Short answer questions with answers(2marks)

1.Define OOP.

Object oriented programming is methodology or Para diagram to design a program using classes and objects. It simplifies the software development and maintains by providing sOme concepts.Object,Class, Inheritance, Polymorphism,Abstraction,Encapsulation

2.Who invented Java.

JAMES GOSLING

3. What is an object?

Object : An entity that has state and behavior is known as an object. For example a chair, pen, table

4.. What is a class?

Class : collection of objects is called class. It is a logical entity.

5.WHAT is a variable?

A variable is a data name that may be used to store a data value. During execution of a program the values are change is called **variable**. The variable may take different values at different times during execution.

6.What is a constant?

A constant are fixed values those are not changed during the execution of program

7.What are the Methods?

A method is a set of code which is referred to by name and can be called at any point in a program simply by utilizing to methods name.

8.what is a constructor?

Ans: It's special method is used to initialize the instance variables at the time of object creation.

9.Write about if statement.

Simple if statement:-

Syntax:-if (test _ condition)

{

  statement_ block;

}
statement _ X;

In the above simple if syntax, If the test _ condition is true.
The statement – block will be executed,otherwise the
statement will be skipped and execution will jump to
the statement _ X.

10.Define an array.

" An array is defined as a set of same data type items. They can have a common name and stoned in continues locations of the memory". The individual values of array are called as elements. Array can be any data type item.

11.what is inheritance?

Process by which one class acquires the properties (data member) and functionalities (methods) of another class is called inheritance.

12.what is overloading?

Definition:- overloading refers to the ability of use a single identifier to define multiple methods of class that differ in their input and output parameters.

13.What is a package?

A package is collection of classes grouped to gather for achieving responsibility under a common name packages are a way of grouping a variety of class together.

Syntax : package <package name >

Packages are two types.**Java API packages and Java user defined packages.**

14.what is interface?

An interface is basically a kind of class. It contains methods and variables. But the major differences is that interfaces define only abstract methods and final fields. This means that interfaces do not specify any code to implement those methods and data fields contain constants.

Syntax :-

interface interface name
{
Variable declaration; Methods declaration;
}

15.What is debugging?

the process of removing errors is called debugging.

Errors in java program: there are basically 3 types of errors in the java program.

1.Compile Errors 2.Runtime Errors .3.Logical Errors

16.Define exception?

Exceptions:-An exception is a runtime error. It means all exceptions occur only at runtime but some exceptions are detected at compile time and some at runtime.

Long answer questions with answers(6marks)
marks questions and answers?
1. Explain the features of Java
Features of java
Java programs can be easily moved from one computer system to another any where and anytime changes and upgrades in the system will not effect to change to source   code.

Simple: Java is a small and simple language many feature of c and c++ that are redundant part of java.Java uses many constructs of c and c++.

Object: Java is true object oriented language .

Robust and Security : Java is robust language

Distributed: Java is designed as distributed for creating applications on networks.

Platform independent: java source code can run on all operating systems.

Multithreading: Multithreading means handling multiple tasks simultaneously. This means that we need not wait for the application to finish on task before beginning another.

Dynamic Binding: Java is capable of dynamically linking in new class libraries, methods and objects.

Interpreted: Java byte code is translated on the fly to native machine instructions and is not stored anywhere.

Platform Independent : Java Programs can be easily moved from one computer system to another, anywhere and any time.

2.Explain the java program, structure.

Java Programming Structure :

A Java program may contain many classes of which only one class defines a main method. Classes contain data members and methods that operate on the data members of the class.

To write Java program may contain one or more sections as shown below.
Documentation Section.
Package Statement.
Import Statements.
Interface Statements.

