:

SELECT [DISTINCT] <column>,….,<column> | * FROM <table name> [where <condition>] [order by <column i> [asc | desc] ,…] [group by <column> having <condition>];

Example for select command based on this following table

Table name ‘student’

Adm_no	Name	Sex	course	Percent
101	Sandeep	M	Science	85
102	Manish	M	Commerce	75
103	Seema	F	Science	75
104	Rani	F	Humanities	80
105	Manu	M	Commerce	65

Query1. Select Adm_no, name form student;

Output

Adm_no	Name
101	Sandeep
102	Manish
103	Seema
104	Rani
105	Manu

Query2. Select * from student;
output

Adm_no	Name	Sex	course	Percent
101	Sandeep	M	Science	85
102	Manish	M	Commerce	75
103	Seema	F	Science	75
104	Rani	F	Humanities	80
105	Manu	M	Commerce	65

DISTINCT – *used to retrieve only distinct values i.e. it is used with SELECT command to avoid duplication.*

Query3. Select course from student;

Output

course
Science
Commerce
Science
Humanities
Commerce

Query4. Select distinct course from student;
Output

course
Science
Commerce
Humanities

WHERE *clause is used to select rows and columns of a table which satisfy some specific conditions*

SELECT <column> [, <column> …] FROM <table name> **WHERE** <condition>;

Operators used with condition are

=	for checking value is equal to value of the mentioned column
<>	not equal to
>	greater than
<	Less than
>=	greater than or equal to
<=	less than or equal to
LIKE	pattern matching
BETWEEN ... AND	value between a range
IN	match with list of values.
NOT IN	not matching with list of values
IS NULL	is a null value
NOT	true condition
AND	true if both conditions are true
OR	true if either of the operand condition is true

Example queries

Query 1.
Select * from student where place='kannur';

Selects all from student table whose place is equal to 'kannur'

Query 2
Select * from student where name like 'A%';

Selects all from student table whose Name start with A, i.e. % replace for any number of characters.

Query 3
Select * from student where name like '%m';

Selects all from student table whose name end with m

Query 4
Select * from student where name like '%la%';

Selects all from student table whose name contains la.

Query 5
Select * from student where name like '_at';

Selects all from student table match with three letter word. First character may be any letter. _ replaces for single character

Query 6
Select * from student where mark1 between 40 and 50;

Selects all from student table whose mark in between 40 and 50
Query 7
Select * from student where mark1 not between 20 and 35;

Selects all from student table whose mark is **not** in between 20 and 35
Query 8
Select * from student where mark1 in (40, 41, 42);

Selects all from student table whose mark in 40, 41, and 42.
Query 9
Select * from student where mark1 not in (40, 41, 42);

Selects all from student table whose mark **not** in 40, 41, and 42.

Query 10
Select * from student where mark1>25 order by name;
Selects all from student table **sorted** on the base of name whose mark is greater than 25
//default ascending

Query 11
Select * from student where mark1>25 order by name desc, place asc;

Selects all from student table **sorted** on the base of name in descending order whose mark is greater than 25 and place in ascending order

Complex Conditions (and, or & not)

select * from student where mark1>40 and place='kannur';
select * from student where mark1>40 or class='Bcom';

GROUP BY and HAVING

GROUP BY *is used retrieve records by grouping based on some columns.*

HAVING *is similar to* ***WHERE*** *clause, but it is used to apply conditions on groups and can be used with aggregate functions.*

E.g.:
SELECT place, min (mak1), max (mark1) FROM student WHERE class='Bcom' GROUP BY place HAVING count(*) >3;
In the above query,

- First select all rows that satisfying the condition **class='Bcom'**
- Forms group according to **place**

- Discard the group that do not satisfies the condition in the **having clause.** i.e number of records less than 3.
- Apply aggregate function on each group.
- Displays place with maximum and minimum mark of that place.

Aggregate functions

- **SUM(column name) -** Gives the total of the values of mentioned column
- **AVG(column name) -**Gives the average of the values of mentioned column
- **MAX(column name) -** Gives the largest of the values of mentioned column
- **MIN(column name) -** Gives the smallest of the values of mentioned column
- **COUNT (*) -** Gives the total number of records.

Examples:

- **Select SUM(mark1) from student;**
  Select sum of mark1 of student table
- **Select AVG(mark1) from student;**
- Select average of mark1 of student table
- **Select MAX(mark1) from student where place='Kannur';**
  Select maximum mark of student table whose place is kannur
- **Select COUNT(*) from student where mark1>40;**
  Select total number of students whose mark1 greater than 40 of student table

Question and Answers

1. Name some aggregate functions in SQL
   Answer: Sum (), Avg (), Max (), Min ()
2. The keyword _____ is used in a SELECT statement to avoid duplicate rows
   Answer: DISTINCT
3. The _____ operation is used to select types in a relation that satisfies a selection condition
   a) PROJECT b) SELECT c)EDIT d) UPDATE
   Answer: SELECT
4. In place of values, parameter substitution can be used with _____ command.
   a) Insert b) Replace c)Update d)Substitute
   Answer: Insert
5. Drop table command is used to _____
   Answer: Delete a table
6. Which of the following is a DDL command
   a) UPDATE
   b) INSERT INTO
   c) DELETE FROM
   d) ALTER TABLE
   Answer: ALTER TABLE
7. Which of the following is an essential clause used with select command
   a) Group by

b) Order by
c) Where
d) From
Answer: From

8. The _____ operator of SQL is used to match pattern with the help of %
a) Avg b) In c) And d) Like
Answer: Like
9. Order by clause is used to _____ the query results
Answer: Sort
10. _____helps a user in defining the data structure in a database
Answer: DDL
11. _____ clause can be used to get the sorted order of the rows in a table
a) Group by
b) Order by
c) Where
d) None of these
Answer: Order by
Which of the following is an aggregate function ?
a) Alter
b) Sum
c) Rollback
d) Revoke
Answer: Sum
12. Which of the following is not a set operation
a) +
b) –
c) “
d) U
Answer: +
13. The command used for changing the structure of a table is _____
Answer: Alter table
14. The aggregate function used to count the null values in a table is _____
Answer: Count
15. SQL command used to delete a table is _____
Answer: Drop table
16. Differentiate between ‘char’ and ‘varchar’ data types
Answer: ‘char’ data type is declared as char (size), where ‘size’ is a single non negative integer which represents the maximum size of the character. Varchar data type is defined as Varchar (size). The difference between char and varchar is that a field of char type always allocates memory storage for the maximum number of characters that can be stored in the field while varchar field will allocate only enough memory to store the actual size of varchar field.
17. Explain the syntax of SELECT command
Answer:
Syntax:

