UNIT – 1

NETWORKING AND OPEN STANDARDS

Important Definitions
Network: A Computer Network is a number of computers (Usually called terminals interconnected by one or more transmission paths.

Need of Networking:
1. Resource Sharing
2. File and data sharing.
3. Data security and centralized security
4. High Reliability :
5. Communication Media

Application of Networks
1. Sharing of data, services and resources
2. Access to remote database
3. Communication facilities

Elementary Terminology of Networks :
1. Nodes (Workstations):- The term nodes refer to the computers that are attached to a network and are seeking to share the resources.

2.   Server:- A computer that facilitates the sharing of data, software and hardware resources on the network

3.   Network Interface Unit (NIU) or NIC:- An interpreter that helps establish a connection between the servers and workstations.

4. **MAC Address**:-It refers to the physical address assigned by NIC manufacturers. It is a unique 6 byte address separated by colon where first three bytes refer to manufacturer id and last three are card no.
e.g. 10:B5:03:63:2E:FC

4. IP Address:- Every machine on a TCP bar IP Network has a unique identifying no. called an IP Address.
e.g.216.27.61.231

5. Domain Name:-It is a unique name assigned to a website. It has three parts:
    i) www
    ii) Name describing the website's purpose
    iii)TLD(Top Level Domain) such as .com, .net, .in, .edu, .org etc.

6.DNS(Domain Name Resolution):- It refers to the process of obtaining corresponding IP Address from a domain name.

NETWORK TOPOLOGIES : The pattern of interconnection of nodes in a network is called Topology.

  1) **Bus Topology or Linear Topology :** In this topology a single length of the transmission medium is used onto which the various nodes are attached. The transmission from any station travels the length of the bus, in both directions and can be received by all other stations. The bus has a terminator at either end which absorbs the signal, removing it from the bus.

Characteristics:

1. Short cable length and Simple wiring layout

2. A single cable called trunk is used through which all data propagates and to which all nodes are connected

3. Easy to extend

4. There is no central point of failure on a bus because there is no hub.

5. Entire network shuts down if there is break in the main cable.

6. Terminators are required at both ends of the backbone cable.

7. Addition of nodes negatively affects the performance of the whole network.

2) Ring Topology: In a ring topology each node is connected to two and only two neighboring nodes. Data is accepted from one of the neighboring nodes and is transmitted onwards to another. Thus data travels only in one direction.

1. Every computer serves as a repeater to boost signals

2. Short cable length.

3. Suitable for optical fiber

4. Difficult to add computers

5. More expensive

6. If one computer fails, whole network fails

7. Data clashes can also occur if two machines send messages at the same time.

3) Star Topology: A star topology is designed with each node connected directly to the server via hub or switch. This topology is used in most existing information network. Data on a star network passes through the hub or concentrator before continuing to its destination.

1. Easy to install and wire

2. No disruptions to the network when connecting or removing devices.

3. Easy to add new station as each station has direct cable connection to hub or switch.

4. Depending on the intelligence of hub, two or more computers may send message at the same time

5. One malfunctioning node does not affect the rest of the network.

6. Required more cable length than a linear topology.

7. All signals transmission through the hub; if down, entire network down

4) Tree Topology

A tree topology (hierarchical topology) can be viewed as a collection of star networks arranged in a hierarchy. This tree has individual peripheral nodes (e.g. leaves), which are required to transmit to and receive from one node to other node and are not required to act as repeaters or regenerators. Unlike the star network, the functionality of the central node may be distributed.

As in the conventional star network, individual nodes may be isolated from the network in case of failure, if a link connecting a leaf fails, that leaf is isolated. If a connection to a non-leaf node fails, an entire section of the network becomes isolated from the rest.

NETWORK DEVICES

1. MODEM(MOdulator DEModulator) : Modem is a device that converts digital data originating from a terminal or computer to analog signals used by voice communication network such as the telephone system.

At one end, modems convert the digital pulse to audible tones and convert audio tones back to digital pulses at the other

2. RJ –45 Connector:

The RJ-45 is a single line jack for digital transmission over ordinary phone wire. It is a 8 wire connector which is commonly used to connect computers on the LAN(especially Ethernets). RJ – short for Registered Jack – 45

3. **Hub:** Hub is a device used to connect several computers together. It is a multi-port card. Hubs forward any data packets including e-mail, word processing documents or print request – they receive over one port from one workstation to all of their remaining ports

4. Switches : Switches are smart hubs that send data directly to the destination rather than everywhere within network. When the switch receives a packet, the switch examines the destination and source hardware address and compare them to a table of a network segments and addresses. If the segments are the same the packet is dropped and if the different then the packet is forwarded to the proper segments.

5. Repeaters : A repeater is a device that amplifies a signal being transmitted on the network. Since a signal loses strength as it passes along a cable, it if often necessary to boost the signal with this device.. The repeater electrically amplifies the signal it receives and rebroadcasts it.

6. Router: A device that works like a bridge but can handle different protocols, is known as router. It is used to separate different segments in a network to improve performance and reliability.

7. Gateway : A network device that connects dissimilar networks. It establishes an intelligent connection between a local network and external network with completely different structures.

8. **Bridges**: It is used to interconnect two LANs which are physically separate but logically same.

Types of Networks
1. **LAN(Local Area Network):-**Small computer networks that are confined to a localized area(e.g. in an office, a building, or a factory)
2. **MAN(Metropolitan Area Network):** These are spread over a city. E.g. Cable TV Networks.
3. **WAN(Wide Area Network):-**These are spread across countries and facilitate fast and efficient exchange of information at lesser costs and high speeds. E.g. Internet
4. **PAN(Personal Area Network):** Refers to a small network of communication capable IT enabled devices within a range of upto 10 meters. It can be wired(using USB) or wireless(using Bluetooth)

Communication Media:-
Wired Transmission Media:-
Twisted Pair:
A cable composed of two small-insulated conductors twisted together without a common covering. Also known as copper pair. The wires are twisted around each other to minimize interference from other twisted pairs in the cable. Twisted pairs have less bandwidth than coaxial cable or optical fiber.

Coaxial Cables:
A cable consisting of two concentric conductors (an inner conductor and an outer conductor) insulated from each other by a dielectric, commonly used for the transmission of high-speed electronic data and/or video signals. Coaxial cable is used as a transmission line for radio frequency signals, in applications such as connecting radio transmitters and receivers with their antennas, computer network (Internet) connections, and distributing cable television signals.

Optical Fiber:
A flexible optically transparent fiber, usually made of glass or plastic, through which light can be transmitted by successive internal reflections.
An optical fiber is made up of the core, (carries the light pulses), the cladding (reflects the light pulses back into the core) and the buffer coating (protects the core and cladding from moisture, damage, etc.). Together, all of this creates a fiber optic, which can carry up to 10 million messages at any time using light pulses.

Ethernet Cables:
Ethernet is used to connect computers in a company or home network as well as to connect a single computer to a cable modem for Internet access.

Wireless Technologies:
Bluetooth:
Bluetooth is an open wireless technology standard for exchanging data over short distances (using short length radio waves) from fixed and mobile devices, creating
personal area networks (PANs) with high levels of security.

Infra Red Technologies:
Infrared is electromagnetic energy at a wavelength or wavelengths somewhat longer than those of red light. IR wireless is used for short- and medium-range communications and control.
IR wireless technology is used in intrusion detectors; home entertainment control units; robot control systems; cordless microphones, headsets, modems, and printers and other peripherals.
IR wireless cannot pass through walls. Therefore, IR communications or control is generally not possible between different rooms in a house, or between different houses in a neighborhood.

Microwave Link:
A microwave link is a communications system that uses a beam of radio waves in the microwave frequency range to transmit video, audio, or data between two locations, which can be from just a few feet or meters to several miles or kilometers apart.
Microwave links are commonly used by television broadcasters to transmit programmes across a country, for instance, or from an outside broadcast back to a studio.

Satellite Link:
A satellite link is a communications subsystem that involves a link between a transmitting earth station and a receiving earth station via a communications satellite.

Network Security:

Network security consists of the provisions made in an underlying computer network infrastructure, policies adopted by the network administrator to protect the network and the network-accessible resources from unauthorized access.

Threats

Snooping: Refers to unauthorized access of someone else's data, email, computer activity or data communication.

Eavesdropping: Act of secretly listening someone else's private communication/data or information.

Denial of Services Attack: Attacks that prevent the legitimate users of the system , from accessing the resources , information or capabilities of system.

Measures of security:

Firewall: System designed to prevent unauthorized access to or from a private network. Proper security policy for your organization. Giving file permissions

FREE AND OPEN SOURCE SOFTWARE

Free Software: It means software is freely accessible, free to use, changed, improved, copied, and distributed without any payments.

Four kinds of freedom

> Freedom to run the program for any purpose
> Freedom to redistribute copies.

> Freedom to study how the program works
> Freedom to improve the program and release your improvements to the public.

Open Source Software:

Definition: The categories of software / programs whose Licenses do not impose many conditions.
Features:

> Freedom to run and use the software
> Modify the program
> Redistribute copies of either original or modified program (without paying royalties to previous developers).

It can be freely used for modifications, but it does not have to be free of charge. Its source code is available.

Criteria for the distribution of open source software

> Free distribution
> Source code

> Derived works
> Integrity of the Author's Source code

> No discrimination against fields of endeavor.
> Distribution of License
> License must not be specific to a product
> License must not restrict other software

FLOSS (free libre and open software):

> Free software- no payments
> Open source software- for technical progress

OSS

> OSS- Source code is available

(Open source modified and redistributed software) free of cost or with nominal charge.

FSF (Free Software Foundation)
Non-profit organization created for the purpose of supporting free software movement.
GNU (GNUs Not Unix)
 To create a system compatible to UNIX but not identical with it.
Now it offers a wide range of software, including applications apart from operating system.
Proprietary software (neither open nor freely available)
 Its use is regulated and further distribution and modification is either forbidden or requires special permission by the supplier. Source code is not available.
Freeware
Free of cost
Copying and further distribution but not modification.
Source code is not available
E.g. Microsoft Internet Explorer
Shareware
Right to redistribute copies
After a certain period of time license fee should be paid.
Source code is not available.
Modifications are not possible.
Main aim is to increase user's will to pay for the software. Limits functionality after a trial period of 1-3 months.
Some Open Source Softwares
LINUX
Linux: - free and open source operating system software.
It can be downloaded from www.linux.org
Linux is a part of popular web server program LAMP (Linux, apache, MySql, PHP).
Mozilla
Freeware
No source code available
Free internet browsing software
It can be downloaded from www.mozilla.org
Apache Server
The most common web server (or HTTP server) software on the Internet.
Apache is designed as a set of modules, enabling administrators to choose which features they wish to use and making it easy to add features to meet specific needs including handling protocols other than the web-standard HTTP.
Apache HTTP server is an open source web server.
It is component of LAMP.
Proprietary Standards and Open Standards.
Proprietary standards are those for which users have to buy license to use them. For e.g. MS Office format .doc, .ppt, .xls etc
Open Standards are internationally accepted technical standards that guarantee that data can be exchanged across platforms and for any applications. Open is feely open to all.
Advantages of Open Standards:
Making the data accessible to all.
It ensures data is application and platform independence.
Diversity and Interoperability in the Industry i.e. it enables business and people to go for any technology of their choice as per their needs and budget.
E.g.: ASCII Characters, HTML file, Joint Photographic Expert Group, Portable Network Graphic etc.
Ogg Vorbis:
It is a new audio compression which is open format developed by Xiph.org. It is roughly comparable to mp3, mpeg-4 formats and is completely free, open and unpatented.

Indian Language Computing:
Indian Language computing refers to ability to interact in diverse Indian language on electronic system.

Representing characters in Memory:
> **ASCII:** American Standard Code for Information Interchange is widely used alphanumeric code in most microcomputers and minicomputers and in many mainframes. It is 7 bit code hence it can represent standard 2^7 =128 characters.

> **ISCII:** Indian Standard Code for Information Interchange (ISCII) is an eight bit code capable of coding 256 characters. It retains all ASCII characters and also offers coding for Indian Scripts. Thus it is also called as Indian Script code for Information Interchange.

> **Transliteration:** When we type Indian Language words phonetically in English script and tool will automatically convert them into corresponding language words called as transliteration. E.g. UNICODE for typing hindi letters

Unicode:-
Unicode provides a unique number for every character, no matter what the platforms, no matter what the program, no matter what the language. Unicode can represent more than 94000 characters.

Unicode standard has incorporated Indian Scripts under the group named Asian scripts. Indian scripts included as Devnagari, Bengali, Gurumukhi, Gujarati, Oriya, Tamil, Telgu, kannada, and Malayalam.

Fonts:
A Font refers to a set of displayable text characters called glyphs, having specific style and size.
There are two categories of font: **True Type Font** and **Open Type Font**.
> **True Type Font**: It is developed by Apple and licensed to Microsoft. It is 8 bit font which is compatible with Microsoft Windows and MAC OS.

> **Open Type Font**: It is the extension of the True Type Font Format which is 16 bits font and support 65536 characters (Unicode characters).

Indian Language Text Entry:
Many Tools / software have been developed to facilitate the typing of Indian Language text. There are two types text entries:
> **Phonetic Text Entry**: Words typed as per their pronunciation in English script and later on converted to Corresponding (Hindi/Gujarati) language work is known as phonetic text entry.

> **Key map based text entry:** When you type text from a keyboard having key mapping of Indian language characters, is known as key map based text entry..

UNIT – 2
PROGRAMMING

JAVA GUI PROGRAMMING REVISON TOUR –I

Programming Fundamentals
Token

The smallest individual unit in a program is known as Token. Java has the following types of tokens:-Keyword ,Identifier, Literals, Punctuators and operators.

Keywords:

The following list shows the reserved words in Java. These reserved words may not be used as constant or variable or any other identifier names. (do, goto,if, else, float, int etc..)

A literal is a source code representation of a fixed value. They are represented directly in the code without any computation. Literals can be assigned to any primitive type variable. For example:

```
byte a =
68; char
a = 'A'
```

byte, int, long, and short can be expressed in decimal(base 10), hexadecimal(base 16) or octal(base 8) number systems as well.

Prefix 0 is used to indicate octal and prefix 0x indicates hexadecimal when using these number systems for literals. For example:

```
int decimal =
100; int octal
= 0144; int
hexa = 0x64;
```

String literals in Java are specified like they are in most other languages by enclosing a sequence of characters between a pair of double quotes. Examples of string literals are:

```
"Hello
World"
"\"This is in quotes\""
```

String and char types of literals can contain any Unicode characters. For example:

```
char a =
'\u0001'; String
a = "\u0001";
```

Identifiers

All Java components require names. Names used for classes, variables and methods are called identifiers.