Class definitions
Main method class.
{Main method definition
}
Documentation Section: This section contains set of
comment lines giving the name for the program, the author name,
software and hardware requirements.
Package statements : The first statement allowed in Java program is a
package statement. This statement declares a package name and informs
the compiler that the classes defined here belong to this package.
Import Statement : This is similar to the include statement in C. we can
decline number of import statements in the program.
Interface Statements : An interface is like a class but includes a group of
method declarations. This is also optional section.
Class Definition : Java program may have multiple system definitions.
Classes are the primary and essential element of a java program. These
classes are used to map the object to real world problems.
Main method class : Every java stand-alone program requires a main
method as its starting point; this class is the essential part of a java
program. The main method creates objects of various classes and
establishes communication between them. On reaching the end of main,
the program terminates and thecontrol passes back to the operating
system.
4.What are the operators in JAVA?
Operators Java
A. Java provides a rich set of operators to manipulate variables we can
devide all the java operators in to the following groups.
a.ARITHMETICAL OPERATORS.
b.RELATIONAL OPERATORS.
c. LOGICAL OPERATORS.
d. BIT WISE OPERATORS.
e. ASIGNMENT OPERATORS.
f. INCREMENT AND DECREMENT OPERATORS.
g. CONDITIONAL OPRATORS.
**A. ARITHMATICAL OPERATORS:- Arithematical operators are used in
mathematical expressions in the same way that they are used algebra. The
following table its arithematical operators .**
OPERATORS   purpose

+	Addition
_	Subtraction
/*	multiplication
\	division
%	remainder ,

Un like , c java allows the modulas to the float values

after integer division flere quotient must be integer value .

B.RELATIONAL OPERATORS:- There are six following
relational operation supported by java language.

OPERATORS	PERPOSE
=	It is equal to
!=	It is not equal to
<	It is less than
>	Greater than
>=	Greater than equal to
<=	Less than equal to

C.LOGICAL OPERATORS:- The following table lists logical operators

OPERATOR	PURPOSE
&&	AND
‖	OR
!	NOT

F. INCREMENT AND DECREMENT OPERATORS :- They are two increment and decrement operators ++ and - - . These two operators are unique in that can be written both before the operand there are applied to called prefix increment and decrement (+ + i / - - i)

G.CONDITIONAL OPERATORS :-Conditional operators is also known as that ternary operators . This operator consists of three operands and is used to evaluate Boolean expressions the goal of the operators is decide which value should be assigned is the variable.

SYNTAX:- variable x =(conditional expression) ? expression1: expression2

Conditional expression is evaluated first and if it is true expression1 is assigned to the variable x.If it is false expression2 to is assigned to the variable x.

5.EXPLAIN **Java Methods with Arguments and Return Value ?**

A Java Method can have zero or more parameters. And, they may return a value. Ex : Return Value from Method
Let's take an example of Method returning a value.

```
Class square Main {
Public static void main (String [] args)                                    (vt4:page5)
{
Int result;
Result = square ();
System.out.println("squared value of 10 is :"+ result);
}
Public static int square () {
return statement Return 10 * 10 ;
}
}
```

When you run the program, the output will be Squared value of 10 is : 100

In the above code snippet the method square () does not accept any arguments and always returns the value of 10 squared.

Notice, the return type of square()method is int meaning, the method returns an integer value.

```
Class Square main
 {
Public static void main(String [] args) { 100 result = square ();
}
Private static int square ( ) {
return statement Return 10 * 10;
}
}
```

6.Explain types of packages?

Types of packages :- Packages are two types.
1.Java API packages
2.Java user defined packages.

1.Java API packages :-
They provides a large number of classed grouped in to different packages according to functionality like long. Util , out. Applet etc. each package provides different functionality to our java program. The different packages are :

Java Long :- It includes class primitive data types, string math functions.

Java .util :- Languages, utility classes such as vector, hash tables, random numbers, date etc.

Java . Applet : - It includes classes for windows buttons list menus and abstract window tool kit.

Java. IO :- Input output support classes.

Java . net :- Net stands for network. Its mainly in client – sever programming.

Java.text :- this package is useful to format the numeric values (Date format class for dates) [number format class for values]

Java.sql:- Sql stands for structured query language. This package helps to connect to database like or Sybase, retrieve data from there and used in the java application.