SELECT [DISTINCT] <column i>,….,<column j> | * FROM <table name> [where <condition>] [order by <column i> [asc | desc] ,…] [group by <column> having <condition>];

This query is used to extract or receive certain information from the table

18. What is meant by aggregate function in SQL? Explain about aggregate functions.
    Answer:
    Aggregate functions are predefined functions used to compute results of arithmetic operations and can be applied on any column of a table. The result of an aggregate function is a single value.
    Aggregate functions
    sum(column name) - Gives the total of the values of mentioned column avg(column name) - Gives the average of the values of mentioned column max(column name) - Gives the largest of the values of mentioned column min(column name) - Gives the smallest of the values of mentioned column
    count(*) - Gives the total number of records.
19. Explain the syntax of INSERT INTO command
    Answer:
    INSERT INTO
    Syntax:
    INSERT INTO <table name>[(column1, column2,.....,column j)
    VALUES 'value1', 'value2'...,'value j');
    do not use single quarts for numerical values.
    Example: inserting values into the above table student

    1. Insert into table values (2001,1,'aaa','BSc','Kannur',45);
    2. Insert into table (adm_no,roll_no,name,place,mark1) values(2002,2,'bbb', 'Kannur', 35); Here default value will set for column class.
20. State the difference between UNIQUE and DISTINCT command
    Answer:
    The UNIQUE is constraint used along with CREATE TABLE command to ensure that no two rows have same value in a specified column. The UNIQUE constraint can be applied to those columns that are declared NOT NULL.
    The keyword DISTINCT is used along with SELECT command to avoid duplication of rows in the selection. The usage of the Command is

    Select distinct <field name> from <table name>

21. Explain the constraints of CREATE command
    Answer:
    Constraints: Constraints are small rule applied on a column in a table. There are five constraints,
    - Primary key: If a particular column is defined as primary key, we can enter only unique values to that column. it is used to eliminate redundant data. We can set more than one column as primary key, in such case both columns works together for storing unique data.

    - Unique: If we set a column as primary key and need to be enter unique values to another column, in such case we can define that column within unique constraints.

- Not null: If we want, a column never be empty, then we can define such column with not null constraints.

- Check: If want to store only some predefined values to a particular column, we can use check constraints as follows.

- Default: It is used with column to set default value if user does not enter anything. Default can be used with that column, which is not defined using not null constraint.

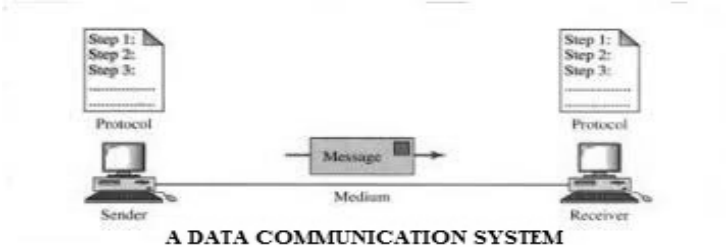
22. Explain ALTER TABLE command in SQL
    Answer: We can change structure of a table (adding or removing columns) using DDL Command ALTER TABLE
    Adding columns to existing table
    Syntax:
    ALTER TABLE <table name> ADD <column name> data type
    [Column constraints];
    Example: Altering the above table by adding new columns, mark1 and mark2.
    alter table student add mark1 int2;
    alter table student add mark2 int2 not null;

23. Write SQL commands to list the names of employees whose name contains "A" as the third alphabet from table employ
    Answer:
    Select name from employ where name like '—A%';
24. Give the difference between 'where' and 'having' clause
    Answer:
    In 'where' clause conditions are applicable on individual rows whereas in 'having' clause conditions are applicable on group as formed by group by clause.
25. Manu wants to create a table for new inventory application. The details are itemcode, description, stock quantity, recorded level. Write SQL commands to create this table with necessary constraints
    Itemcode should not be empty for any row and it must be primary key
    Description should have some value
    The reorder level should be at least 10
    Answer:
    Create table inventory (itemcode char (20) not null primary key, description varchar (15) not null, stockquantity integer, reorderlevel integer check reorderlevel >= 10);

Chapter 13

Data Communication

Data communication can be defined as communication between two computers. It contains a **sender, a receiver, and a communication channel**. In real life data communication process contains many hardware devices and software techniques which make it an extremely complex process.



A DATA COMMUNICATION SYSTEM

Definition

Data communication can be defined as the exchange of information between two computers.

Characteristics of a Data communication

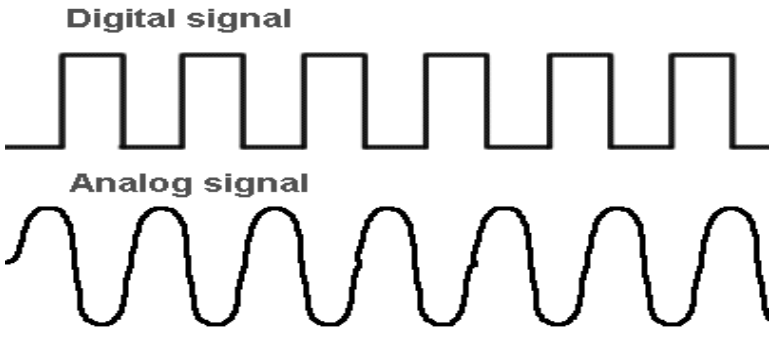
1. **Correct delivery**: - The sender transmits data to a receiver. It must reach only the correct receiver.
2. **Accurate delivery** : - The data sent must be received in the **same form**
3. **Timely delivery**: - The data must travel form sender to receiver in a finite amount of time.