In Java, there are several points to remember about identifiers. They are as follows:

- All identifiers should begin with a letter (A to Z or a to z), currency character ($) or an underscore (_).

- After the first character identifiers can have any combination of characters.

- A key word cannot be used as an identifier.

- Most importantly identifiers are case sensitive.

- Examples of legal identifiers: age, $salary, _value,   1_value

- Examples of illegal identifiers: 123abc, -salary

Java Operators

Java provides a rich set of operators to manipulate variables. We can divide all the Java operators into the following groups:

- Arithmetic Operators

- Relational Operators

- Bitwise Operators

- Logical Operators

- Assignment Operators

- Misc Operators

Data Types

There are two data types available in Java:

- Primitive Data Types

- Reference/Object Data Types

Primitive Data Types:

There are eight primitive data types supported by Java. Primitive data types are predefined by the language and named by a keyword. Let us now look into detail about the eight primitive data types.

Byte, short, int, long, float, double, Boolean ,char

Reference Data Types:

- Reference variables are created using defined constructors of the classes. They are used to access objects. These variables are declared to be of a specific type that be changed. For example, Employee, Puppy etc.

- Class objects, and various type of array variables come under reference data type.

- Default value of any reference variable is null.

- A reference variable can be used to refer to any object of the declared type or any compatible type.

- Example: Animal animal = new Animal("giraffe");

Scope of a variable:-The part of program where a variable is usable is called scope of a variable.
Block: A group of statement enclosed in pair of parenthesis is called block or a compound statement

Programming Construct
1. **Sequence**
2. **Selection:-Simple if, If-Else, else if ladder, Switch**
3. **Iteration:- while ,do-while, for loop**

Entry control loop/Pre-tested loop/Top-tested loop

An entry control loop first test the terminating condition and then executes the loop body. If the condition is found true the loop body is execute otherwise the loop terminates. In case if the condition is false in first in the first time only then loop will not get executes even once.

Exit control loop/Post- tested loop/Bottom-tested loop

An exit control loop first executes the loop body and then test the terminating condition .if the condition is found true the loop body executed again otherwise the loop terminates. .In case if the condition is false in first time only then the loop will still get execute at least once.

Commonly available Swing Controls in Java

- **JPanel** is Swing's version of the AWT class Panel and uses the same default layout, Flow Layout. JPanel is descended directly from JComponent.
- **JFrame** is Swing's version of Frame and is descended directly from that class. The components added to the frame are referred to as its contents; these are managed by the content Pane. To add a component to a JFrame, we must use its content Pane instead.
- **JInternalFrame** is confined to a visible area of a container it is placed in. It can be confined , maximized and layered.
- **JWindow** is Swing's version of Window and is descended directly from that class. Like Window, it uses Border Layout by default.
- **JDialog** is Swing's version of Dialog and is descended directly from that class. Like Dialog, it uses BorderLayout by default. Like JFrame and JWindow,
JDialog contains a rootPane hierarchy including a contentPane, and it allows layered and glass panes. All dialogs are modal, which means the current
thread is blocked until user interaction with it has been completed. JDialog class is intended as the basis for creating custom dialogs; however, some of the most common dialogs are provided through static methods in the class JOptionPane.
- **JLabel**, descended from JComponent, is used to create text labels.

- The abstract class Abstract Button extends class JComponent and provides a foundation for a family of button classes, including **JButton**.
- **JTextField** allows editing of a single line of text. New features include the ability to justify the text left, right, or center, and to set the text's font.
- **JPasswordField** (a direct subclass of JTextField) you can suppress the display of input. Each character entered can be replaced by an echo character.
  This allows confidential input for passwords, for example. By default, the echo character is the asterisk, *.
- **JTextArea** allows editing of multiple lines of text. JTextArea can be used in conjunction with class JScrollPane to achieve scrolling. The underlying JScrollPane can be forced to always or never have either the vertical or horizontal scrollbar;
  JButton is a component the user clicks to trigger a specific action.
- **JRadioButton** is similar to JCheckbox, except for the default icon for each class. A set of radio buttons can be associated as a group in which only
  one button at a time can be selected.
- **JCheckBox** is not a member of a checkbox group. A checkbox can be selected and deselected, and it also displays its current state.
- **JComboBox** is like a drop down box. You can click a drop-down arrow and select an option from a list. For example, when the component has focus,
  pressing a key that corresponds to the first character in some entry's name selects that entry. A vertical scrollbar is used for longer lists.
- **JList** provides a scrollable set of items from which one or more may be selected. JList can be populated from an Array or Vector. JList does not
  support scrolling directly, instead, the list must be associated with a scroll pane. The view port used by the scroll pane can also have a user-defined
  border. JList actions are handled using ListSelectionListener.
- <u>**Focus:**</u>- The control under execution is said to have the focus.The control having the focus obtains input from the user.
- <u>**getText():-**</u> getText() method is used to obtain the text from a jTextField during the run time.
- <u>**setText():-**</u> setText(0 method is used to set or change the text of a jTextField during run time.

GUI DIALOGS: -
  A Dialog: It is a small separate window that appears to either provide or request to/from the user.
Java Swing provides four dialog types:
  a) JDialog(General purpose dialogs)
  b) JOptionPane (Pre-defined styles**)**
  c) JFileChooser (dialog for choosing files**) and**
  d) JColorChooser(dialog for choosing colour)
JOptionPane dialog Type:
  There are four built-in dialog styles:
  i.   Message dialog_ **JOption.ShowMessageDialog()** displays the message dialog
  ii. Input dialog_ **JOption.ShowInputDialog()** displays the input dialog
  iii. Confirm dialog_ **JOption.ShowConfirmDialog()** displays the confirm dialog
  iv. Option dialog_ **JOption.ShowOptionDialog()** displays the option dialog

Solved Questions

Q1. Name any two Object Oriented Programming languages?
Ans. C++ and Java

Q2. Why is java called a platform independent language?
Ans. Java program can be easily moved from one computer system to another ,anywhere anytime. Changes and upgrade in operating system, processors and system resources will not force any change in the java program. Hence it is called a platform independent language.

Q3. Why do we write a comment in a program? What are two ways of writing comment in a java program?
Ans. Comments are added to a program for making it more readable and understandable.
 Single line comment : //
Multi –line Comment:- /*-

----------------------*/
Q4. What is a syntax error in context of a program?
Ans. Error in the way of writing a statement in a program, yields a syntax error.

Q5. Name and explain the usage of nay two data types used in java to store numbers with decimals.

Ans. Two data types available in java for storing numbers with decimals are
1. float:-for single precision floating point values for example float num=20.0F

2. double: for double precision floating point value. This is the default data type for decimal numbers for example double num=15.0

Q6. Name and explain the usage of any one relational and one logical operator in java.
Ans. One relational operator in java is = = .This operator results in true if both its operands are equal otherwise false. One logical operator in java is&&.This operator is used to combine two logical values. The result of the && will be true if and only if both its operands (both condition) are true otherwise false.

Q7. What is the difference between = and == operator in java?
Ans. Represent an assignment operator. It sets the value of the variable on its left side with the result of expression on its right side.
= = represents a equality operator. It checks for the equality of both its operands. If both the

operands are equal, condition evaluates to true otherwise to false .

Q8. What is the purpose of break statement in java?
Ans. Break is used to terminate the current switch statement or the loop.

Q9. What is the purpose of continue statement in java?
Ans. Continue statement skips the remaining part of the current loop begins the next iteration of the loop.

Q10. What is the difference between Entry controlled loop and exit controlled loop?
Ans. Entry controlled loop:- In this , condition is tested before entering into the loop, if the test-condition evaluates to true, the loop body executed. The loops belonging to this category are **for loop and while loop.**
Exit Controlled loop:- this loop first executes the loop body and then evaluates the continuation condition. The loop belonging to this category is **do-while loop.** This types of loops are useful when you have to execute the loop body atleast once irrespective of the test-condition's evaluation such as for displaying menu option

Output Finding Questions:

Q.1. Write the output of the following code:
```
int x,y=0;
for(x=1;x<=5;++x)
y=x++;
--y                                            Ans. x=7,y=4
```

Q.2. Write the output of the following code
```
Int f=1,i=2;
do{
f*=I;
}while(++i<5);
System.out.println(f);                         Ans. f= 24
```

Q.3. What will be the value of j and k after execution of the following code:
```
int j=10,k=12;
if(k>=j)
{
k=j;
j=k;
}
```

Q.4. How many times ,the following loop gets executed?
```
 i=0;                                          Ans. j=10,k=10
while(i>20)
{
//statements
}                                              Ans: zero times
```

Q,5, How many times ,the following loop gets executed?
i=0;
do{
//statements
}while(i>20);   Ans. one time

Q.6. What will be the contents of TextField after exec uting the following statement:
int num=4;
num=num+1;
if(num>5)
jTextField1.setText(Integer.toString(num));
else
jTextField1.setText(Integer.toString(num*4));   Ans. 20
Q.7.find the output
int number1=7,number2=8;
int second=73;
if(number1>0||number2>5)
if(number1>7)
jTextField1.setText("code worked");
else
jTextField1.setText("code might work");
else
jTextField1.setText("code will not work   ");   Ans . code
might work
Q.8. How many times will the following loop get executed?
 x=5; y=36;
while(x<=y)
{
x+=6;
}
Q.9. What will be the content of the jTextArea1 after executing the following code?
 int num=1;
do
{
jTextArea1.setText(Integer.to String(++num)+"\n");
num=num+1;
}while(num<=10);   Ans. 10
Q.10. Give the output for the following code fragment:
v=20;
do{
jOptionPane.showMessageDialog(numm,v+"");
}while(v<50);
jOptionPane.showMessageDialog(numm,v+"");   Ans. infinite
loop
Q.11. Give the value after executing following java code.Also find how many times the following
loop will execute?

```
int a=10;
int b=12;
int x=5;
int y=6;
while(a<=b)
{
if(a%2==)
x=x+y;
else
x=x-y;
a=a+1;
}                                                          Ans. x=11
```
Q.12.What will be the output produced by following code fragment?
```
float x=9;
float y=5;
int  z=(int)(x/y);
switch(z)
{
 case 1:x=x+2;
case 2: x=x+3;
default: x=x+1;
}
System,.out.println("value of x:"+x);                       Ans. 15
```

Q.13. Predict the output of the following code fragment:
```
int i,n;
n=0;i=1;
do
{
 n++;i++;
}while(i<=5);                                               Ans. 6
```
Q.13. What will be the values of x and y after executing the following expressions.
```
     int x=20,y=35;
      x= y++ + x++;
      y= ++y + ++x;                           Ans x=56, y=93
```
Q.14. What will be the values of x and y after executing the following expressions.
```
    int y=-1;
    System.out.println("x:"+(-y--));
    System.out.println("y:"+y);
```
**   Ans. x:= -1 ,y=-2**
Q.15. What will be the values of x and y after executing the following expressions.
```
    int x = 45;
    x = x + x++;
System.out.println(x);
 int y = 45;
 y = y++ + y;                           Ans .x=90 , y=91
System.out.println(y);
```

Q.16. What values will be assigned to the variable ua,ub,uc and fail after execution of the following program segment:

```
int i=0,ua=0,ub=0,uc=0,fail=0;
while(i<=5){
switch(i++)
{
case 1:++ua;
case 2:++ub;uc++;break;
case 3;
case 4:++uc;ua++;ub++;break;
default:++fail;
}
```
Ans. ua=1, ub=1, uc=0

Q.17. Predict an output of the following code fragment:

```
   int i=1,j=0,n=0;
while)i<4)
{
for(j=1;j<=I;j++)
{
n+=1;
i=i+1;
}
System.out.println(n);
}
```
Ans. 6

Q..18. Give the output of the following code:

```
int m=100;
while(m>0)
{
if(m<10)
break;
m=m-10;
}
System.out.println("m  is  "+m);
```
Ans. 0

Error Finding Questions:

Q.1. The following cade has some errors. Rewrite the corrected code: Itn

```
  i=2,j=5;
whilej>i
{jTextField1.getText("j is greater"); j--;++
I;
}
JOptionPane.showMessageDialog("Hello"); Q.2.
```

Identify the errors:

```
switch(ch)
{
case 'a': case 'A':
case 'e':
case 'E':
case 'i':
case 'E':
case 'u':
case 'U':++vowels;
break;
```

default:++others;

Ans: Two case constant doesn't have the same value Q.3. int j=5;

i==j+5;

if(i=j)

jTextField1.setText("I and j are equal"); else

jTextField1.settext(" I and j are unequal");

 Ans. int i,j=5;

i=j+5;

if(i==j)

jTextField.setText("I and j are equal"); else

jTextField1.settext(" I and j are unequal");

Q.4. Rewrite the code after making correction. Underline the correction.

Int sum;value;inct;

Int i

For(i==0;i<=10;i++)

Sum=sum+I;

Inct++;

Ans.

int

sum,value,inct;

int i;

for(i=0;i<=10;i++

) sum=sum+i;

inct++;

Q.5. The following code has some error(s).Rewrite the correct code underlining all the corrections made.