User_ defined packages :-

While declaring package first declare the name of the package using the packages keyword followed by package name must be the first line in java

Syntax :- package < package name>; Example:- package student;
Using one class from other package. The following sample program will be class from other package

Example :- package x; public class y
{
public void display ()
{
System.out.println ("class y");
}
}

The above example has a package name x and containing a simple class y. this should be name y.java stored in the subsidiary "x". if we compile this java file, resultant "y" class with stored in the same sub- directory.

Short answer questions with answers(2marks)

1.What is database ?

Ans:A database can be defined as a collection of inter related relevant data stored together to serve multiple applications.

2.What is Data Processing ?

Ans: Carrying out operations on data by a computer to retrieve, transform or manipulate data is called as data processing.

3.What is a DBMS ?

ANS: Database Management System (DBMS) can be defined as a collection of programs or software packages those are used to define, manipulate, control and processing the database.

4.What are components of DBMS ?

Ans: Components of DBMS are   1.Design tools   2.Run time facilities,
,   3.DBMS engine.

5.Define Schema and Sub-Schema?

Ans:The overall design of the database is called the database 'schema'.

6. Write the commands of DDL, DML, DCL?

The DDL(DATA DEFINITION LANGUAGE) commands are 1.Create 2.Alter 3.Drop.

The DML(DATA MANIPULATION LANGUAGE) commands are

1.SELECT   2.INSERT   3.UPDATE   4. DELETE.

The DCL(DATA CONTROL LANGUAGE) commands are

1.GRANT 2. REVOKE,   3.COMMIT   4. ROLLBACK

7.What is Entity and Entity set ?

Ans: An Entity is an "object" that exists and is distinguishable from other objects.

An Entity is represented by a set of attributes.
The Entity Set is a set of entities of the same type, that share the same properties or Attributes.

8.What is Relationship and Relationship set ?

Ans: Relationship is an association among several entities.
 A Relationship set is a set of relationships of the same type.

9.What is Weak Entity and strong Entity ?

Strong Entity Set: An Entity set which is having sufficient attribute to form a primary key and does not depending on other entity set to form a primary key is called strong entity set.

<u>Weak Entity Set</u>: If existence of an entity set of depends on other entities then it is called weak entity set. A weak entity set does not have sufficient of attributes to form a primary key.

10. What is a Domain?

Ans: **Domain:** It is a set of permissible values for each attribute is known as a domain.

11. What is Degree of table ?

Ans:Degree: It is number of columns associated with a table. This property is used to describe the total number of columns a table consists.

12. What are mapping cardinalities ?

Ans: Mapping Cardinalities express the number of entities to which another entity can be associated via a relationship set.

13. What is Primary Key?

Ans: A **primary key** is a column or set of columns in a table that uniquely identifies tuples (rows) in that table.

14. What are different data types in SQL.?

Ans: Data types in SQL are 1. CHAR 2. VARCHAR 3. VARCHAR 2
- 4. NUMBER , 5. DATE, 6 LONG, 7RAW / LONG RAW.

15. What is System and sub system?

Ans:System is an orderly grouping of components linked together for Specific objectve or goal. Ex: RTC reservation system , Net banking system.

Sub System is One of the number of component parts of a system.

16. What is data dictionary?

A data dictionary is a file that contains metadata, i.e. Data about data. This file is consulted before actual data are read or modified in the database system.

Long answer questions with answers(6marks)

1..What are the advantages of DBMS?

Ans:The advantages of DBMS are:

1.Program data independence

2. Minimal data Redundancy

3.Improved data consistency

4.Improved data sharing

5.Increased productivity of application development.

6. Enforcement of standards

7.Improved data Quality

8.Improved data accessibility and responsibility.

9.Reduced program maintenance.

2.What are the responsibilities of Database Manager ?