ANALOG AND DIGITAL SIGNALS

Definition

An analog signal is a continuously varying signal (sinusoidal wave)

Digital Signal takes the form of pulses. It is not continuous



Frequency, Period, Amplitude and Phase of an analog signal.

Frequency is the number of cycles per second. i.e. It is the number of waves per second measured in hertz (Hz).

Example: Intel Pentium Microprocessor with 2.5 GHz speed

Period: The time taken for a wave to complete a cycle is called period.

Amplitude: - Height of a signal form a horizontal axis

Phase: The phase of a signal is related to the position of a wave relative to time and is measured in degrees.

DATA COMMUNICATION EQUIPMENTS

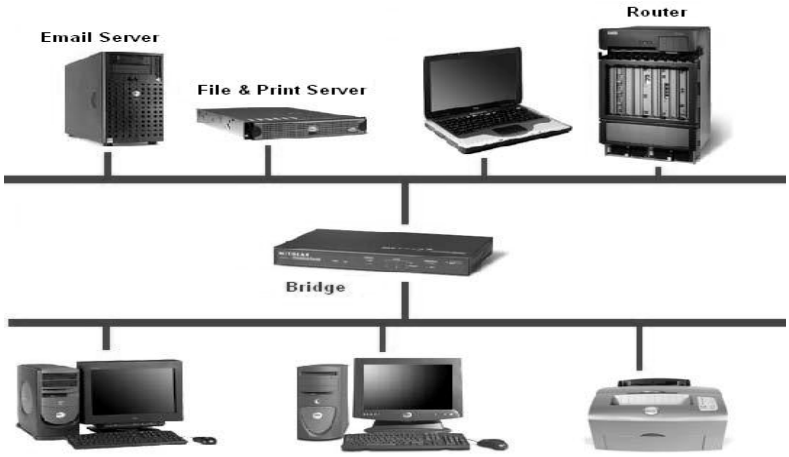
MODEM (MODulator DEModuator)

Modem stands for modulator demodulator. A modulator converts analog signal to digital (this process is called Modulation) and demodulator converts digital signal to analog (this process is called demodulation).

Example: BSNL Modem for Broad band Connection in our home, office, school etc.

BRIDGE

It is used to link to net works. It is used to connect same type of networks (LAN Local Area Networks).

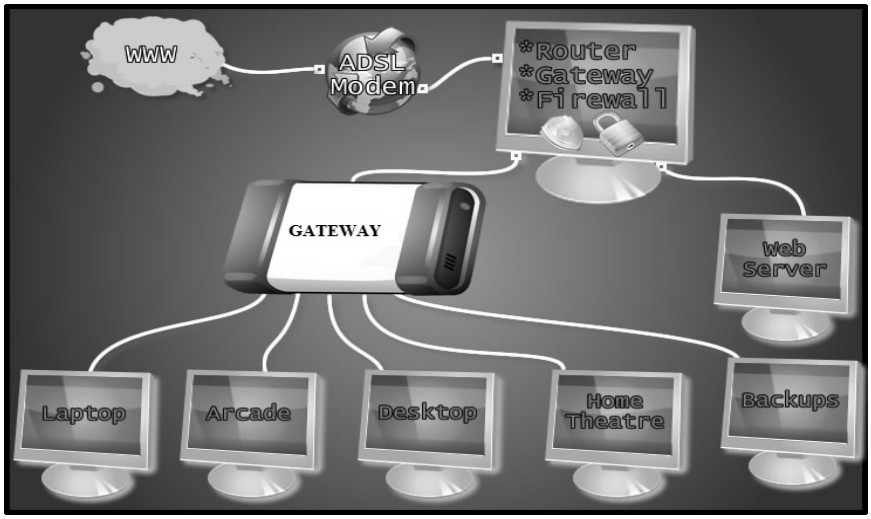


ROUTER

A router is similar in operation to a bridge. But it can connect two networks with different protocols. it joins two networks and routes the data from one place to another place.

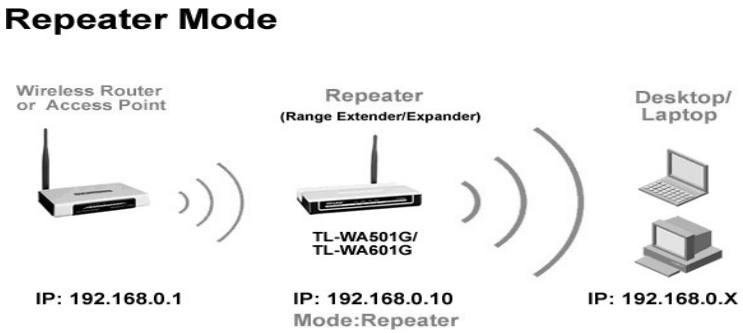
GATEWAY

It is a communication device that is used to connect two networks of different types.(LAN and WAN)



REPEATER

Repeater is a communication device which receives, amplifies and transmits the signals in both directions.