Int y=3;

Switch(y)

{

 case 1: System.out.println("yes its one");

case >2: System.out.println("yes it is more than tw o"); break;

case else: System.out.println("invalid number"); Ans. int y=3;

switch(y)

{

case 1 : System.out.println("yes its one"); break;

case 2: System.out.println("yes its more than two")

break;
default: System.out.println("invalid number");
}

Q.6. Rewrite the following java code after underlining the correction made:
int x==0;
int n=Integer.parseInt(jLabel1.getText());
Ans. int x=0;
int n=Integer.parseInt(jLabel1.getText());

Q.7. find out errors if any:
M=1;n=0;
For(;m+n<19;++n)
System.out.println("hello");
M=m+10;
Ans. m=1;n=0;
for(;m+n<19;++n)
System.out.println("hello"
); m=m+10;

Q.8. The following code has some error(s).Rewrite the correct code underlining all the corrections made.
int y=6,p;
Do
{
y=3.14*y;
p=y%10;
If p=2
System.out.print("two");
While(y>1)
Ans.int
y=6,p; do
{
y=3.14*y;
p=y%10
; if(
p==2)
System.out.print("two");
}while(y>1);

Rewrite Questions

Q.1. Rewrite the following program code using a for loop:
    int I,sum=0;
while(I<10)
{
sum+= I ;
I+=2;
}
Ans.
int I,sum=0;

```
for(I=0;I<10; I+=2)
{
Sum+=I;
}
```

Q.2. rewrite the following code using while loop:

```
int i,j;
for(i=1;i<=4;i++)
{
for(j=1;j<=I;++j)
System.out.print(j);
}
System.out.println();
}
```

Ans.
```
int i=1.j;
while(i<=4)
{
J=1;
while(j<=i)
{
System.out.print(j);
++j;
}
i++;
System.out.prinln();
}
```

Q.3. Write a equivalent while loop for the following code:

```
int sz=25;
for(int i=0,sum=0;i<sz;i++)
sum+=I;
System.out.println(sum);
```

Ans. int sz=25;
```
int
i=0,sum=0;
while(i<sz)
{
sum+=i;
i++;
}
System.out.println(sum);
```

Q.4.Rewrite the following if-else segment using switch –case statement

```
char ch='A';
if(ch=='A')
System,out.println("Account");
if((ch=='C')||(ch=='G'))
System.out.println("Admin");
if(ch=='F')
System.out.println("advisor");
```

Ans. char
ch='A';
switch(ch)
{
case
'A':System.out.println("account");
break;
case 'C':
case 'G':
System.out.println("admin");
break;
case 'F': System.out.println("advisor");
}
Q..5. Rewrite the following code using while loop
int i, j;
for(i=1,j=2;i<=6;i++,j+=2)
System.out.println(i++);
System.out.println("finished!!!");
Ans.
int i=1,j=2;
while (i<=6)
{
System.out.println(i++);
i++;
j+=2;
}
System.out.println("finished!!!");
Q.6. Rewrite the following code using for loop.
int i=0;
while(++i<20)
{
if(i==8)
break;
System.out.println(i++);
}
Ans. int i;
for(i=1;i<20;++i
) { if(i==8)
break;
System.out.println(i++);
}
Q.7.Rewrite the code using switch statement:
if(k==1)
day="Monday";
else if(k==2)
day="Tuesday";
else if (k==3)
day="Wednesday";
else day="-";
}

Ans. switch(k)
{
case
1:day="Monday";
break;
case 2"day="Tuesday";
break;
case 3 :day="Wednesday";
break;
default: day= " " ;
}

JAVA GUI PROGRAMMING REVISION TOUR-II

Solved Question
Some Important Questions with Answers
1. Which window is used to design the form Ans. Design Window
2. Which window contains the Swing Controls components? Ans. Palette window
3. What is the most suitable component to accept multiline text. Ans. TextArea
4. Name the different list types controls offered by Java Swing. Ans. (i) jListBox (ii)jComboBox
5. Name any two commonly used method of ListBox. Ans. (i)getSelectedIndex() (ii)getSelectedValue()
6. By default a combo box does not offer editing feature. How would you make a combo box editable.
Ans. By setting its editable property to true.
7. What is the name of event listener interface for action events? Ans.ActionPerformed
8. What is the difference between a Container and Component control?
Ans. A container is a control that can hold other controls within it.
E.g. Panel(there can be multiple controls inside Panel, Frame(where you can put so many controls on it.) Component: Controls inside the container are known as container
9. Differentiate between
   (a)   TextField and TextArea components
   (b)   TextField and PasswordField
   (c)   Combo box and list box
   (a)   Ans. The TextField allows the user to enter a single line of text only. But Text Area component allows to accepts multiline input from the user or display multiple lines of information.
   (b)   Textfield displays the obtained text in unencrypted form whereas password field displays the obtained text in encrypted form. This component allows confidential input like passwords

(c)   List box :- In the list box,the users can only select from the list of choices, but in combobox a user can select from the list of choices as well as enter his/her choice(combobox=listbox+textfield)

10. Why are data types important?

Ans. Data Types define the way the values are stored, the range of the values and the operations that are associated with that type.

11. What is a variable?

Ans. Variable is named temporary storage locations. 12. What is an identifier?

Ans. Identifiers are fundamental building block of a program and are used as the general terminology for the names given to different parts of the program .

13. What is casting? When do we need it?

Ans. Assigning a value of one type to the variable of another type is known as type casting int x=10;
byte y= (byte) x;

14. Is Java case sensitive? What is meant by case sensitive?

Ans. Yes, java is case sensitive. Case sensitive means upper case and lower case letters are treated differently.

15. What does getPassword() on a password field return? Ans. A character array.

16. Which component is the best suited to accept the country of the user? Ans.. ListBox and ComboBox both

17. What command do you need to write in actionPerformed() event handler of a button I order to make it Exit button?

Ans. System.exit(0);

18. Which control displays text that the user cannot directly change or edit? Ans. Label

19. Which control provides basic text editing facility?

Ans. TextField

20. Occurrence of an activity is called. Ans. Event

21. Which property is used to set the text of the label? Ans. Text

22. The object containing the data to be exhibited by the combo box by which property Ans. Model

23. What is GUI programming?

Ans. We can create a GUI application on Java platform using Swing API ,which is part of java foundation classes (JFC).

24.   What is an event? What is event handler, source, object?

Ans. An event is occurrence of some activities either initiated by user or by the system. In order to react, you need to implement some event handling system in your application.

Event source:-It is the GUI component that generates the event eg. Button
Event Handler or Event Listener:- It is implemented as in the form of code .It receives and handles events through listener interface.
Event object or message:- It is created when event occurs. It contains all the information about the event which includes source of event and type of even etc.

25. Which property would you set the setting the password character as $? Ans. echoChar

26. Which method returns the password entered in a password field? Ans. getPassword( )

27. Which method would you determine the index of selected item in a list? Ans. getSelectedIndex(int Index)

28. Which method would you use to insert an item at specified index, in the list? Ans. setSelectedIndex(4)

29. How you can determine whether 5th item in a list is selected or not? Ans. isSelectedIndex(4)

30. Which method you would use to insert "hello" at 10th position in the TextArea control.

Ans. insert("hello",9)   //index st arts from zero

31. Which property would you like to set to make a combo box editable? Ans. Editable

32. What do you understand by focus.

Ans. A Focus is the ability to receive user input/response through Mouse/Keyboard .When object or control has focus, it can receive input from user.

    a) An object or control can receive focus only if its enabled and visible property are set to true.

    b) Most of the controls provide FOCUS_GAINED( ) and FOCUS_LOST( ) method

33. What is meant by scope of a variable ?

Ans. In java ,a variable can be declared anywhere in the program but before using them. 1.The area of program within which a variable is accessible , known as its scope. 2.A variable can be accessed within the block where it is declared

```
{
int x=10;
if(a>b)
{
int y=5;
//scope of x and y
}
else
{
int z=3;
//scope of z
}                                    }
```
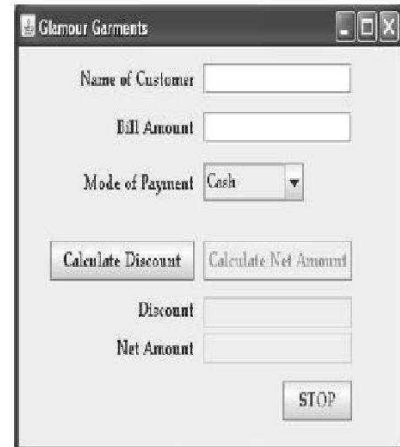
DESIGN PROBLEMS

Q1.

Glamour Garments has developed a GUI application for their company as shown below :

The company accepts payments in 3 modes- cheque , cash and credit cards.The discount given as per mode of payment is as follows.

Mode of Payment	Discount
Cash	8%
Cheque	7%
Credit Card	Nil

If the Bill Amount is more than 15000 then the customer gets an additional discount of 10% on Bill Amount.

(1) Make Discount and Net amount uneditable.
   (2) Write codes for calculate Discount and calculate Net Amount Buttons
   (3) Write code to exit program when STOP button is clicked.

Solution:

(1)
```
txtDiscount.setEditable(false);
txtNetAmt.setEditable(false);
(2)
//Code for calculate button

 String name= txtname.getText();

double bm=Double.parseDouble(txtbillamt.getText(););
double disc=0.0, netAmt=0.0;

String s= cmbMode.getSelectedItem();
if(s.equals("Cash"))
{
       disc= 0.08*bm;
}
else if(s.equals("Cheque"))
{
       disc=0.07*bm;
```

```
}
else if(s.equals("Cash"))
{
        disc=0;
}
netAmt=bm-disc; txtDiscount.setText(" "+disc); txtN etAmt.setText(" "+netAmt);
(3)
//code for stop button

System.exit(0);
```

2. Create a Java Desktop Application to find the incentive (%) of Sales for a Sales Person on the basis of following feedbacks:

Feedback	Incentive (%)
Maximum Sales	10
Excellent Customer Feedback	8
Maximum Count Customer	5

Note: that the sales entry should not be space. Calculate the total incentive as:
Sales amount* Incentive.
The feedback will be implemented in JCheckBox controls. Using a JButton's (Compute Incentive) click event handler, display the total incentives in a JTextField control. Assume the nomenclature of the swing components of your own.

Note that the JFrame from IDE window will be shown as given:
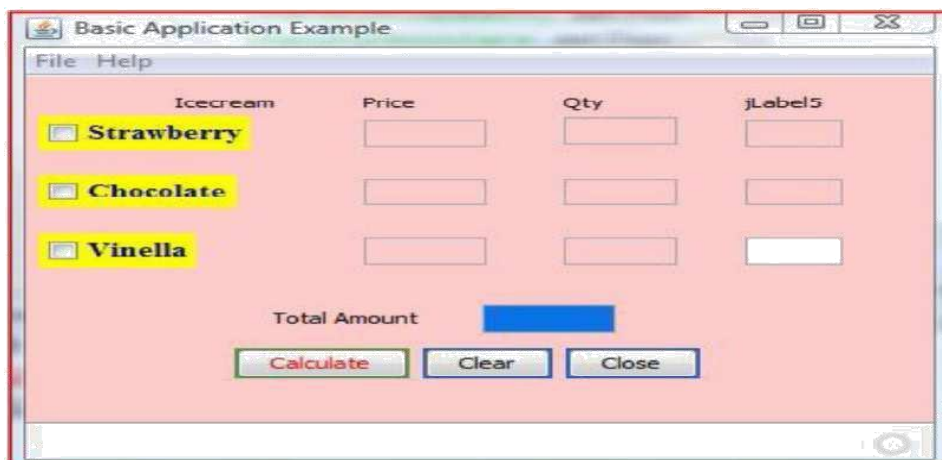
Ans:- private void btnIncActionPerformed (java.awt.ActionEvent evt)
```
{
                int sales = 0;
                if (! txtSales.getText( ).trim( ).equals( ""))
                {
                        sales-Integer.parseInt(txtSales.getText( ).trim ( ));
                }
                double incentive = 0.0;
                if (jCheckBox1.isSelected ( ))
                {
                        incentive = incentive + 0.1;
                }
                if (jCheckBox2.isSelected ( ))
                {
                        incentive = incentive + 0.8;
                }
                if (jCheckBox3.isSelected ( ))
                {
                        incentive = incentive + 0.05;
                }
                txtInc.setText ( " " + Math.round(sales * incentive ));

}
```

3. Assume the following interface built using Netbeans used for bill calculation of a ice-cream parlor. The parlor offers three verities of ice-cream – vanilla, strawberry, chocolate. Vanilla icecream costs Rs. 30, Strawberry Rs. 35 and Chocolate Rs. 50. A customer can chose one or more ice-creams, with quantities more than one for each of the variety chosen. To calculate the bill parlor manager selects the appropriate check boxes according to the verities of ice-cream chosen by the customer and enter their respective quantities.

Write Java code for the following:

a. On the click event of the button 'Calculate', the a pplication finds and displays the total bill of the customer. It first displays the rate of various ice-creams in the respective text fields. If a user doesn't select a check box, the respective ice -cream rate must become zero. The bill is calculated by multiplying the various quantities with their respective rate and later adding them all.

b. On the Click event of the clear button all the text fields and the check boxes get cleared.

c. On the click event of the close button the application gets closed.

Ans: (a)
```java
private void jBtncalculateActionPerformed(java.awt.event.ActionEvent evt)
{
        if(jchkStrawberry.isSelected()==true)
                jTxtPriceStrawberry.setText("35");
        else
        {
                jTxtPriceStrawberry.setText("0");
                jTxtQtyStrawberry.setText("0");
        }
        if(jChkChocolate.isSelected()==true)
                jTxtPriceChocolate.setText("50");
        else
        {
                jTxtPriceChocolate.setText("0");
                jTxtQtyChocolate.setText("0");
        }
        if(jChkVinella.isSelected()==true)
                jtxtPriceVinella.setText("30");
        else
        {
                jtxtPriceVinella.setText("0");
                jTxtQtyVinella.setText("0");
        }
        int r1,r2,r3,q1,q2,q3,a1,a2,a3,gt;
        r1=Integer.parseInt(jTxtPriceStrawberry.getText());
        r2=Integer.parseInt(jTxtPriceChocolate.getText());
        r3=Integer.parseInt(jtxtPriceVinella.getText());
        q1=Integer.parseInt(jTxtQtyStrawberry.getText());
        q2=Integer.parseInt(jTxtQtyChocolate.getText());
        q3=Integer.parseInt(jTxtQtyVinella.getText());
        a1=r1*q1;
        jTxtAmtStrawberry.setText(""+a1);
        a2=r2*q2;
        jTxtAmtChocolate.setText(""+a2);
        a3=r3*q3;
        jTxtAmtVinella.setText(""+a3);
        gt=a1+a2+a3;
        jTxtTotalAmt.setText(""+gt);
}
```

Ans.(b)
```java
private void jBtnClearActionPerformed(java.awt.event.ActionEvent evt)
{
        jTxtPriceStrawberry.setText("");
        jTxtPriceChocolate.setText("");
        jtxtPriceVinella.setText("");
        jTxtQtyStrawberry.setText("");
        jTxtQtyChocolate.setText("");
        jTxtQtyVinella.setText("");
        jTxtAmtStrawberry.setText("");
        jTxtAmtChocolate.setText("");
        jTxtAmtVinella.setText("");
        jchkStrawberry.setSelected(false);
        jChkChocolate.setSelected(false);
```

```
        jChkVinella.setSelected(false);
}
```

Ans: (c)
```
private void jBtncloseActionPerformed(java.awt.event.ActionEvent evt)
{
        System.exit(0);

}
```
4. Read the following case study and answer the questions that follow.
   TeachWell Public School wants to computerize the employee salary section.