Responsibilities of Database Manager are:

1.Interaction with File Manager : The raw data is stored on the disk using the file system which is usually provided by conventional operating system.

2.Integrity Enforcement : The data values stored in the database must satisfy certain types of consistency constraints.

3.Security Enforcement : Not every user of the database needs to have access to the entire content of the database.

4.Backup & Recovery: It is the responsibility of database manager to detect such Failures and restore the database .

5.Concurrency Control : It is necessary for the system to control the interaction among the concurrent users

6.Authorization Control : This module checks that the user has necessary authorization to carry out the required function.

Qno:3...What are the functions of DBA ?

Database Administrator is a person who has central control over the system is called data base administrator. The functions or responsibilities of DBA are
1.Schema Definition.
2.Storage Structure and access method definition.
3.Schema physical Organization and Modification.
4. Granting of authorization for data access .
5.Routine maintenance.

1.Schema Definition: The DBA creates the original database schema by executing a set of definition statements in the DDL.

2.Storage structure and access Method Definition: DBA will decide the actual storage structure and different access methodologies for the database.

3.Schema Physical Organization and Modification: The DBA carries out changes to the schema and physical organization to reflect the changing needs of the organization, are to alter the physical organization to improve performance.

4.Granting of Authorization for data access: By granting different types of authorization, the database administrator can regulate which of the database various users can access.

5.Routine Maintenance: DBA is the final authority to regulate the daily activities.

Qno:4.Explain the mapping constraints ?

For a binary relationship set R between entity sets A and B, the mapping cardinality must be one of the following four types of mapping cardinalities.
1.ONE –to–ONE relationship
2. MANY –to–MANY relationship
3. ONE– to - MANY relationship
4.MANY – to -MANY relationship

1.ONE – to – ONE relationship: An entity in A is associated with atmost one entity in B is also associated with atmost one entity in A.

e**xample :**Relationship between the entities principal and college. i.e., Principals can lead a single college and a principal can have only one college.

2.Many – to – One relationship: An entity set in A is associated with atmost one entity in B, An entity in B however can be associated with any number of entities in A.

Example: Relationship between the entities class and student
 i.e a class can page4 page4 have many students but a student cannot be in more than one class at a time**.**

3.MANY – to – MANY relationship: An entity set in A is associated with any number of entities in B and an entity set in B is associated with any number of entities in A.

4.MANY – to – MANY relationship: An entity set in A is associated with any number of entities in B and an entity set in B is associated with any number of entities in A.

Example : Relationship between the Entities College and course .i.e. a college can have many courses and course can be offered by many colleges.

5.What is an attribute? Write about types in it.
Ans: properties of an entity is called Attribute.
 Types of attributes are
1.Simple Attribute or Atomic Attribute

 2.Complex/ composite attributes

 3.Single – valued attributes

4.Multi - valued attributes

5.Derived attribute

6.Null Attribute

7.Key Attribute

 1.**Simple attributes or Atomic Attributes :** These attributes have been simple; that is,they have not been divided into subparts.

 2.**Composite attributes are** attributes,which can be sub divided in to sub parts.

3.Single valued attributes are attributes that has only single value for an entity

4.Multi valued attributes: An attribute that can have multiple values for an entity is   known as **multi valued attribute.**

 5.Derived attribute: An attribute that can be derived from another attribute is known as   **derived attribute.**

6.Null Attributes: An attribute takes a null value when an entity does not have a value for it .

7.Key Attribute: An attribute that has unique value of each entity is known as **key attribute.**

Example, every student has unique roll no. Here roll no is **key attribute**

6..What is Key? Write about types of Keys.

Ans: Key is used for identifying unique rows from table. A key is an attribute that allows us to identify a set of attributes in an entity .

1.Primary Key − A primary key is a column or set of columns in a table that uniquelyidentifies tuples (rows) in that table. The Primary key of a relational table uniquely identifies each record in the table.