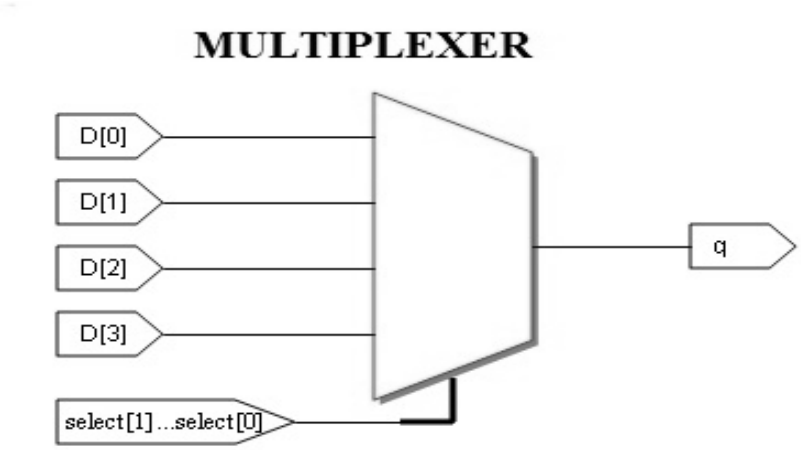


Attenuation

The degradation of signal strength while traveling through a medium

MULTIPLEXER

Multiplexer divides the physical lines into different channels. Multiplexer combines the inputs from different sources and loads them into different channels. The combined signals are separated by a device called de multiplexer.



Multiplexer combines the input from different sources, and load them on different channels of a medium.

COMMUNICATION MODES

Communication Modes

The different modes of transmissions are

1. Serial and Parallel communication

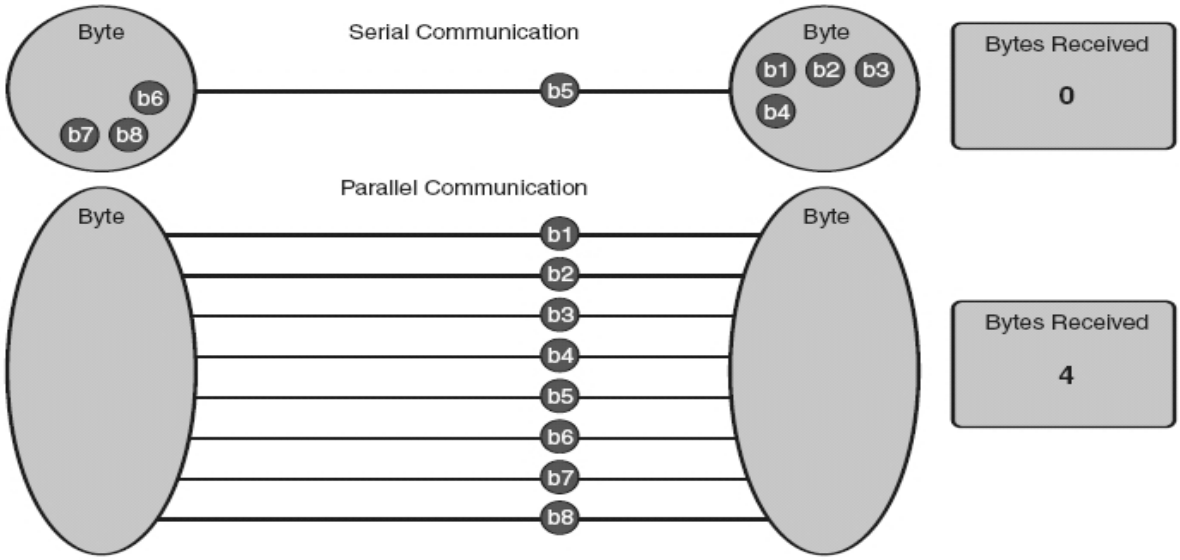
2. Asynchronous and Synchronous communication.

3. Simplex, Half Duplex and Duplex

1. Serial and Parallel Communication Mode

In **Serial communication** data is transmitted one after another in a serial manner. It uses the same channel for transmission. It is used for long distances communication.

In **Parallel communication** a word or a byte is transferred at a time. Therefore in a parallel communication it uses many wires for sending data. ***This method is used within the computer system, such as from the CPU registers to memory or vice versa.***



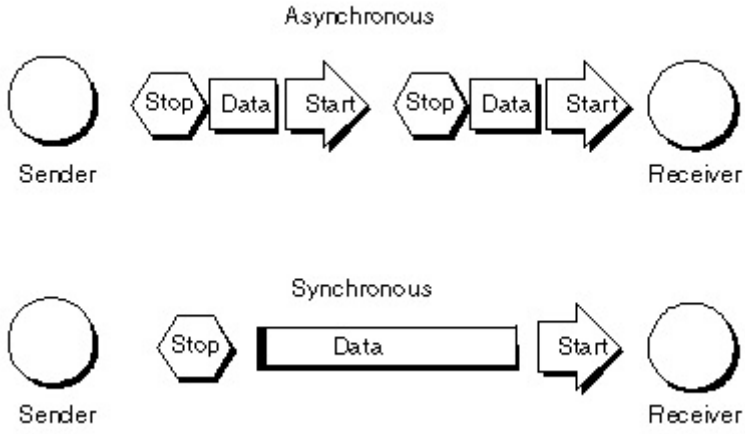
2. Asynchronous and Synchronous Communication Mode

In asynchronous transmission, one character is transmitted at a time. The transfer of data is controlled by start bits and stop bits. Each character is surrounded by bits at the beginning and end.

In synchronous transmission, Block of characters is transmitted at a time. Here the block of data contains a start bit and stop bit at the beginning and end.

A type of transmission technique in which one bit is transmitted at a time and each character is preceded by a start bit and ends with a stop bit is called ***Asynchronous transmission*** .