      The School is having two categories of employees : Teaching and Non Teaching. The
      Teaching employees are further categorized into PGTs, TGTs and PRTs having different
      Basic salary.
      The School gives addition pay of 3000 for employees who are working for more than 10
      years.

Employee Type	Basic Salary	DA (% of Basic Sal)	HRA (% of Basic Sal)	Deductions (% of Basic sal)
Non-Teaching	25001	31	30	12
PGT	14500	30	30	12
TGT	12500	21	30	12
PRT	11500	20	25	12

(a) Write the code to calculate the Basic salary, deductions, gross salary and net salary based on the given specification. Add 3000 to net salary if employee is working for more than 10 years.
       Gross salary=Basic salary + DA + HRA
       Net salary = Gross salary – deductions
(b)Write the code to exit the application.
(c)Write the code to disable textfields for gross salary, deductions and netsalary.
Ans: (a)

```
double bs=0,da=0,net=0,ded=0,gross=0,hra=0; if
(rdnon.isSelected()==true)
{
        bs=12500;
        da=(31*bs)/100;
        hra=(30*bs)/100;
        ded=(12*bs)/100;
}
```

```java
else if (rdpgt.isSelected()==true)
{
        bs=14500;
        da=(30*bs)/100;
        hra=(30*bs)/100;
        ded=(12*bs)/100;
}
else if (rdtgt.isSelected()==true)
{
        bs=12500;
        da=(21*bs)/100;
        hra=(30*bs)/100;
        ded=(12*bs)/100;
}
else if (rdprt.isSelected()==true)
{
        bs=11500;
        da=(20*bs)/100;
        hra=(25*bs)/100;
        ded=(12*bs)/100;
}
gross=bs+da+hra;
net = gross – ded;
if(chk10.isSelected()==true)
{
        net=net+3000;
}
tfded.setText(" "+ded);
tfgross.setText(" "+gross);
tfnet.setText(" "+net);
tfbs.setText(" "+bs);
```

Ans:(b)
```java
        System.exit(0);
```
Ans:(c)
```java
        tfgross.setEditable(false);
        tfded.setEditable(false);
        tfnet.setEditable(false);
```

5. ABC School uses the following interface built in java to check the eligibility of a student for a particular stream from science, commerce and humanities. The user first enters the total percentage and selects the desired stream by selecting the appropriate option button. An additional 5% is marks is given to students of NCC. Write Java Code for the following

    a. On Action event of the button 'Calc Percentage' Net percentage of the student is calculated and displayed in the appropriate text filed. Net percentage is same as that of the actual percentage if the student doesn't opts for NCC otherwise 5% is added to actual percentage.

    b. On Action event of the button 'Result', the applica tion checks the eligibility of the students. And display result in the appropriate text field. Minimum percentage for science is 70, 60 for commerce and 40 for humanities.

    c. On the Click event of the clear button all the text fields and the check boxes get cleared.

    d. On the click event of the close button the application gets closed.
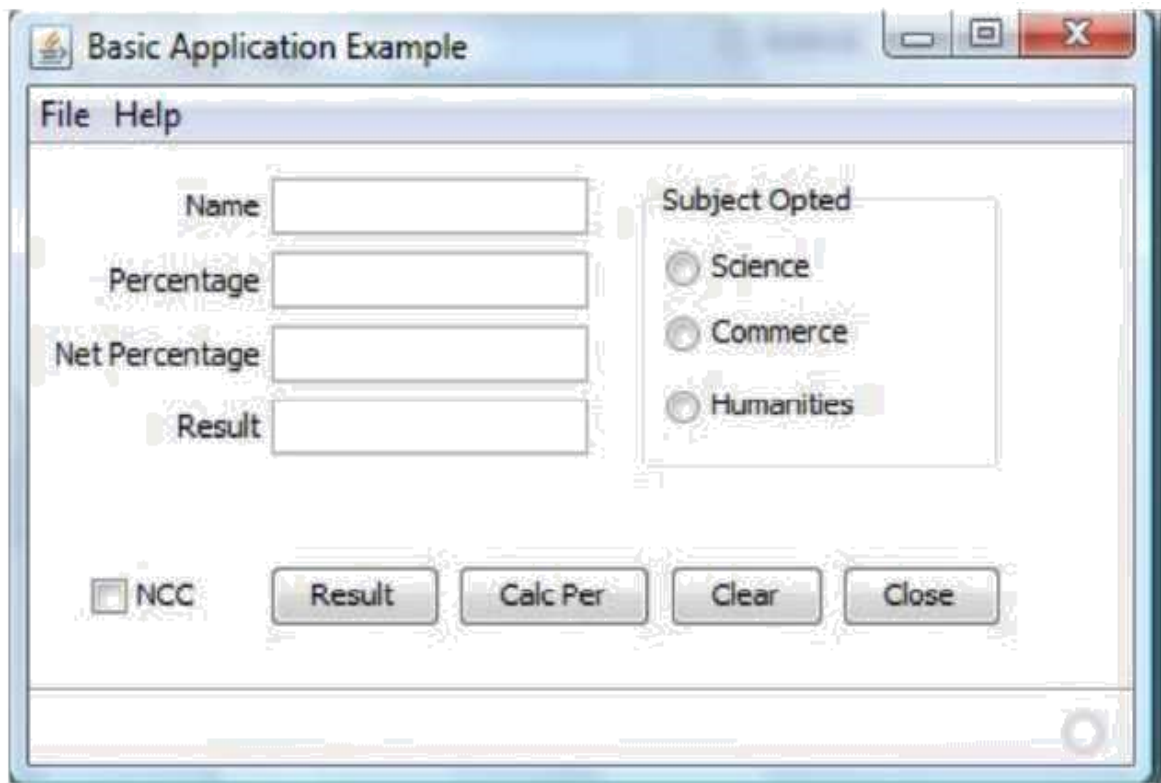
Ans:

a.
```
private void jBtnCalcPerActionPerformed(java.awt.event.ActionEvent evt)
{
        int p; p=Integer.parseInt(jTextField2.getText());
if (jCheckBox1.isSelected()) p=p+5;
        jTextField3.setText(Integer.toString(p));
}
```

b.
```
private void jBtnResultActionPerformed(java.awt.event.ActionEvent evt)
{
        int p; p=Integer.parseInt(jTextField3.getText()); if(
        jRadioButton1.isSelected())
        {
                if ( p>=70)
                        jTextField4.setText("Eligible for all subject");
                else
                        jTextfield4.setText("Not Eligible for science");
        }

        else if( jRadioButton2.isSelected())
        {
                if ( p>=60 )
                        jTextField4.setText("Eligible for Commerce and Huma nities");
                else
                        jTextfield4.setText("Not Eligible for Science and C ommerce");
        }
        else
        {
                if ( p>=40 )
                        jTextField4.setText("Eligible for Humanities");
                else
```

jTextfield4.setText("Not Eligible for any subject ");
        }
}

c.
private void jBtnClearActionPerformed(java.awt.event.ActionEvent evt)
{
        jTextField1.setText("   ")   OR   jTextField1.setText(nul   l)
        jTextField1.setText("   ")   OR   jTextField1.setText(nul   l)
        jTextField1.setText("   ")   OR   jTextField1.setText(nul   l)
        jTextField1.setText("   ")   OR   jTextField1.setText(nul   l)
        jCheckbox1.setSelected(false);
}

d.
private void jBtnCloseActionPerformed(java.awt.event.ActionEvent evt)
{
        System.exit(0);
}

Credit Card Type	Shopping Amount	Discount
Cash	< 10000 20 %	20 %
	>= 10000 25 %	25%
Cheque	< 15000	10 %
	>= 15000	15 %
Credit Card	< 10000	10 %
	>= 10000	12%

a) Write the code for the CmdClear Button to clear all the Text Fields.

b) Write the code for the CmdCalc Button to display the Discount Amount and Net Price in the TxtDisc and the TxtNet Text Fields respectively.

JAVA GUI PROGRAMMING REVISON TOUR –III

What is an object?

An object is an identifiable entity with some characteristics and behavior.

"Yourself are also an example of object. Your uniq ue identity is your name. Your characteristics are: you have eyes, nose, ears, hands ,legs, heart, brain etc.
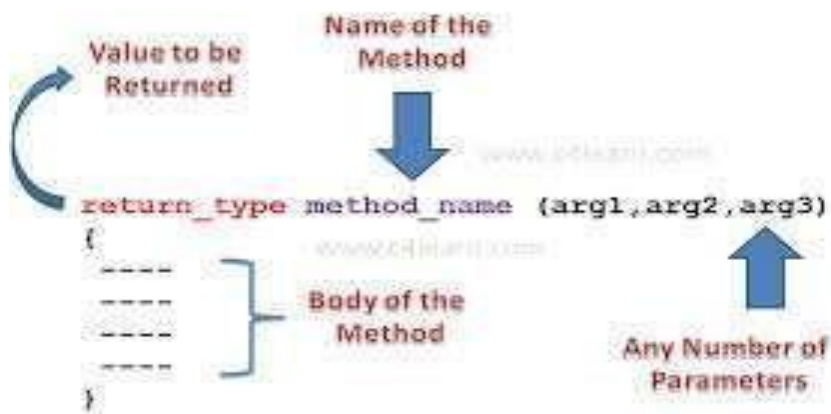
Your behavior is :" you can walk, talk, eat ,sleep, sing, dance. etc

Class:- A class is a blueprint that represents a set of similar objects.
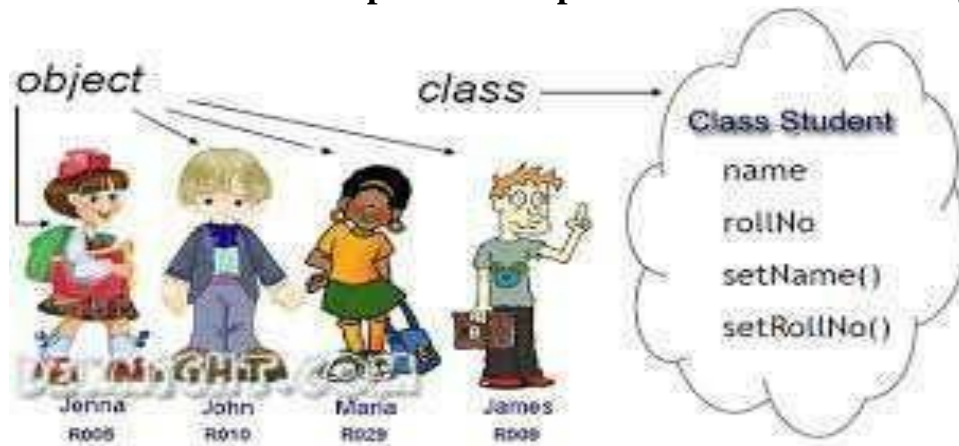
Methods:-The behavior of an object is described through associated functions called methods.

Defining method

Solved Questions

Q1. What do you understand by Class and Object?

Ans. The basic unit of OOP is the Class .It can be described as a blue print of objects .In other words, an object is an instance of a class. A java program may have various class definitions.

An object is an entity having a unique identity ,characteristics(properties) and behavior (methods).

Q2. How to declare a class in java?

Ans. In java a class is declared /defined by using class keyword followed by a class name.

For example: public class

student

{

String Name; int

rollno; String

fname; String DOB;

void getAdmission( )

{

……………

………………..
}
void getTransfer( )
{………………..
…………………
}
void feeDeposit( )
{
……………..
……………
}
Q3. What is the difference between instance and static variable?
Ans. Instance Variable:- These data member are created for every object of the class i.e. replicated with objects.
Class Variable(Static):- These data members that is declared once for each class and all objects share these members. Only a single copy is maintained in the memory. These are declared with static keyword.

Q4. What do you understand by methods? What are the advantages of methods?
Ans. A method or function is sequence of statement which are written to perform a specific job in the application. In object oriented Programming, Method represents the behavior of the object. A message can be thought as a call to an object's method. The following three advantages/reasons describes that why we use methods.

To cope with complexity:
When programs become more complex and big in size, it is best technique to follows "Divide and Conquer". i.e. a complex problem is broken in to sm aller and easier task.,so that we can make it manageable.

Hiding details:
Once a method is defined, it works like a Black-Board and can be used when required without concerning that "How it Works?"

Reusability of code:
Once a method is implemented, it can be invoked or called from anywhere in the program when needed i.e. Method can be reused. Even a packaged method may be used in multiple applications. This saves our time and effort.

Access Specifier for Class Members:
The access specifiers control access to members of class from/within java Program .Java supports various Access Specifiers to control the accessibility of class members.

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

Protected: Protected members can be accessed by the class members and subclasses(derived classes) and current package, but they are not accessible from beyond package or outside. **Public**:-Class members declared as public are accessible to any other class i.e. everywhere, since they are public.

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

Private Access Specifier:-
Members declared as private are accessible by the members of the same class, since they are private.
A private key word is used to specify. class
abc{
private int p;
private void method1()
{
P=10;
System.out.print(" I am private method");
}
}

```
class xyz
{
…
void method2()
{
 abc x=new abc();
x.p=10; x.method1();
}
}
```

Protected Access Specifier

Protected members are accessible by all the classes in the same package and subclasses (same or different package).A protected keyword is used to specify.

```
package mypackage; class
abc
{
protected int p;
protected void method1()
{
p=10;
System.out.print("protected method");
}
}
class xyz
{…………..
void method2()
{ abc x=new abc();
x.p=10; xmethod1();}
}
```

Lets another package..

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

Public Access Specifier

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

```
package mypackage; class
abc
{
public int p;
public void method1()
{
p=10;
System.out.print("public method");
}
}
package ourpackage; import
```

mypackage.*; class xyz
{..........
void method2()
{
abc x=new abc();
x.p=10; x.method1();
}
}

Package (friendly) access specifier

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

package mypackage; class
abc
{
int p;
void method1()
{
p=10;
System.out.print("package method");
}
}
class xyz {..................

void method2()
{
 abc x=new abc();
x.p=10; x.method1();
}
}

MORE ABOUT CLASSES AND LIBRARIES:-

A set of ready-made software routines that can reused in new programs, is called in new programs, is called a Library.

String Library:
1. **Concat():-** This method appends one String to the end of another. The method returns a String with the value of the String passed in to the method appended to the end of the String used to invoke this method.