2.Super Key − A super key is a set of one of more columns (attributes) to

uniquely identify rows in a table. For example, the ′employee_id′ attribute of the entity set employee is sufficient to distinguish one employee entity from

another.Thus,'employee_id′is a superkey.

3.Candidate Key: A super key with no redundant attribute is known as candidate key.

4.Alternate Key Out of all candidate keys, only one gets selected as primary key,

remaining keys are known as alternate or secondary keys.

5.Composite Key: A key that consists of more than one attribute to uniquely identify rows

in a table is called composite key.

6.Foreign Key: Foreign keys are the columns of a table that points to the primary key of

another table. They act as a cross-reference between tables.

25.what are codd rules in relational model?

7.what are CODD rules of relational model?

:EFcodd formulated rules for the RDBMS which are 12 in number based upon we can decide a DBMS to be an RDBMS or not.

CODD rules are

0 – Single Foundation

Rule 1 – Information Rule

2 – Guaranteed Access

3 – Systematic Treatment of NULL values.

4 – Active online catalogue

5 – Comprehensive data sublanguage. 6 – View updation Rule

7 – High level UPDATE, INSERT, DELETE

8 – Physical Data Independence
 9 – Logical Data Independence
 10 – Integrity Independence
11 - Distribution Independence
12 – Non – Subversion

Rule 0 : Single Foundation Rule: RDBMS must manage every
aspect of the database entirely through itself, using its relational capabilities
without using any external language.

Rule 1 : Information Rule: The information can be represented in one and only
one way that is tables also known as relations.

Rule 2 : Guaranteed Access: The access to table follows the sequence of table
name, tuple attribute. This also states that at the intersection or each column and
row there should be one an only one value a data.

Rule 3 : Systematic Treatment of NULL values: One should be able to operate
with NULL values.

Rule 4 : Active On – Line catalogue: RDBMS should maintain data dictionary
tables to keep track of current state of the database.

Rule 5 : Comprehensive Data Sub Languages: RDBMS should have
comprehensive Data Definition Language, Data Control Language, Data
Manipulation Language.

S.No.	Chapter Name	Question	Marks
1	Data Communication	1. What is data communication? list types of data communication.	(2m)
		2. Define bandwidth.	(2m)
		3. Explain various types of data communications.	(6m)
		4. Write about various communication channels.	(6m)
2	Network types and topologies	1. Write various advantages of networks?	(2m)
		2. Expand BBN, GGN.	(2m)
		3. Expand LAN, WAN, MAN.	(2m)
		4. What is a network? Explain different types of computer network.	(6m)
		5. What is network topology? Explain about network topologies.	(6m)
3	LAN components	1. Define server and client.	(2m)
		2. What is Router?	(2m)
		3. Discuss briefly about hubs and switches.	(6m)

Unit 1: Data Communication

1. What is data communication? List types of data communication. (2m)

A) Data communication is the transmission of electronic data over some media. The media may be cables micro waves or fiber optics. Types of data communications are:

- Point to point communication
- Point to multipoint communication

(Or)

There are three types of data communication

- processor to processor
- personal computer to host computer
- personal computer to personal computer

2. Define bandwidth. (2m)

A) Bandwidth: Bandwidth means the amount of data that can be transformed from one point to another in a given time period (usually a second). Bandwidth is usually expressed in bits per second bps or bytes per second (Bps).
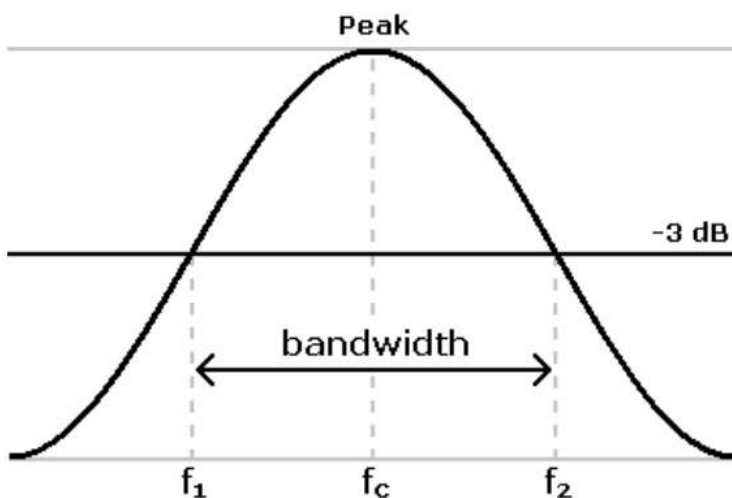
3. Explain various types of data communications. (6m)