A type of transmission technique in which block of bits are transmitted at a time and each block is preceded and followed by a control signal is called ***Synchronous transmission.***

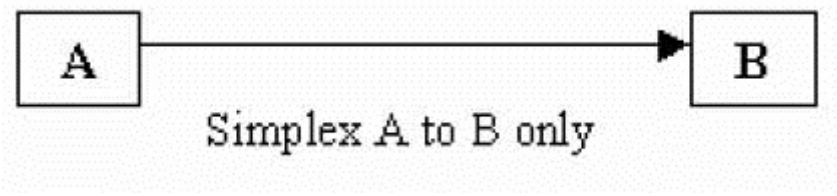


USART (Universal Synchronous Asynchronous Receiver Transmitter)

Universal Synchronous Asynchronous Receiver Transmitter (USART) convert data form parallel to serial at the transmitter end and serial to parallel at the receiver end. It is responsible for generating a character at the beginning of the data blocks

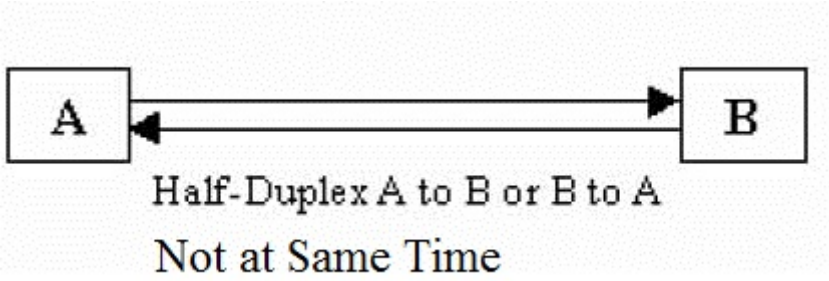
3. Simplex, Half Duplex and Full Duplex (Duplex)

Simplex Mode: - it is a type of communication mode in which data transmitted in only one direction.



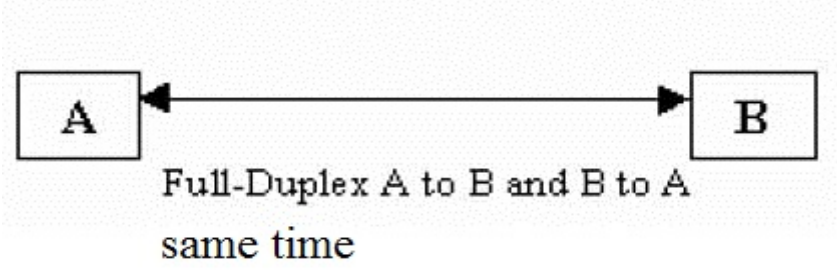
Example: A keyboard attached to the computer.

Half duplex Mode: - it is a type of communication mode in which data transmitted in both direction but not at a time.



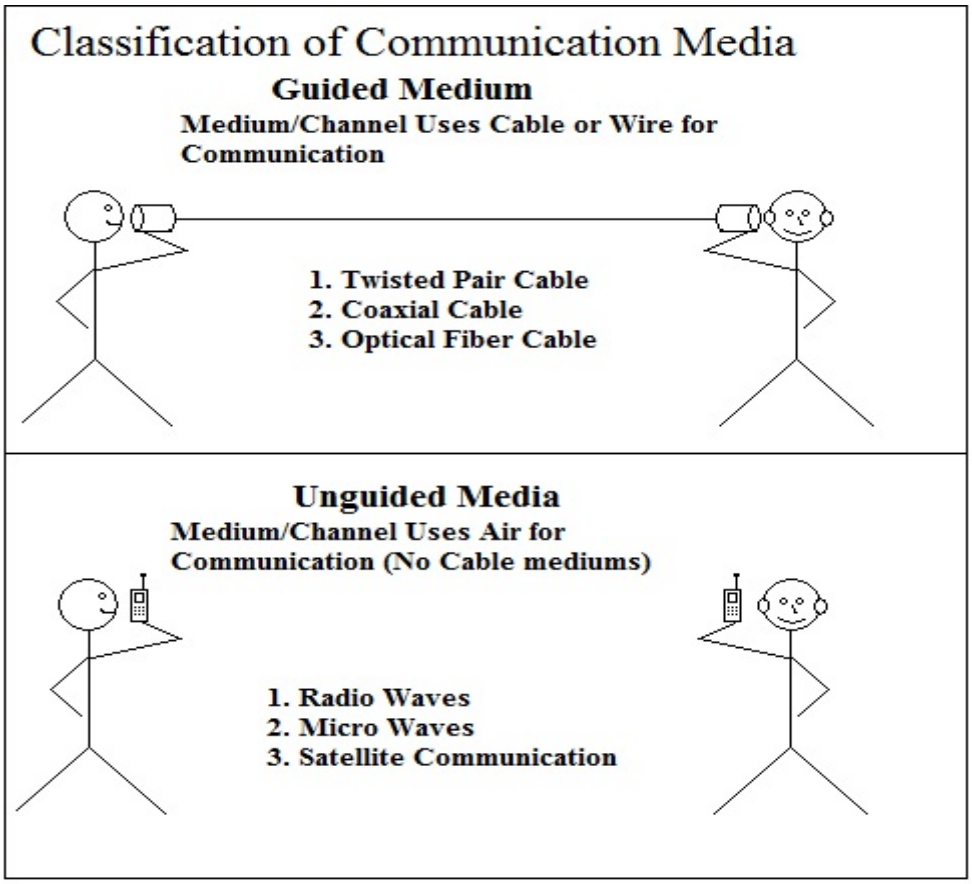
Example: walkie talkie communication.

Duplex Mode (full duplex): - It is a type of communication mode in which data transmitted in both directions simultaneously.



Example: Mobile or telephone communication.

Communication Medias (Communication Channels)



Guided Medium

TWISTED PAIR CABLE

A twisted pair cable consists of two insulated copper wires. The wires twisted together. The common use of twisted pair cable is in telephone system. The two types of twisted pair cables are

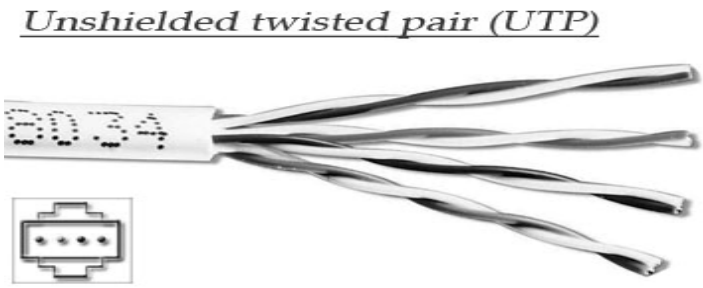
1. Shielded Twisted pair cable
2. Unshielded Twisted pair cable.