    Syntax: String concat(String s)

```
    String s = "Strings are immutable"; s =
    s.concat(" all the time");
    System.out.println(s);
  }
```
This produces the following result:
Strings are immutable all the time

2. Length(): It returns the number of characters contained in the string.

```
String palindrome = "Dot saw I was Tod"; int len
= palindrome.length();
System.out.println( "String Length is : " + len );
```

This would produce the following result

String Length is : 17

3. toLowerCase(): It returns the String, converted to lowercase.

```
String Str = new String("Welcome to KVS");
System.out.print("Return Value :");
System.out.println(Str.toLowerCase());
```

This produces the following result:

Return Value :welcome to kvs

4. toUpperCase:-It returns the String, converted to uppercase.

```
String Str = new String("Welcome to kvs");

System.out.print("Return Value :" );

System.out.println(Str.toUpperCase() );
```

This produces the following result:

Return Value :WELCOME TO KVS

5. **Trim():** It returns a copy of this string with leading and trailing white space removed, or this string if it has no leading or trailing white space.

```
String Str = new String(" Welcome to kvs ");
System.out.print("Return Value :" );
System.out.println(Str.trim() );
```

This produces the following result:

Return Value :Welcome to kvs

6. **SubString() :** This method returns a new string that is a substring of other string. The substring begins with the character at the specified index and extends to the end of this string or up to endIndex,- 1 if second argument is given.

```
public String substring(int beginIndex)
public String substring(int beginIndex, int endIndex)
```
- **beginIndex** -- the begin index, inclusive.
- **endIndex** -- the end index, exclusive.

```
String Str = new String("Welcome to KENDRIYA VIDYALAYA SECTOR-22 ROHINI");
System.out.print("Return Value :" );
```

```
        System.out.println(Str.substring(11) );
        System.out.print("Return Value :" );
        System.out.println(Str.substring(11, 15) );
    }
```

This produces the following result:

```
Return Value : KENDRIYA VIDYALAYA SECTOR-22 ROHINI
Return Value : KENDR
```

7. **toString():-**This method returns itself a string

```
public String toString()

        String Str = new String("Welcome to our Nation");
        System.out.print("Return Value :");
        System.out.println(Str.toString());
    }
}
```

This produces the following result:

```
Return Value :Welcome to our Nation
```

Math Library Function

1. **pow():** To compute something in the form a^b where a and b are numbers, you can use pow() method of math Library i.e. Math.pow()

    math.pow(a,b) math.pow(2,4)

    returns 16

2. **round()** :- To round off a number to its nearest integer, you can use round() method of math library i.e math.round( ).

    math.round(1.5) returns 2

    math.round(-1.5) returns -1

INHERITANCE :-
Inheritance is a act of deriving a new class from an existing one. Inheritance can be defined as the process where one object acquires the properties of another. With the use of inheritance the information is made manageable in a hierarchical order..
Basics of inheritance
When a class is defined in normal class declaration, it is called a base class. A class at the top of the hierarchy is the base class and the other class is the derived class. That is a child class o one parent can itself be the parent of another derived class. Furthermore, multiple classes can be derived from a single parent..
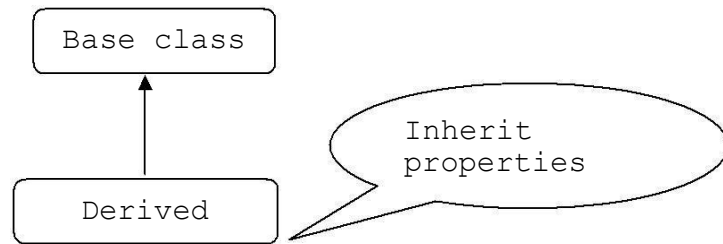
Types of inheritance
1. Single inheritance
2. Multilevel
3. hierarchical

1) Single

2) Multilevel

3) Hierarchical
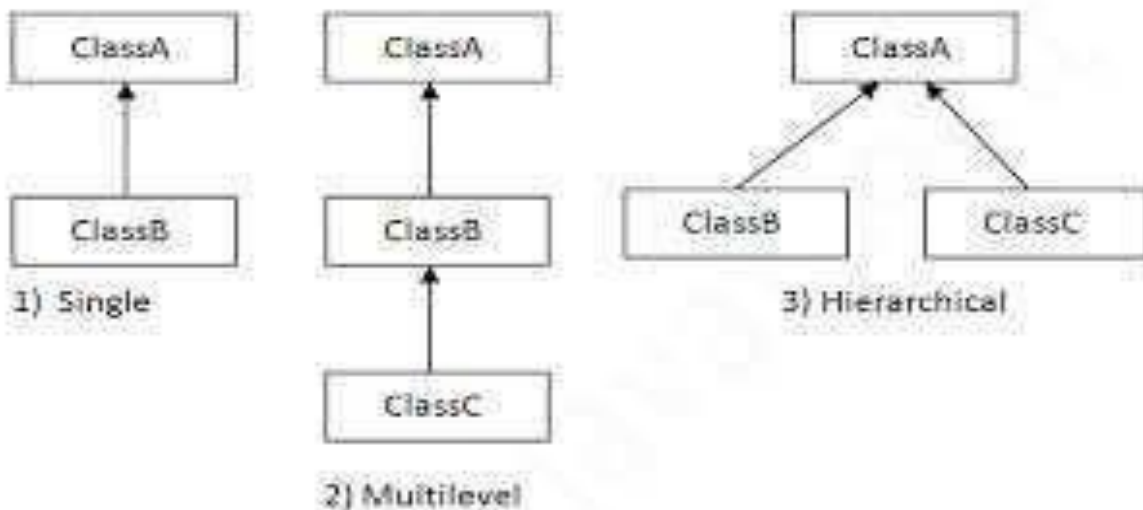
Declaring derived class:

A derived class inheritance data members and member functions from its base class. However a derived class does not inherit any constructor and destructor. A derived class may itself be a base class from which additional classes could be derived. for eg.

A inherits properties from the base class at the top level. Derived class B inherits those properties plus any new ones in class A. Derived class C inherits properties from the top base class and from derived class A and B.

Base Class e.g.
```
class baseclass
{
    private int counter; public
    baseclass()
     {
        counter=0; }
    void newset(int n)   //member function of base class
    {
        counter=n;
    }
void factorial(void);
}
```

Child class

```
class childclass extends baseclass
{
public childclass()
{
}
void changecounter(int n)
{
newest(n);
factorial();
}
}
```

DEMONSTRATING INHERITANCE

```
class baseclass
{
int counter;
baseclass(){
counter=0;
}
public  void factorial()

{
int i=1;
double fact=1.0;
for(i=1;i<=counter;i++)
fact=fact*i;
Txtfact.setText(Double.toString(fact));
}
}
class childclass  extends baseclass
{
 void changeval(int n)
{
 counter=n;
}
}
```

Enter the number to find factorial	
Factorial is	
factorialal	exit

On double click of factorial button
int n= Integer.parseInt(txtnum.getText());
Childclass obj1=new childclass();
Obj1.changeval(n);
Obj1.factorial();

Solved Questions :

1. What do you understand about inheritance? Write the advantages of inheritance.
Ans. Inheritance is a form of software reusability in which new classes are created form
existing classes by absorbing their attributes and behaviors and overriding these with
capabilities ,the new classes require.

The advantage is that, when creating a new class, instead of writing completely new data
members and members functions, the programmer can designate that the new class is to inherit
the data members and member function of a previously defined base class. The new class is
referred to as a derived class.

2.   Describe the relationship between a parent class and a child class
Ans. A child class is derived from a parent class using inheritance. The methods and a variables
of the parent automatically become a part of the child class to the rules of the visibility
modifiers used to declare them.

3.   How does inheritance support software reuse?

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

JAVA DATABASE CONNECTIVITY TO MYSQL:-

Important points

1. Classes used for Database Connectivity

    (a) Driver Manager Class

    (b) Connection Class

    (c) Statement Class

    (d) Resultset Class

2. Prerequisites for connecting to MYSQL from java

    MYSQL provides connectivity for client application developed in the java programming

    language via a JDBC driver known as MYSQL Connector/J.

3. Connection: A connection is the session between the application program and the database.

    To do anything with database, one must have a connection object.

4. Connecting to MYSQL from Java:

    Steps for creating Database Connectivity Application

    There are mainly six steps:-

    Step 1:- Import the packages required for database programming.

    Step 2:- Register the JDBC Driver.

    Step 3:- Open a connection

    Step 4:- Execute a Query

    Step 5:- Extract Data from resultSet.

    Step 6:- Clean up the Environment.

    Now to connect to a database, you need to know database's complete URL, the user's ID

    and password:-

    Jdbc:mysql://localhost/<database-name>?user="userna me"&password="password"

    Result Set Methods

    A result set(represented by a rEsult Set object) refers to a logical set records that are fetched

    from the database by executing a query and made available to the application

    program. There are various resultset methods such as:-

    1. next() :-moves the cursor forward on row.

    2. first ( ):- Moves the cursor to the first row in the resultset object.

    3. last ( ):- Moves the cursor to the last row in the resultset object.

4. relative(in rows):- moves the cursor relative to its current position.

5. absolute (int r-no):- moves the cursor on the r-noth row of the resultset object.

6. getRow( ):- retrieves the current row number the cursor is pointing at. If cursor is at first row the getRow() will return 1.

Solved Questions

Q1. What is the importance of java.sql.*; in java jdbc connection?

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

Q2. What is Driver Manager?

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

Q.3 What is the purpose of connection.close() method?

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

Q4. Name the four component of JDBC?

Ans. JDBC consist of four component: The JDBC API, JDBC Driver Manager, JDBC Test Suite and JDBC-ODBC bridge.

Q5. What is resultset?

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

Q6 What type of parameter that used in executeQuery() method?

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

Q7. What is connection? What is its role?

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

Q8. Name the methods which are useful for executing SQL statements.

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

a. executeQuery():-For sql statements that produce a single result set

b. executeUpdate():- for executing INSERT,UPDATE or DELETE statements and also SQL DDL (Data Definition language) statements

WEB APPLICATION DEVELOPMENT:-

Brief Summary of the Chapter:
World Wide Web is an example of an information protocol/service that can be used to send and receive information over the internet. It supports:
Multimedia Information
Hyper Text Information
3. Graphical User Interface
The World Wide Web is an example of an information protocol/service that works using a Client/Server software design. A service that uses Client/Server design requires two pieces of software to work:
Client software (e.g. Web Browser) to request information, and
Server software(Web server) to answer requests and provide their information. Most Web applications are designed this way.

Key Points of the Chapter:
URL(Uniform Resource Locator): The uniform resource locator (URL) is the unique identifier of a web page.

Protocol : A standard set of regulations and requirements that allow two electronic items to connect to and exchange information with one another. Protocols regulate data transmission among devices as well as within a network of linked devices. E.g HTTP

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

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

Client Server Computing: It refers to a network set-up in which programs and information reside on the server and clients connect to the server for network access.

Dynamic Web Page: A dynamic document is created by web server whenever a browser requests the documents.

Static Web Page: A static document is a fixed content document that is created by web server whenever a browser requests the documents.

HTML-I : BASIC HTML ELEMENTS:-

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

Key Points of the Chapter:
- HTML stands for Hyper Mark-up Language.
- HTML is the subset of SGML (Standard Generalised Markup Language)
- The head of the HTML document is where you enter the title of the page.
- Headings are typically displayed in larger and/or bolder fonts than normal body text. HTML has six levels of heading, numbered 1 to 6, with 1 being the largest.
- The BACKGROUND is the image attribute in <BODY> tag where you can place graphic object to make more attractive Web page.
- The BGCOLOR attribute is used to set the background color of your Web page with <BODY> tag.
- <HR> is used as a section separator and attributes used in it are width and size to specify width and height of the line
-
 is used for line break in the page
- <P> tag is used to specify a paragraph body
- The <IMG SRC> tag specifies an image to be displayed in a Web page. This is an empty element, which is coded in HTML document. It has attributes like : SRC, ALIGN, BORDER, HEIGHT, WIDTH and ALT.
     e.g. <img src="Photo.jpg" align="center" border=" 2">
- Links between Web pages is known as hyperlink.
- The anchor tag <A> marks the text as hypertext link.
- The HREF attribute specifies the destination of a link.
- The HREF or the name attribute must be present in the <A> tag.
- HREF is an attribute for the <A> tag, which is displayed in a browser, the work Text describing link would appear underlined and in another order to indicate that clicking that text initiates the hypertext link.

e.g.

    <A href=" www.kvssangathan.nic.in "> Open KVS Sangathan's website
    </A> Or
    <A href="myphoto.jpg"> Click to see my photo</A>

Tags are not case sensitive

HTML-II :LISTS, TABLES AND FORMS:-

Key Points of the Chapter:
Lists
The numbered/ordered list <OL> tag is used to indicate a list item as contained in an ordered or numbered form.

e.g.
1. Keyboard
2. Mouse
3. CPU

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

e.g.
o Keyboard
o Mouse
o CPU

<LI> list tag is used to denote the beginning of each new list item.

* The TYPE attribute is used to change the bulleted symbol in a list. The attribute may have a value of circle, disc, or square. For example, <UL TYPE=disk>.
* The list items are marked with bullets (typically small black circles).
* The START attribute is used to change the beginning value of an ordered list. Normally, the ordered list starts with 1. For example, <OL START = A>

Table
A table is divided into rows (with the <tr> tag), and each row is divided into data cells (with the <td> tag). The letters td stands for "table data", which is the content of a data cell.

<Table> </Table> is used to specify that Table is to be created

Attributes which may be used in Table tag are **_Border, Align, Background, Bgcolor, Height, Width etc._**

<TR> </TR> is used to specify that table row is specified

<TD> </TD> is used to specify columns of the table by specifying Table Data.

e.g.

Source Code	Result
```<!-- Codes by HTML.am --><table border="1"><tr><th>Table Header</th><th>Table Header</th></tr><tr>```	Table Header Table Header / Table cell 1 Table cell 2 / Table cell 3 Table cell 4

COLSPAN and ROWSPAN
Table cells can span across more than one column or row. The attributes COLSPAN ("how many across") and ROWSPAN ("how many down") indicate how many columns or rows a cell should take up.

For example, we might want to create header cells for each department in our table of names and phone numbers. In this table, the header cells in the first and fifth rows span across two columns to indicate the department for each group of names.