A. There are two types of data communications

1. Point to point communication

2. Point to multipoint communication

1.point to point communication: point –to point connection refers to a communications connection between two nodes or end points. an example is a telephone call in which one telephone is connected with one other and what is

said by one caller can only be heard by the other.
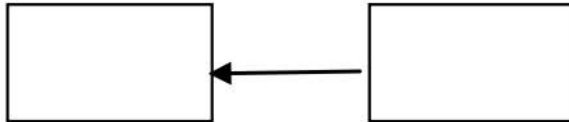
2. point –to-multipoint communication: point-to multipoint (PMP) communication refers to communication that is accomplished in the form of one-to-many connections, offerings several paths from one single location to various locations point-to-multipoint is generally abbreviated as PTMP, P2MP or PMP. Examples of point-to multipoint communication system are radio and television broadcasting.

(OR)
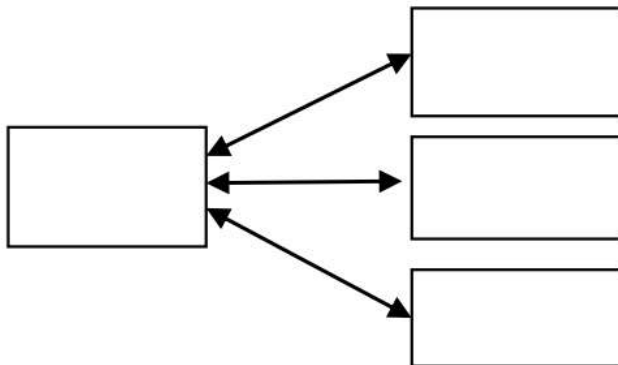
There are three types of Data Communication

1. Processor To Processor

2. Personal Computer to Host Computer

3. Personal Computer to Personal Computer

1. Processor To Processor: This communication normally refers to the communication between two or more computers to interchange large quantities of data such as bulk update of files or records and so on.

2. Personal Computer to Host Computer: The personal computer can send and receives and stores the information from another large computer which is normally the host computer.

3. Personal Computer to Personal Computer: Normally the personal computer can communicate with each other on a one-to-one basis. They exchange the information freely with one another this communication classified into two communications.

They are:
- Online Communication
- Offline Communication

Online Communication: In this communication a direct connection to mode between the device interchanging information and the transfer occurs almost intravenously.

Offline Communication: In this communication, the transfer of information is not immediate. The data is prepared for subsequent transmission.