Shielded Twisted pair cable (STP): -In STP twisted wired covered by metal shield and plastic which eliminates Cross Talk (during telephone conversations we hear other conversations in the background).

- It is more expensive than UTP

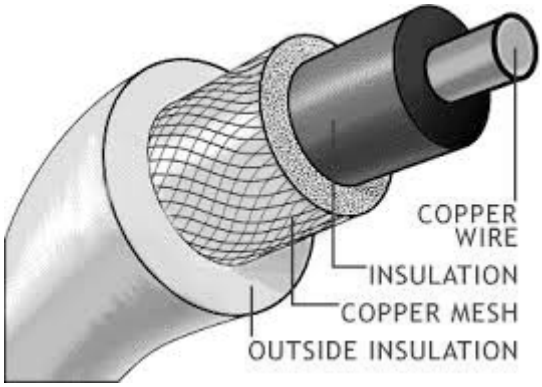
Unshielded Twisted pair cable (UTP): - The copper conductors are covered by PVC or other insulator.

- UTP is and flexible, less expensive and easy to install

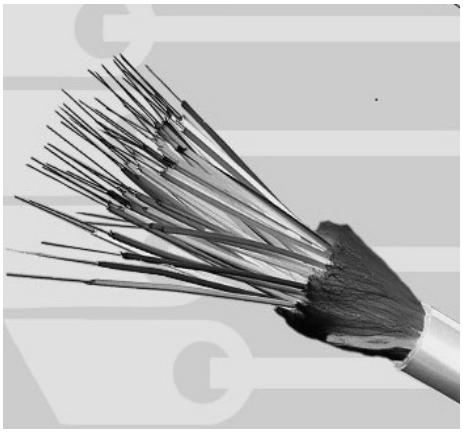


COAXIAL CABLE

This type of cable consists of a solid wire core surrounded by one or more wire shields, each separated by some kind of plastic insulator. Inner core carries the signal and the shield provides the ground. ***Coaxial cable is usually used in Cable TV communication***



OPTICAL FIBRE



Optical fibers consist of an inner core of glass or glass like material which transmit light. It is covered by glass material called cladding. They carry light form source at one end of the fiber to a detector at the other end. The light sources used are either LED (Light Emitting Diodes) or Injection Laser Diodes (ILD). The bandwidth of the medium is potentially high therefore data communication through this medium is very high.

Advantages of Optical Fiber

- ***Resistance to noise***: since optical fiber uses light source for communication, it resists the problem due to noise.

- ***High bandwidth***: the bandwidth offered by optical fiber is high compared to other cables.
- ***High signal carrying capacity***: signal carried by optical fiber can travel over a long distance.

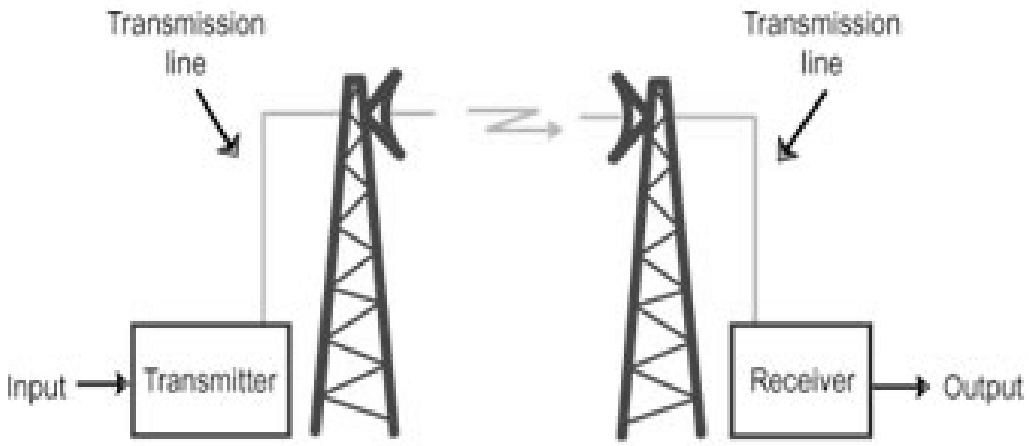
Disadvantages of Optical Fiber

- ***Fragility***: Chances of Breakage is higher
- ***Cost***: Optical fiber is expensive because it is extremely pure to carry signals without damaging over a long distance. Laser sources are also expensive.
- ***Maintenance:*** optical fiber need more maintenance