```
<TABLE BORDER=2 CELLPADDING=4>
<TR> <TH COLSPAN=2>Production</TH> </TR>
<TR> <TD>Raha Mutisya</TD>     <TD>1493</TD> </TR>
<TR> <TD>Shalom  Buraka</TD>    <TD>3829</TD> </TR>
<TR> <TD>Brandy Davis</TD>     <TD>0283</TD> </TR>
<TR> <TH COLSPAN=2>Sales</TH> </TR>
<TR> <TD>Claire Horne</TD>     <TD>4827</TD> </TR>
<TR> <TD>Bruce Eckel</TD>     <TD>7246</TD> </TR>
<TR> <TD>Danny Zeman</TD>     <TD>5689</TD> </TR>
</TABLE>
```

which gives us:

Production		
Raha Mutisya	1493	
Shalom Buraka	3829	
Brandy Davis	0283	
Sales		
Claire Horne	4827	
Bruce Eckel	7246	
Danny Zeman	5689	

Forms

HTML Forms are required when you want to collect some data from the site visitor. For example during user registration you would like to collect information such as name, email address, credit card, etc.

A form will take input from the site visitor and then will post it to a back-end application such as CGI, ASP Script or PHP script etc. The back-end application will perform required processing on the passed data based on defined business logic inside the application.

There are various form elements available like text fields, textarea fields, drop-down menus, radio buttons, checkboxes, etc.

HTML Form Controls

There are different types of form controls that you can use to collect data using HTML form:

Text Input Controls
Checkboxes
Controls Radio Box
Controls Select Box
Controls File Select
boxes
Hidden Controls
Clickable
Buttons
Submit and Reset Button

Example:

```
<form method="post" action="datacollection.php">
Name<input type="text" name="txtname">
<br>
Name<input type="text" name="txtname">
</form>
```

Similarly other form tags may be used . The visual example shows the FORM in the form of table so form will be create dinside the table <td> tag. It basically nests the two major tags.

Name	Value
Name	
Sex	○ Male ● Female
Eye color	green ▾
Check all that apply	☐ Over 6 feet tall ☐ Over 200 pounds
Describe your athletic ability:	
	Enter my information

Problem 1

```
<html>
<body>
<P ALIGN =RIGHT>
<RIGHT><H1>PIZZA FACTORY</H1></RIGHT>
<form method="post">
<p aling=right
<right><h1><hr>PIZZA ORDER
  FORM</hr></h1></right>
Name
<input type="text"name="name"/>
<br>
Address
<input type="text"name="address"/>
<br />
<p aling=right>
<right><h1>SIZE</h1></right>
</p>
<input type="radio" name="size" value ="small"/>small
<br />
<input type="radio" name="size" value ="medium"/>medium
<br />
<input type="radio" name="size" value ="large"/>large
<br />
```

PIZZA FACTORY

PIZZA ORDER FORM

Name
Address

SIZE

○ small
○ medium
○ large

TOPPINGS

☐ cheese
☐ olives
☐ pepperoni
☐ bacon

process order   clear

```
<p aling=right>
<right><h1>TOPPINGS</h1></right> </p>
<br />
<input type ="checkbox"name="s1" value="cheese">cheese <br />
<input type ="checkbox"name="s2" value="olives">olives <br/>
<input type ="checkbox"name="s3" value="pepperoni">pepperoni <br />
<input type ="checkbox"name="s4" value="bacon">bacon <br />
<p>
<input type="submit"name="request" value="process order"> <input type
="reset"name="clear"value="clear">
<br />
<textarea rows="5" cols="50"name=""> </textarea>
</p>
</form>
</body>
</html>
```

Problem 2


```
<html>
<body>
<form...>
first name:
<input type="text" name ="first_name" />
<br>
e.mail
<input type = "text" name ="e.mail" />
<p>select choose the one thing you love best of my pages</p>
<br>
<input type ="radio" name ="choose the one thing you love best of my pages"

value ="that gorgeous picture of you and your dogs"/> that gorgeous picture

of you and your dog
<br>
<input type ="radio" name ="choose the one thing you love best of my pages"
```

value ="the inspiring recap about youe childhood" />the unspiring recap

about your childhood

<input type ="radio" name ="choose the one thing you love best of my pages"

value ="the detailed list of your hobbies"/>the detailed list of your hobbies

<p> Check all that apply:</p>
<input type ="checkbox" name = "s1" value ="i really like your web site"/>
i really like your web site

<input type ="checkbox" name = "s2" value ="one of the best site i've seen"/>
one of the best site i've seen
<input type ="checkbox" name = "s3" value ="i have no taste so your site

didn't do much for me"/>i have no taste so your site didn't do much for me

<input type ="submit" name =" submit" value ="submit"/>
</form>
</body>
</html>
Problem 3

```
<html>
<head>
<title>first page</title> </head>
<body>
<table border=all> <tr>
<td rowspan=3>A<br>C<br>G</td> <td colspan=3>B</td>
</tr>
<tr>
<td>D</td>
<td>E</td>
<td rowspan=2>F</td> </tr>
<tr>
<td colspan=2>H</td> </td>
</table>
</form>
</body>
</html>
```

eXentensible Markup Language:-

Brief Summary of the Chapter:

It is a markup language. Markup language is a set of rules that defines the structure and format of text while presenting text. XML stands for e**X**tensible **M**arkup **L**anguage. XML is designed to transport, store and describe data. Whereas HTML was designed to display data. XML tags are not predefined.

We must define your own tags in XML. An XML document that follows all grammar rules is well formed document.

KEY POINTS OF THE CHAPTER

A markup language is a set of rules that defines the structure and format of text while presenting text.

XML is a markup language.

A meta-language is a language that is used to define other languages. XML is based on SGML.SGML was the first markup language.

XML is different from HTML as it does not display the data but describes and carries it. XML is free and extensible.

XML is platform independent.

The XML document that obeys XML grammar rule is called well-formed document.

DTD (Document definition type) is a set of rules that defines what tags appear in an XML document.

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

Important full forms:

(i) XML-extensible Markup Language

(ii) EDI-Electronic Data Interchange

(iii) CSS- Cascading Style Sheet

(iv) DTD- Document Type Definition

HTML versus XML

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

UNIT – 3
Relational Database Management System
MYSQL REVISION TOUR

A database system is basically a computer based record keeping system. There are different data models are available. The most popular data model is Relational Data Model (RDBMS). In RDBMS data is arranged in the form of table. MYSQL is software to manipulate database. It is free, open- source RDBMS.

In order to access data within MYSQL database, all programs and users must use, Structured Query Language (SQL).SQL is the set of commands that is recognized by nearly all RDBMs. SQL commands can be classified into three categories. These are:

DDL (Data Definition Language)

DML (Data Manipulations Language) and TCL (Transmission Control Language).

Apart from MYSQL is commands, it has various functions that performs some operation and returns a single value.

KEY POINTS OF THE CHAPTER

Database Management System(DBMS) It is a computer based record keeping system that stores the data centrally and manages data efficiently.

Relational Data Model In this model the data is organized into tables called relations .The relationship is established between 2 tables on the basis of common column. **Network Data Model** In this model the data is represented by collections of records and relationships among data are represented by links .

Hierarchical Data Model In this model records are organized in the form of parent-child trees.

Object Oriented Data Model in this model objects represent the data and associated operations where an object is identifiable entity with some characteristics and behavior.

Normalization Is a process of attaining good database design by removing/reducing data anomalies.

DDL: Data Definition Language

o Part of the SQL that facilitates defining creation/modification etc. of database object such as tables, indexes, sequences etc.

DML: Data Manipulation Language**.**

o Part of the SQL that facilitates manipulation (additions/deletions/modification) of data which residing in the database

tables.

Meta Data
- o Facts/data about the data stored in table.

Data Dictionary
- o A file containing facts/data about the data stored in table

Relational Data Model
- o In this model data is organized into tables i.e. rows and columns. These tables are called relations.

The Network Data Model
- o In this model data are represented by collection of records & relationships among data. The collections of records are connected to one another by means of links.

The Hierarchical Data Model
- o In this model records are organized as trees rather than arbitrary graphs.

Object Oriented Data Model
- o Data and associated operations are represented by objects. An object is an identifiable entity with some characteristics and behavior.

Relation:
- o Table in Database

Domain:
- o Pool of values from which the actual values appearing

Tuple:
- o Any single row of a relation

Attribute:
- o Any column of relation

Degree:
- o Number of attributes(fields) in a relation

Cardinality:
- o Number of tuples(rows) in a relation

View:
- o Virtual table that does not really exist in its own right but can be used to vies

Primary Key:
- o Set of one or more attributes that can uniquely identify tuples with in the relation.

Candidate Key:
- o A Candidate Key is the one that is capable of becoming Primary key i.e., a field or attribute that has unique value for each row in the relation.

Alternate Key:
- o A candidate key that is not primary key is called alternate key.

Foreign Key:
- o A non-key attribute, whose values are derived from the primary key of some other table.

Integrity Constraints
- o Integrity Constraints are the rules that a database must comply all the times. It determines what all changes are permissible to a database.

DATA TYPES IN MySQL :

Text
a) CHAR(size)
b) VARCHAR(size)

NUMERIC
a) DECIMAL(p,s)
b) INT

Date
a) DATE

Difference between CHAR and VARCHAR

The CHAR data-type stores fixed length strings such that strings having length smaller than the field size are padded on the right with spaces before being stored. The VARCHAR on the other hand supports variable length strings and therefore stores strings smaller than the field size without modification.

SQL Constraints/ Integrity Constraints

1-SQL Constraint is a condition or check applicable on a field or set of fields. 2- They can also be defined or modified after creating the tables.

3- When constraints are defined any data entering in the table is first checked to satisfy the condition specified in particular constraint if it is, only then table data set can be updated. If data updation/ insertion is violating the defined constraints, database rejects the data (entire record is rejected).

4- When a constraint is applied to a single column, it is called a column level constraint but if a constraint is applied on a combination of columns it is called a table constraint. Following constraints can be defined on a table in SQL:

Constraints name	Description
PRIMARY KEY	Used to create a primary key
UNIQUE	to create a unique key
NOT NULL	to define that column will not accept null values.
FOREIGN KEY/ REFERENCES	to define referential integrity with another table.
DEFAULT	to define the columns default value.
CHECK	to define the custom rule.

Not Null and Default constraints can be applied only at column level rest all constraints can be applied on both column level and table levels.

- **Accessing Database in MySql :**
  Through USE keyword we can start any database
  Syntax: USE <database Name>;
  Example: USE ADDRESS;

- **CREATING TABLE IN MYSQL**
  Through Create table command we can define any
  table. CREATE TABLE <tablename>
  (<columnname><datatype>[(<Size>)],..........);
  CREATE TABLE ADDRESS(SNo integer, City char(25));

- **INSERTING DATA INTO TABLE**
  The rows are added to relations using INSERT
  command.   INSERT   INTO
  <tablename>[<columnname>]
  VALUES (<value>, <value>...);
  INSERT INTO ADDRESS (SNo,
  City) VALUES (100,'JAIPUR');

- **SELECT COMMAND:**
  The SELECT command is used to make queries on the database. A query is a command that is
  given to produce certain specified information from the database table(s). The SELECT
  command can be used to retrieve a subset of rows or columns from one or more tables. The
  syntax of Select Command is:
  SELECT <Column-list>
  FROM <table_name>
  [Where <condition>]
  [GROUP BY
  <column_list>] [Having
  <condition>]
  [ORDER BY <column_list [ASC|DESC]>]
  Example:
  SELECT * FROM ADDRESS WHERE SNo=100;

- **Eliminating Redundant Data**
- DISTINCT keyword eliminates redundant
  data SELECT DISTINCT City FROM
  ADDRESS;

- **Selecting from all the rows**
  SELECT * FROM ADDRESS;

- **Viewing structure of table:**
  DESCRIBE/DESC
  <tablename>;   DESCRIBE
  ADDRESS;

Using column aliases:
  SELECT   <column   name>   AS
  [columnalias][,...] FROM <tablename>;
  SELECT   SNo,   City   AS
  "STUDENTCITY" FROM ADDRESS;

- **Condition based on a range:**
  Keyword BETWEEN used for making range checks in queries.
  SELECT SNo, CITY FROM ADDRESS WHERE SNo BETWEEN 10 AND 20;

- **Condition based on a list:**
  Keyword IN used for selecting values from a list of values.
  SELECT rno, sname FROM student WHERE rno IN (10, 20,
  60);

- **Condition based on a pattern matches:**
  Keyword LIKE used for making character comparison using strings
  percent(%) matches any substring underscore(_) matches any character
  SELECT SNo, City FROM ADDRESS WHERE City LIKE '%ri' ;

- **Searching for NULL**

    The NULL value in a column is searched for in a table using IS NULL in the WHERE clause (Relational Operators like =,<> etc cannot be used with NULL).

For example, to list details of all employees whose departments contain NULL (i.e., no value), you use the command:

        SELECT empno,
        ename FROM emp
        Where Deptno IS NULL;

- **ORDER BY clause:**

    It is used to sort the results of a query.
    SELECT <column name> [, <column name>,
    .] FROM <table name>
    [WHERE <condition>] [ORDER BY <column name>];
    SELECT * FROM ADDRESS WHERE SNo>50 ORDER BY City;

- **Creating tables with SQL Constraint :**

    CREATE TABLE command is used to CREATE tables , the syntax is:
    CREATE TABLE <Table_name>
      (column_name 1 data_type1 [(size) column_constraints],
       column_name 1 data_type1 [(size) column_constraints],
       :
       :
      [<table_constraint> (column_names)]);

- **SQL Constraint:**

    A Constraint is a condition or check applicable on a field or set of fields.
    - NOT NULL/UNIQUE/DEFAULT/CHECK/PRIMARY KEY/FOREIGN KEY Constraint:
    CREATE TABLE student (rollno integer NOT NULL);

    CREATE TABLE student (rollno integer UNIQUE);

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

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

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

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

- **Modifying data in tables:**

    Existing data in tables can be changed with UPDATE command.
    The Update command is use to change the value in a table. The syntax of this command is:
        UPDATE <table_name>
        SET   column_name1=new_value1
        [,column_name2=new_value2,……] WHERE <condition>;

    UPDATE student SET Sclass=12 WHERE Sname='Rohan';

- **Deleting data from tables:**

The DELETE command removes rows from a table. This removes the entire rows, not individual field values. The syntax of this command is

DELETE FROM <table_name>
[WHERE <condition>];

e.g., to delete the tuples from EMP that have salary less than 2000, the following command is used:

DELETE FROM emp WHERE sal<2000;

To delete all tuples from emp table:

DELETE FROM emp;

MySQL functions:

A function is a special type of predefined command set that performs some operation and returns a single value.

Single-row functions return a single result row for every row of a queried table. They are categorized into: Numeric functions, String functions, and Date and Time functions.

1) Numeric Functions

- **POWER( )** : Returns the argument raised to the specified power. POW ( ) works the same way.

Example: (i) POW(2,4); Result:16 (ii) POW(2,-2); Result:0.25 (iii) POW(-2,3) Result: -8

- **ROUND( )** : ROUND(X) Rounds the argument to the zero decimal place, Where as ROUND(X,d) Rounds the argument to d decimal places.

Example :(i) ROUND(-1.23); Result: -1   (ii) ROUND(-1.58); Result: -2

(iii) ROUND(1.58); Result: 2   (iv)ROUND(3.798, 1);Result: 3.8

(v) ROUND(1.298, 0); Result: 1   (vi) ROUND(23.298, -1); Result: 20

- **TRUNCATE( )** : Truncates the argument to specified number of decimal places.

Example: (i) TRUNCATE(7.29,1)Result: 7.2   (ii) TRUNCATE(27.29,-1) Result: 20

2) Character/String Functions

- **LENGTH( )** : Returns the length of a string in bytes/no.of characters in string.

Example: LENGTH('INFORMATICS'); Result:11

- **CHAR( )** : Returns the corresponding ASCII character for each integer passed.

Example   :   CHAR(65) ;   Result :   A

- **CONCAT( ):** Returns concatenated string i.e. it adds strings.

Example : CONCAT('Informatics',' ','Practices');   Result : Informatics Practices

- **INSTR( ):** Returns the index of the first occurrence of substring.

Example : INSTR('Informatics',' mat');

Result : 6(since *'m'* of *'mat'* is at 6th place)

- **LOWER( )/ LCASE( ):** Returns the argument after converting it in lowercase.

Example: LOWER('INFORMATICS');   Result : informati cs

- **UPPER( )/ UCASE( ):** Returns the argument after converting it in uppercase.

Example: UCASE('informatics');   Result :INFORMATICS

- **LEFT( )** : Returns the given number of characters by extracting them from the left side of the given string.

Example : LEFT('INFORMATICS PRACTICES', 3);   Resul t : INF

- **MID( )/SUBSTR( )** : Returns a substring starting from the specified position in a given string.
Example: MID('INFORMATICS PRACTICES',3,4);   Result : FORM

- **LTRIM( ) :** Removes leading spaces.
Example :   LTRIM('   INFORMATICS');   Result: 'INFORMATICS'

- **RTRIM( ):** Removes trailing spaces.
Example :   RTRIM('INFORMATICS   ');   Result:'INFORMATICS'

- **TRIM( )** : Removes leading and trailing spaces.
Example: TRIM(' INFORMATICS   ');   Result: 'INFORMATICS'

3)   **Date/Time Functions**
- **CURDATE( )** : Returns the current date
        Example: CURDATE( );   Result:'2014-07-21'

- **NOW( ):**   Returns the current date and time
        Example: NOW( );   Result: '2014-07-21 13:58:11'

- **SYSDATE( )** : Return the time at which the function executes
    Example: SYSDATE( );   Result:'2014-07-21 13:59:23'

- **DATE( ):**   Extracts the date part of a date or date time expression
        Example: DATE('2003-12-31 01:02:03');   Result::'2003-12-31'

- **MONTH( )** :Returns the month from the date passed
    Example: MONTH('2010-07-21');   Result: 7

- **YEAR( ):**   Returns the year
    Example: YEAR('2010-07-21');   Result: 2010

- **DAYNAME( ):**   Returns   the name of the weekday
    Example: DAYNAME('2010-07-21');   Result: WEDNESDAY

- **DAYOFMONTH( )**: Returns the day of the month (0-31)
    Example: DAYOFMONTH('2010-07-21');   Result: 21

- **DAYOFWEEK( ):** Returns the weekday index of the argument
    Example: DAYOFWEEK('2010-07-21');   Result: 4 (Sunday is counted as 1)

- **DAYOFYEAR(   ):**   Return the day of the year(1 -366) Example:
    DAYOFYEAR('2010-07-21');   Result: 202

- **Aggregate or Group functions:** MySQL provides Aggregate or Group functions which work on a number of values of a column/expression and return a single value as the result.

Some of the most frequently used Aggregate functions in MySQL are:

S.No	Name of the Function	Purpose
1	MAX()	Returns the MAXIMUM of the values under the specified column/expression.
2	MIN()	Returns the MINIMUM of the values under the specified column/expression.
3	AVG()	Returns the AVERAGE of the values under the specified column/expression.
4	SUM()	Returns the SUM of the values under the specified column/expression.
5	COUNT()	Returns the COUNT of the number of values under the specified column/expression.

- The **GROUP BY** clause groups the rows in the result by columns that have the same values. Grouping can be done by column name, or with aggregate functions in which case the aggregate produces a value for each group.

- The HAVING clause place conditions on groups in contrast to WHERE clause that place conditions on individual rows. While WHERE condition cannot include aggregate functions, HAVING conditions can do so.

- **ALTER TABLE COMMAND**:-

The ALTER Table command is used to change the definition (structure) of existing table.

Usually , it can:

(i) Add columns to a table

(ii) Delete columns

(iii) Modify

a column The

syntax of this

command is: For

Add or modify

column:

ALTER TABLE <Table_name> ADD/MODIFY <Column_defnition>; For Delete column

ALTER TABLE <Table_name> DROP COLUMN <Column_name>;

Example :

To add a new column address in EMP table command will be : ALTER TABLE EMP ADD (address char (30));

To modify the size of sal column in EMP table, command will be: ALTER TABLE EMP MODIFY (sal number(9,2)); To delete column Address from

Table EMP the command will be: ALTER TABLE
EMP DROP COLUMN address;

• **Cartesian Product (or Cross Join):** Cartesian product of two tables is a table obtained by pairing each row of one table with each row of the other. A Cartesian product of two tables contains all the columns of both the tables.

• **Equi-Join**: An equi join of two tables is obtained by putting an equality condition on the Cartesian product of two tables. This equality condition is put on the common column of the tables. This common column is, generally, primary key of one table and foreign key of the other.

• **Foreign Key:** It is a column of a table which is the primary key of another table in the same database. It is used to enforce referential integrity of the data.

• **Referential Integrity:** The property of a relational database which ensures that no entry in a foreign key column of a table can be made unless it matches a primary key value in the
corresponding column of the related table.

• **Union:** Union is an operation of combining the output of two SELECT statements.

Display data from multiple Tables :-
It does no good to put records in a database unless you retrieve them eventually and do something with them.

Creating Joins on tables :-
If a SELECT statement names multiple tables in the FROM clause with the names separated by commas, MySQL performs a full join. For example, if you join t1 and t2 as follows, each row in t1 is combined with each row in t2:

mysql> **SELECT t1.*, t2.* FROM t1, t2;**