4. Explain about various communication channels. (6m)

A) The communication channels are

1. Coaxial cable 2. Twisted pair 3. Microwaves 4. Fiber optics

1. Coaxial cable:

- Coaxial cable, also known as coax cable, is a type of cable that is used for transmitting high-frequency electrical signals.
- It consists of a copper conductor that is surrounded by a layer of insulation, a braided shield, and an outer jacket.
- Coaxial cable is commonly used for applications such as cable television, satellite television, and high-speed internet connections.
- It is also used in other applications that require high-speed data transmission, such as security cameras, home automation systems, and industrial control systems.
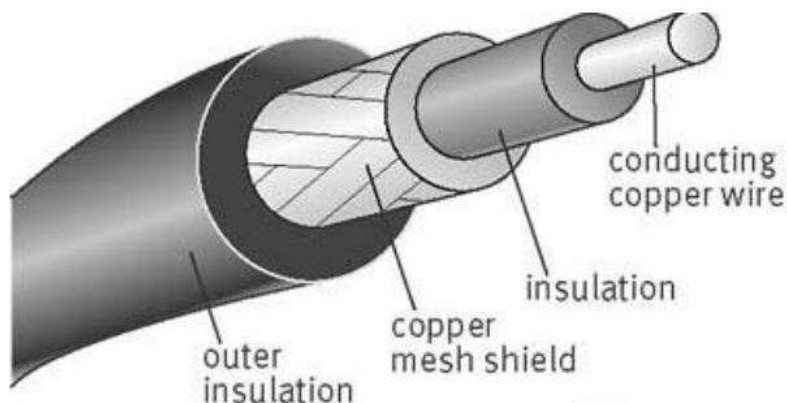
2. Twisted pair cable:

- A twisted pair consists of two insulated copper wires typically about 1mm thick. The wires are twisted together in a helical form.
- The purpose of twisting the wires is to reduce electrical interference (EMI) and crosstalk between the wires.
- Twisted pair is the ordinary copper wire that connects home and many business computers to the telephone communication.

Insulator ... Conductors
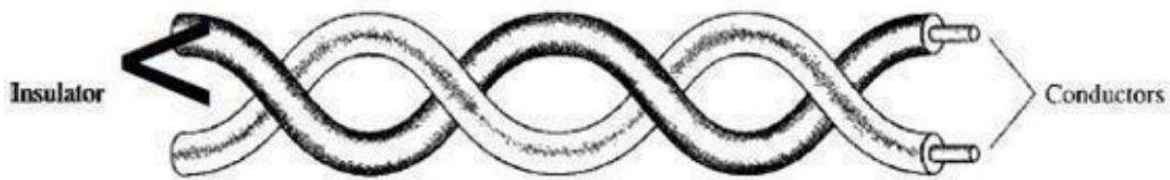
3.Microwaves:

- Microwave communication is a form of wireless communication that uses high-frequency radio waves to transmit information between two or more locations.
- These radio waves have wave lengths that range from approximately 1 millimeter to 1 meter, and frequencies between 300 MHz to 300 GHz.
- Microwave communication is used for a variety of purposes, including satellite communication, television & radio broad casting, cellular communication, and microwave links for point-to-point communication.
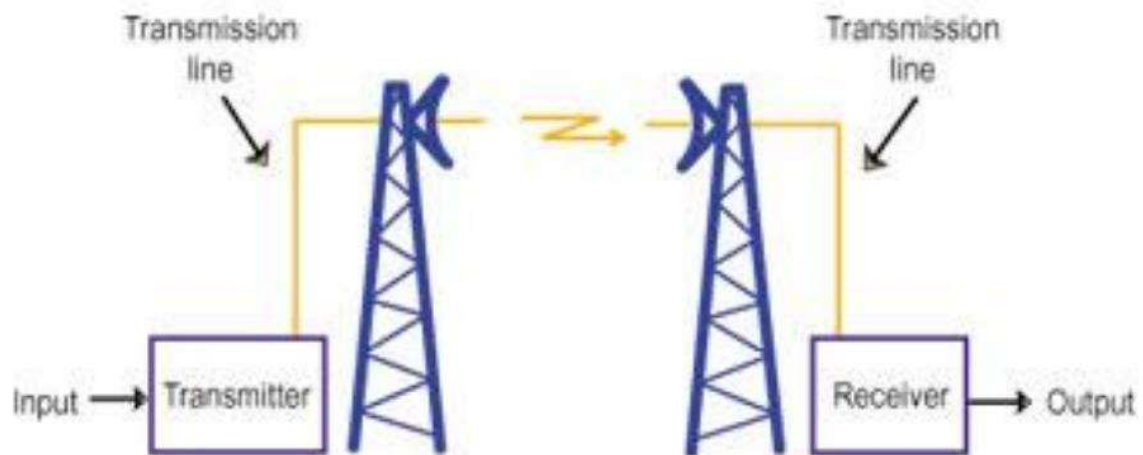
4. Optical Fiber Cable:

- Optical fiber cable is a type of cable made up of thin strands of glass or plastic fibers that are used to transmit data, voice, and video signals over long distances.
- The cable consists of a core, cladding, and coating, and works by transmitting light signals through the core, which reflects off the cladding and travels through the cable.