Unguided Medium

MICRO WAVE

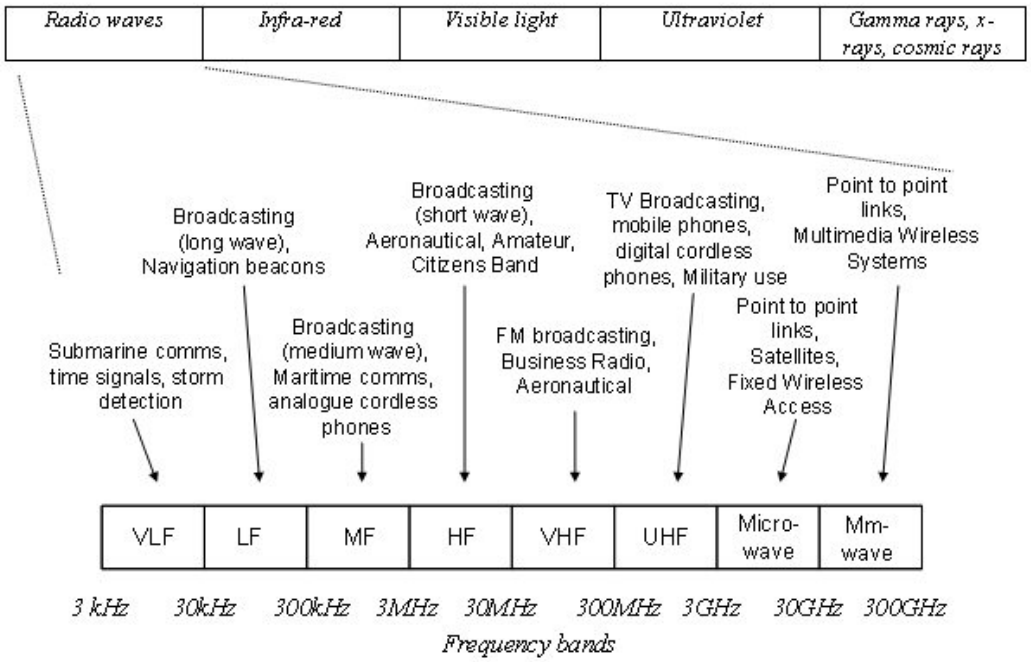
Micro wave signal are used to transmit data without using cables. The microwave signals are similar to radio and television signals and are used for long distance communication. In microwave communication dish antennas are used. ***Microwave transmission is line of sight transmission***.



A Microwave Communication

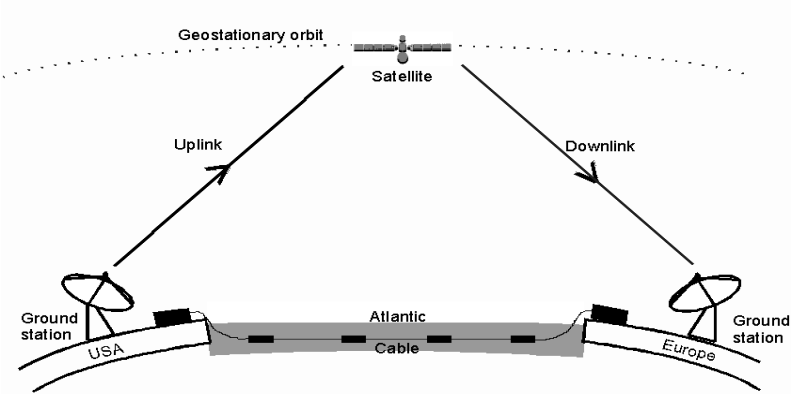
RADIO WAVES

Radio waves are waves whose frequency ranges from 3 KHz to 300 GHz. It contains different communication bands.



SATELLITE

Satellite communication method is used to transmit data to long distance. Satellites are placed in atmosphere and it revolves with a speed of earth. Most communication channels have number of transponders for receiving and sending data. Usually one particular frequency is used for communication between earth to satellite (this process is called **Uplinking**) and another frequency is used for communication between satellite to earth (this process is called **Downlinking**)



Questions and answers

1. _____ wave use line of sight propagation and are used for TV, Mobile Phone, Microwave links
   Answer: Radio wave/UHF/VHF/Microwave
2. Name of the light source in Optical Fiber
   Answer: Light Emitting Diode (LED) and Injection Laser Diode (ILD)
3. Communication is unidirectional in---------- mode

Answer: Simplex

4. In ---------- communication mode, both the devices can transmit the data at the same time.
   Answer: Full Duplex.
5. A multiplexer allows _____
   a) Several terminals to share many lines.
   b) Several terminals to share one high speed line.
   c) One terminal to share many lines.
   d) Many terminals to share a modem.

   Answer: b) several terminals to share one high speed line

6. URL Stands for _____
   Answer: Universal Resource Locator
7. WAP stands for _____
   Answer: Wireless Application Protocol
8. The strength of the signal is known as
   a) Amplitude
   b) Period
   c) Frequency
   d) Phase

   Answer: Amplitude

9. Which device combines the inputs from different sources and load them on different channels of a medium.
   Answer: Multiplexer
10. The number of cycles per second of a signal is called ----------
    Answer: Frequency
11. Name the special purpose device that allows communication between dissimilar networks
    Answer: Gateway
12. _____ is used to connect two networks of different protocols
    a) Modem
    b) Multiplexer
    c) Repeaters
    d) Routers

    Answer: Routers.

13. Which of the following is used as a means of signal propagation in optical fibers
    a) Sound b)Lightc)Electrical Signal d) Digital Signal

    Answer: Light

14. What is a router?

Answer: A router is similar in operation to a bridge. But it can connect two networks with different protocols. I. e it joins two networks and routes the data from one place to another place

15. Mention the main characteristics of communication system

    Answer:

    Correct delivery: - the sender transmits data for a receiver; it must reach only the correct receiver not someone else.

    Accurate delivery: - the data sent must be received in the **same form**

    Timely delivery: - the data must travel form sender to receiver in a finite amount of time.

16. Write two applications of MODEM

    Answer: Modem accepts digital signal from computer and converts it to modulated analog wave that can be transmitted over a telephone line. Modem also accepts modulated analog wave from telephone lines and converts it to digital form at the receiving end.

17. Write a short note on multiplexer.

    Answer: Multiplexer divides the physical lines into different channels. Multiplexer combines the inputs from different sources and loads them into different channels. The combined signals are separated by a device called demultiplexer.

18. Write advantage of optical fiber over twisted pair and coaxial cable

    Answer:

    (1) The bandwidth of the medium is very high
    (2) Optical Fiber cable support higher data rates
    (3) Optic fiber has complete immunity to noise and signal.