```
+---- +  ----+----+---- +
| i1 | c1 | i2 | c2 |
+---- +----+----+----+
| 1  | a     | c  |
| 2  | b     | c  |
| 3  | c     | c  |
| 1  | a     | b  |
| 2  | b     | b  |
| 3  | c     | b  |
| 1  | a     | a  |
| 2  | b     | a  |
| 3  | c     | a  |
+---- +----+----+----+
```

A full join is also called a *cross join* because each row of each table is crossed with each row in every other table to produce all possible combinations. This is also known as the *cartesian product*. Joining tables this way has the potential to produce a very large number of rows.

If you add a WHERE clause causing tables to be matched on the values of certain columns, the join becomes what is known as an ***equi-join*** because you're selecting only rows with equal values in the specified columns:

mysql> **SELECT t1.*, t2.* FROM t1, t2 WHERE t1.i1 = t2.i2;**

```
+---- +  ----+----+
| i1 | c1 | i2 | c2 |
+---- +----+ ----+---- +
| 2 | b   | c |
| 3 | c   | b |
+---- +----+ ----+---- +
```
The JOIN and CROSS JOIN join types are equivalent to the ',' (comma) join operator.

Solved Questions :-

Q1. Consider the following tables ACTIVITY and COACH. Write SQL commands for the statements (i) to (iv) and give outputs for SQL queries (v) to (viii).

Table: ACTIVITY

ACode	ActivityName	ParticipantsNum	PrizeMoney	ScheduleDate
1001	Relay 100x4	16	10000	23-Jan-2004
1002	High jump	10	12000	12-Dec-2003
1003	Shot Put	12	8000	14-Feb-2004
1005	Long Jump	12	9000	01-Jan-2004
1008	Discuss Throw	10	15000	19-Mar-2004

Table: COACH

PCode	Name	ACode
1	Ahmad Hussain	1001
2	Ravinder	1008
3	Janila	1001
4	Naaz	1003

(i) To display the name of all activities with their Acodes in descending order.

(ii) To display sum of PrizeMoney for each of the Number of participants groupings (as shown in column ParticipantsNum 10,12,16).

(iii)To display the coach's name and ACodes in ascending order of ACode from the table COACH.

(iv) To display the content of the GAMES table whose ScheduleDate earlier than 01/01/2004 in ascending order of ParticipantNum.

(v) SELECT COUNT(DISTINCT ParticipantsNum) FROM ACTIVITY;

(vi)SELECT MAX(ScheduleDate),MIN(ScheduleDate) FROM ACTIVITY;

(vii) SELECT SUM(PrizeMoney) FROM ACTIVITY;

(viii) SELECT DISTINCT ParticipantNum FROM COACH;

Ans :

(i) SELECT ActivityName, ACode FROM ACTIVITY ORDER BY Acode DESC;

(ii) SELECT SUM(PrizeMoney),ParticipantsNum FROM ACTIVITY GROUP BY ParticipantsNum;(iii)SELECT Name, ACode FROM COACH ORDER BY ACode;

(iii) SELECT * FROM ACTIVITY WHERE ScheduleDate<'01-Jan-2004' ORDER BY ParticipantsNum;

(v) 3

(vi) 19-Mar-2004   12-Dec-2003

(vii) 54000

(viii) 16
        10
        12

Q2. Consider the following tables GAMES and PLAYER. Write SQL commands for the statements (i) to (iv) and give outputs for SQL queries (v) to (viii).

Table: GAMES

GCode	GameName	Number	PrizeMoney	ScheduleDate
101	Carom Board	2	5000	23-Jan-2004
102	Badminton	2	12000	12-Dec-2003
103	Table Tennis	4	8000	14-Feb-2004
105	Chess	2	9000	01-Jan-2004
108	Lawn Tennis	4	25000	19-Mar-2004

Table: PLAYER

PCode	Name	Gcode
1	Nabi Ahmad	101
2	Ravi Sahai	108
3	Jatin	101
4	Nazneen	103

 (i) To display the name of all Games with their Gcodes.
(ii) To display details of those games which are having PrizeMoney more than 7000. (iii)To display the content of the GAMES table in ascending order of ScheduleDate.
(iv) To display sum of PrizeMoney for each of the Number of participation groupings
 (as shown in column Number 2 or 4).
(v) SELECT COUNT(DISTINCT Number) FROM GAMES;
 (vi)SELECT MAX(ScheduleDate),MIN(ScheduleDate) FROM
 GAMES;
 (vii) SELECT SUM(PrizeMoney) FROM GAMES;
 (viii) SELECT DISTINCT Gcode FROM PLAYER;

Ans : (i) SELECT GameName,Gcode FROM GAMES;
(ii) SELECT * FROM GAMES WHERE PrizeMoney>7000;
(iii) SELECT * FROM GAMES ORDER BY ScheduleDate;
(iv) SELECT SUM(PrizeMoney),Number FROM GAMES GROUP BY Number;
(v) 2
(vi) 19-Mar-2004 12-Dec-2003
(vii) 59000
(viii)101
         103
         108

Q3. Consider the following tables HOSPITAL. Give outputs for SQL queries (i) to (iv) and write SQL commands for the statements (v) to (viii).

No	Name	Age	Department	Dateofadmin	Charge	Sex
1	Arpit	62	Surgery	21/01/06	300	M
2	Zayana	18	ENT	12/12/05	250	F
3	Kareem	68	Orthopedic	19/02/06	450	M
4	Abhilash	26	Surgery	24/11/06	300	M
5	Dhanya	24	ENT	20/10/06	350	F
6	Siju	23	Cardiology	10/10/06	800	M
7	Ankita	16	ENT	13/04/06	100	F
8	Divya	20	Cardiology	10/11/06	500	F
9	Nidhin	25	Orthopedic	12/05/06	700	M
10	Hari	28	Surgery	19/03/06	450	M

(i) Select SUM(Charge) from HOSPITAL where Sex='F';
(ii)   Select COUNT(DISTINCT Department) from HOSPITAL;
(iii)   Select SUM(Charge) from HOSPITAL group by Department;
(iv)   Select Name from HOSPITAL where Sex='F' AND Age > 20;
(v) To show all information about the patients whose names are having four characters only.
(vi) To reduce Rs 200 from the charge of female patients who are in Cardiology department.
(vii) To insert a new row in the above table with the following data :
11, 'Rakesh', 45, 'ENT', {08/08/08}, 1200, 'M'
(viii) To remove the rows from the above table where age of the patient > 60.

Ans : (i)   1200
(ii)   4
(iii)   1050
       700
     1150
     1300
(iv)   Dhanya
(v) SELECT * FROM HOSPITAL WHERE NAME LIKE "_ _ _ _";
(vi) UPDATEHOSPITAL   SET   CHARGE   =   CHARGE   –   200   WHERE
 (DEPARTMENT = 'CARDIOLOGY' AND SEX = 'F');
(vii) INSERT INTO HOSPITAL VALUES(11,'Rakesh',45,'E NT',{08/08/08}, 1200,
     'M');
(viii) DELETE FROM HOSPITAL WHERE AGE > 60;
Q4. Consider the following tables BOOKS. Write SQL commands for the statements (i)
 to (iv) and give outputs for SQL queries (v) to (viii).

Table : BOOKS

B_Id	Book_Name	Author_Name	Publisher	Price	Type	Quantity
C01	Fast Cook	Lata Kapoor	EPB	355	Cookery	5
F01	The Tears	William Hopkins	First	650	Fiction	20
T01	My C++	Brain & Brooke	FPB	350	Text	10
T02	C++ Brain	A.W.Rossaine	TDH	350	Text	15
F02	Thuderbolts	Anna Roberts	First	750	Fiction	50

i). To list the names from books of Text type.
ii). To display the names and price from books in ascending order of
their price. iii). To increase the price of all books of EPB publishers by
50.
iv). To display the Book_Name, Quantity and Price for all
C++ books. v). Select max(price) from books;
vi). Select count(DISTINCT Publishers) from books where Price
>=400; vii).Select Book_Name, Author_Name from books where
Publishers = 'First'; viii).Select min(Price) from books where type =
'Text';

Ans   :   (i) SELECT Book_Name FROM BOOKS WHERE Type = 'Text';
 (ii) SELECT Book_Name, Price FROM BOOKS ORDER BY Price;
(iii) UPDATE BOOKS SET Price = Price + 50 WHERE Publisher = 'EPB';
  (iv) SELECT Book_Name, Quantity, Price FROM BOOKS WHERE Book_Name
 LIKE '%C++%';
(v) 750
 (vi) 2

(vii)	The Tears	William Hopkins
	Thuderbolts	Anna Roberts

(viii) 350

Q5. Consider the tables ITEMS & COMPANY. Write SQL commands for the statements (i) to (iv) and give the outputs for SQL queries (v) to (viii).

Table : ITEMS

ID	PNAME	PRICE	MDATE	QTY
T001	Soap	12.00	11/03/2007	200
T002	Paste	39.50	23/12/2006	55
T003	Deodorant	125.00	12/06/2007	46
T004	Hair Oil	28.75	25/09/2007	325
T005	Cold Cream	66.00	09/10/2007	144
T006	Tooth Brush	25.00	17/02/2006	455

Table : COMPANY

ID	COMP	City
T001	HLL	Mumbai
T008	Colgate	Delhi
T003	HLL	Mumbai
T004	Paras	Haryana
T009	Ponds	Noida
T006	Wipro	Ahmedabad

i). To display PNAME, PRICE * QTY only for the city Mumbai.
ii). To display product name, company name & price for those items which IDs are equal to the IDs of company.
iii). To delete the items produced before 2007.
iv). To increase the quantity by 20 for soap and paste.
v). SELECT COUNT(*) FROM ITEMS WHERE ITEMS.ID=COMPANY.ID;
vi). SELECT PNAME FROM ITEMS WHERE PRICE=SELECT MIN(PRICE) FROM ITEMS;

vii). SELECT COUNT(*) FROM COMPANY WHERE COMP LIKE "P_ _
_ _"; **viii).** SELECT PNAME FROM ITEMS WHERE QTY<100;
Ans :
(i) SELECT PNAME, QTY*PRICE FROM ITEMS
WHERE ITEMS.ID = COMPANY.ID AND COMPANY.City='Mumbai';
(ii) SELECT PNAME, COMP, PRICE FROM ITEMS,
COMPANY WHERE ITEMS.ID = COMPANY.ID;
(iii) DELETE FROM ITEMS WHERE MDATE < {01/01/2007};
(iv) UPDATE ITEMS SET QTY = QTY + 20
WHERE PNAME = 'Soap' OR PNAME = 'Paste';
(v)   4
(vi)   Soap
(vii)2
(viii)   Paste
         Deod
         orant

DATABASE TRANSACTIONS

Brief Summary of the Chapter:

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

KEY POINTS OF THE CHAPTER

1 **TRANSCATION:** A transaction is a logical unit of work (LUW) that must succeed or fail in its entirety.

2 **COMMIT** committing a transaction means all the steps of a transaction are carried out successfully and all the data changes are made permanent in the database .

3 **ROLLBACK** Transaction roll back means that the transaction has not been finished completely and hence all data changes made by the transaction in the data base , if any , are undone and the data base returns to the same state as it was before this transaction execution started .

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

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

6 **PROTOCOL** A **Protocol** means the rules that are applicable for a network. Protocol defines standardized formats for data packets, techniques for detecting and correcting errors and so on.

7 **DISTRIBUTED DATABASE** The **distributed database** may be defined as a database stored and running on a collection of machines that do not have shared memory, yet looks to its users like a single database on single computer.

8 **DATA FRAGMENTATION** A distributed database is broken into logical units called fragments and this is known as data fragmentation.

For example , transaction preparing result –card ma y involved
following steps :
Open Marks file ,
Result file Read
Marks
Calculate
Percentage
Calculate
Grade Write
in Result file
Print Report
card Close
both files
The above transaction will successfully terminate (COMMIT) if all of its steps are executed successfully, otherwise all of its steps would not be processed at all .That means , even if

some of it steps get executed and then if an error occurs then all the executed steps would be undone(ROLLBACK)

SOLVED QUESTIONS

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

   Ans. - Multiple transactions can be executed in one of the following two ways:

   (i) Serially (ii) Concurrently

2. **What is a savepoint**?

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

3. **What to you understand by a database transaction?**

   Ans. - A database transaction is a logical unit of work that must succeed or fail in its entirely.

4. **Why do understand by transaction COMMIT and ROLLBACK?**

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

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

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

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

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

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

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

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

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

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

   Ans. -SQL supports following TCL commands

   BEGIN |START TRANSACTION-Marks the beginning of a transaction

   COMMIT-Ends the current transaction by saving database changes and starts a new transaction.

   ROLLBACK-Ends the current transaction by discarding changes and starts a new transaction.

   SAVEPOINT-Defines breakpoints for the transactions to allow partial rollbacks. **SET AUTOCOMMIT**-Enables or disable the default autocommit mode.

8. **Which two statements complete a transaction?**
    a. DELETE employees;
    b. DESCRIBE employees;
    c. ROLLBACK TO SAVEPOINT C;
    d. GRANT SELECT ON employees TO SCOTT;
    e. ALTER   TABLE
       employees   MODIFY
       COLUMN sal;
    f. Select MAX(sal)
       FROM employees
       WHERE department_id=20;

    Ans. - C, E

UNIT-4
IT- Applications

Brief Summary

Three major groups of IT applications covered in this chapter are: e-Governance,e-Business, and e-Learning.

       e-Governance involves applications which are used by government agencies/ organizations to provide better governance.

       e-Business applications use technology to effectively access and deliver business related services and perform various kinds of business transactions.