19. Differentiate between Asynchronous and synchronous data communication

    Answer:

    A type of transmission technique in which one bit is transmitted at a time and each character is preceded by a start bit and ends with a stop bit is called ***Asynchronous transmission*** .A type of transmission technique in which block of bits are transmitted at a time and each block is preceded and followed by a control signal is called ***Synchronous transmission.***

20. Explain the function of USART

    Answer: Universal Synchronous Asynchronous Receiver Transmitter (USART) convert data form parallel to serial at transmitter end and serial to parallel at receiver end. It is responsible for generating a character at the beginning of the data blocks.

21. What is meant by Protocol?

    Answer: a protocol is a set of rules and conventions that are **applicable** for a network. A protocol defines mainly

    a) Syntax it defines the structure or format of data to be communicated.
    b) Semantics: it defines the interpretation of the data that is being sent.
    c) Timing: this refers to an arrangement between sender and the receiver.

22. Define attenuation

    Answer: the losing of signal strength as a wave travel through a medium is termed as attenuation.

23. Explain any three data communication devices

Answer:

BRIDGE: It is used to link to net works. It is used to connect same type of networks (LAN Local Area Networks).

ROUTER a router is similar in operation to a bridge. But it can connect two networks with different protocols. I. e it joins two networks and routes the data from one place to another place.

GATEWAY it is a communication device that is used to connect two networks of different types.

24. Name the three methods communication modes

Answer:

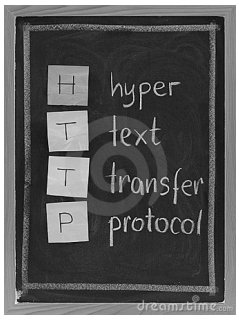
The different modes of transmissions are

1. Serial and Parallel communication
2. Asynchronous and Synchronous communication.
3. Simplex, Half Duplex and Duplex

Communication Protocols

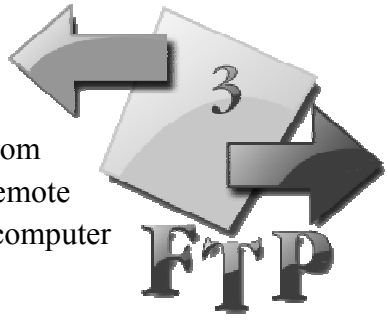
Communication Protocols are set of rules used for effective communication.

HTTP (Hyper Text Transfer Protocol)



This protocol is used to transfer hyper text documents from one computer to another computer. It is used to communicate a web server (System that hold website) and web client (System that request for websites).

FTP (File Transfer Protocol)



FTP is a method or a set of rules used for transferring files from one computer to another computer. FTP copies files from remote server to our own computer and transferring files from our computer to some remote computer

TCP/IP (Transmission Cotrol Protocol/Internet Protocol)

Computers in the same network communicate with each other with a physical address. TCP/IP provides a way to communicate effectively between computers. TCP provides services to many applications and IP provides getting data packets to their destination.

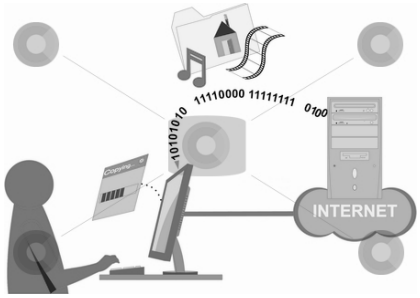
ACCESS METHODS

CSMA/CD (Carrier Sense Multiple Access/Collision Detection)
In CSMA/CD every node listens before transmitting on the network and will transmit if the network is free.

TOKEN PASSING
In this method a special bit pattern called **token** flowing around the network. When a node wants to transmit data, it receives an empty token and inserts data. This token is sent on a complete network. When the token returns the original sender, the message is removed.

Internet terminologies

Website
Website is a collection of web pages. The first page of website is called home page. A website will give you information about a person, a company, an organization or an event in the form of text, graphics and sound.



Example www.facebook.com

WWW (World Wide Web)
www is a service operated by the internet to access any document on the network without actually logging in.

URL (Uniform Resource Locator)
The complete address of a webpage is called URL

HTML (Hyper Text Markup Language)
HTML is a markup language used to design a webpage. This markup language is used to construct hyperlinks i. e moving/navigating from one page to another. HTML uses command which is called tags.

WEB PAGE
A webpage is a simple text file that contains not only text but also a set of HTML tags that describes how the text should be formatted when browser displays it on the screen.

Questions and answers

1. Name the application level protocol with lightness and speed necessary for distributed, collaborative hyper media information systems.
   Answer: Hyper Text Transfer Protocol (HTTP)
2. Which of the following is not a browser program ?
   a) MOSAIC b) Windows Explorer c)Internet Explorer d) Netscape navigator

   Answer: Windows Explorer

3. If Ramu wants a shareware program that is available on the internet, he could transfer the program to his computer using _____protocol.
   Answer: File Transfer Protocol (FTP)
4. Name the protocol that secures web transactions.
   Answer: HTTP
5. What is the use of a web browser? Give examples.
   Answer: a browser is software that act as an interface between user and www. This program allows sending request to web server for information and view the information on user computer.
   Examples of web browsers are
   a) Microsoft Internet Explorer
   b) Netscape navigator
   c) Mosaic
   d) Opera
   e) Mozilla Firefox
6. Why channel access methods are necessary in communication? Explain.
   Answer: the function of access methods is to control use of cabling system so that devices can share the cable and communicate with the desired recipient work station. The widely used methods are
      a) Carrier Sense Multiple Access/ Collision Detection
      b) Token Passing

   a) CSMA/CD (Carrier Sense Multiple Access/Collision Detection)
      When a node (Work Station) transmits a packet data form source to destination when it overlaps another, collision occurs. And data packets are destroyed due to this collision. In CSMA/CD work station monitor the collision, when collision detected, transmission is halted.
   b) TOKEN PASSING
      In this method a special bit pattern called token flowing around the network. When a node wants to transmit data, it receives an empty token and inserts data. This token is sent on a complete network. When the token returns the original sender, the message is removed.