       e-Learning applications use technology to effectively deliver and monitor learning and teaching processes. They help the trainer to organize and manage his/her lesson plans, present them to students/learners, evaluate and take the feedback to enhance & fine-tune this process in future.

       An IT application has two major parts: Front-end (The user interface) and back-end(The database).

       The front-end of an IT application is usually a group of one or more forms through which the user enters the input values and is shown the corresponding output.

       The back-end of an IT application is the database in which all the data is stored. This database resides in the server. All the data which is requested by the front-end is supplied by back-end. A good back-end ensures sustainability, efficiency and easy modification of the application.

Use of ICT has its social and economic impacts.

People change their way of conducting the transactions and thus save their time, money, and energy. Economy is impacted as ICT leads to fast completion of data transfer and data processing jobs. ICT also brings transparency in the administration.

ICT stands for Information and Communication Technology. Like everything else that is used by common man, ICT (Information and Communication Technology) also has impacted the society. ICT has impacted the society in a much wider way than any other technology. Most of these impacts are positive, though there are some negative impacts also.

Social and Economic benefits of ICT:

•   Social networking sites help people remain in touch with their nears and dears even when they are staying on opposite sides of the globe.

•   Social networking sites help like-minded people come together and work for some cause.

•   e-Governance sites help people save their productive time by performing various government related jobs like getting some forms, depositing bills online.

• ICT helps economy grow at a faster rate as it provides transparency in the processes and helps the government to keep check on defaulters.

• Due to e-Banking and use of plastic money more money is put in circulation leading to faster growth of GDP.

• *e-Learning* sites make quality study material available even to the students staying at remote places.

e-Business- To reach the customers and business associates in an effective and fast manner business houses (now a days many small shops like snacks corners and paan shops also) provide their services on the net.

These ICT enabled counters are used to get orders and feedbacks from the customers and also for inter-business transactions. This helps the businesses to widen their customer base.

1. Amazon.com (e-Business site of Amazon.com) - Amazon is the world's largest
online store. Through this URL Amazon does its online business

2. flipkart.com – Very popular online shopping stor e offering a range of products at very reasonable prices.

e-Learning : e-Learning has multiple goals. It is much more than having a net connection and/or CDs through which people learn. E-Learning is about giving freedom to people to learn whatever they want to learn and whenever they want to learn. This is irrespective of (except in exceptional cases) age, caste, gender, economical background, or qualification of the learner. The only requirement is the will to learn. E-learning is available on almost all the topics imaginable.

1. www.khanacedemy.com (e-Learning site) - You will access free tutorials in all web development technologies and almost on any topic of learning from a vast variety of subjects. Matter is available in interactive video formats.

2. www.cbsecsnip.in - It is an educational site where subject content and solved papers are present along with sample projects , from which students can benefit.

3. www.kvselearning.in- This portal provides interactive modules for students to learn various topics on informatics practices using interactive video lessons.

CLOUD COMPUTING(Future trends)

This means that cloud computing is a type of Internet-based computing, and it consists of every situation where the use of IT resources by an entity, including a person or an organization.

Properties of cloud computing are :

Access to the resources is:

      Controlled by the entity, and restricted by them to their

      authorized users. Delivered via the Internet to all of these users.

   The resources are:

      Hosted by a service provider on behalf of the

      entity. Dedicated to their exclusive use.

   Data processed by the resources is:

   Private to the entity and its associates.

   Entered or collected by them, or automatically produced for them

Question- (Short Answers):-

Q. Write Short Notes on : e-Governance, e-Business, e-Learning.

Answer : **e-Governance** involves applications which are used by government agencies/organizations to provide better governance.

e-Business applications use technology to effectively access and deliver business related services and perform various kinds of business transactions.

e-Learning applications use technology to effectively deliver and monitor learning and teaching processes. They help the trainer to organize and manage his/her lesson plans, present them to students/learners, evaluate and take the feedback to enhance & fine-tune this process in future.

Q. What are Front-end (The user interface) and back-end (The database) ?
Answer : An IT application has two major parts: Front-end (The user interface) and backend (The database) .The front-end of an IT application is usually a group of one or more forms through which the user enters the input values and is shown the corresponding output. A good front-end ensures the acceptance of the application in the first go. The back-end of an IT application is the database in which all the data is stored. This database resides in the server.
All the data which is requested by the front-end is supplied by back-end. A good
back-end ensures sustainability, efficiency and easy modification of the application.

Q. What are the terms involved in Development of an IT application ?
Development of an IT application involves creation of front-end, back-end, and connecting these two. It also involves testing the application and then implementing it.

Q. What social and economic impacts are found of ICT. ?
Answer : Society is impacted as due to ICT people change their way of conducting the transactions and thus save their time, money, and energy. Economy is impacted as ICT leads to fast completion of data transfer and data processing jobs. ICT also brings transparency in the administration.

Q. What do you mean by Infomania ?
Answer : Infomania is the condition of reduced concentration caused by continually responding to electronic communications such as e-mail, SMSs, MMSs etc. ICT is making more and more people info maniac. This is making some people waste their productive time in the office, neglect their families and duties. Some people are also in a habit of frequently checking their e-mails even when they are on vacation with their families. We have to be careful in the use of ICT so that we use it constructively and not get obsessed with it and become info maniacs.

Q. What OS and fonts are used for Indic Language Support ?
Answer : Mac OS 10.5 supports Devanagari, Gujarati, Gurmukhi and Tamil. Linux based desktops support Bengali, Devnagari, Gujarati, Kannada, Malayalam, Oriya, Tamil, Telugu and Gurmukhi,

**Q. Is it a good practice to take in the inputs using Text Fields only? Justify your
    answer.**
Answer : Text Field is used to get small textual information like Name, RollNo, email address, quantity, etc. Disabled/Uneditable Text Fields are also used to display such information so it is a good practice to take in the inputs using Text Fields. But we may also use Dialog to take input.

Q. How can be established Front-End and Database Connectivity ?
Answer:-A database application consists of Front-End and Database (Back-end). These two entities cannot work in isolation. Whatever data is entered by the user has to go to the database and whatever relevant data is extracted from the database is to be shown to the user through the Front-End. Therefore, the Front-End and the Database of an IT application must be connected. This connectivity is achieved as learnt in Chapter 6 (Database Connectivity). If the application is web based then the connectivity is achieved using some scripting language (like vbScript or JavaScript).

Q. Are there Websites in Indian languages ? Write about them ?
Ans: Yes, these days multiple Government and private organizations are providing their websites in Hindi and other regional languages also. The aim is to provide their services even to the common people in remote areas. Small towns where computers and   internet

have reached, information on the net should also be available in regional languages so that people not knowing English can also have access to the information. Language should not be a hindrance but a support to learning.

Understanding the importance of regional languages, many websites have also provided translation services so that the same page can be viewed in any language of user's choice.

Q. What do mean by Front-End Interface ?

Front-end and back-end are terms used to characterize program interfaces and services relative to the initial user of these interfaces and services. (The "user" may be a human being or a program.)

A "front-end" application is one that application users interact with directly.

A "back-end" application or program serves indirectly in support of the front-end services, usually by being closer to the required resource or having the capability to communicate with the required resource. The back-end application may interact directly with the front-end or, perhaps more typically, is a program called from an intermediate program that mediates front-end and back-end activities.

Q. What Components are used for creating Front-end of any software? Give details about those components.

Ans: To create a front-end various components, like those studied in Java GUI application development, are used. Some of the most commonly used components are discussed below:

Text Field: Text Field is used to get small textual information like Name, RollNo, email address, quantity, etc.

Text Area: Text Area is used to get long textual information which may span multiple lines of text. E.g. to get Address, Complaint, Suggestion etc.

Radio Button: Radio buttons are used to get an option out of several mutually exclusive (out of which only one can be selected) options. Examples of such options are Gender (Male or Female or Other), Type of Credit Card (Master or Visa or Other), Type of internet connection (DialUp or Braodband), etc.

Check Box: Check boxes are used to get one or more options out of several given options which are not mutually exclusive. Examples of such options are Hobbies (a user may have zero or more hobbies), Magazines to subscribe for (a user may subscribe to zero or more of the given magazines) etc.

List: A list is used to get one or more options out of several given options which may or may not be mutually exclusive. This may seem to be the case where Check Boxes are to be used, but the difference is in the number of options available. If the number of options is small, then Check Boxes can be used. In case of large number of options, using Check Boxes may take up a lot of space on the form and it may also be inconvenient for the user to select the desired options. In such cases Lists are preferred over checkboxes. Examples of such cases are: To select cities out of a given list of cities, to select magazines out of a given list of magazines, etc.

Combo Box: A Combo Box is used to get an option out of several given options which are mutually exclusive. This may seem to be the case where Radio Buttons are to be used, but the difference is in the number of options available. If the number of options is small, thenRadio Buttons can be used. In case of large number of options, using Radio Buttons may take up a lot of space on the form and it may also be inconvenient for the user to select the desired option. In such cases Combo Boxes are preferred over radio buttons. Examples of such cases are: To select a city out of a given list of cities, to select a train out of a given list of trains, etc.

Password Field: A Password Field is used to get some secret textual information like Password, CVV number of a credit card etc.