Optical-fiber cable
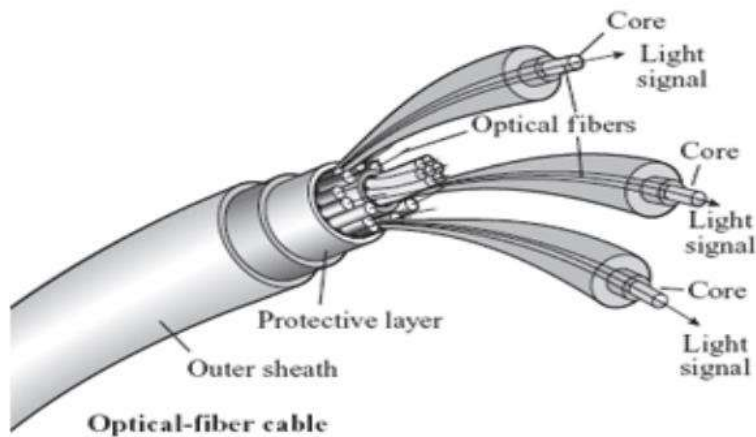
Unit 2: Network types and topologies

1. Write various advantages of networks? (2m)

A) Various advantages of networks: Networking of computers facilitates resource sharing, sharing of information, and can be used as a communication medium, and also for backup and support.

2. Expand BBN, GAN. (2m)

A) BBN: Back bone network

GAN: Global area network

3. Expand LAN, WAN, MAN. (2m)

A) LAN: Local area network

WAN: Wide area network

MAN: Metropolitan area network

4. What is a Network? Explain different types of computer networks. (6m)

A) A computer network is a group of computer systems and other hardware devices that are link together through communication channels to facilitate communication and resource sharing among a wide range of users.

Different types of computer networks depending upon the geographical area covered by a network, it is classified as:

1. Local Area Networks (LAN)

2. Personal Area Networks (PAN)

3. Home Area Networks (HAN)

4. Metropolitan Area Networks (MAN)

5. Wide Area Networks (WAN)

1. LAN (Local Area Net work): A LAN is a network that is used for communicating among computer devices usually within an office building or home. ⬚ Is limited in size, typically spanning a few hundred meters, and no more than a mile ⬚ Is fast with speeds from 10 Mbps to 10Gbps ⬚ Has lower cost compared to MAN's or WAN's

2. PAN(Personal Area Network) : A personal area network (PAN) is a computer network used for communication among computer devices, including telephones and personal digital assistants, in proximity to an individual's body.

3. Home area network (HAN): A Home Area Network (HAN) is a network contained within a user's home that connects a person's digital devices, from multiple computers and their peripheral devices to telephones, VCRS, television, video games, home security systems, smart appliances, fax machines and other digital devices that are wired into the network.

4. Metropolitan area network: It was introduced in 1980's. It is also known as man and uses the same technology as LAN. It is developed to extend its coverage over the enter city. It is mainly handled and operated by single private company.

5. WAN (Wide Area Network): WAN covers a large geographic area such as country, continent or even whole of the world. A WAN is two or more LANs connected together. To cover great distances, WANs may transmit data over leased high-speed phone lines or wireless link such as satellites . Multiple LANs can be connect together using devices such as bridges, routers or gateways, which enable them to share data. The world 's most popular WAN is the internet.

5. What is network topology? Explain about network topologies. (6m)

A) Network topology defines how the computers, or nodes, within the network are physically arranged and connected to each other.

Some common network topologies include ring, bus, star, tree and mesh configurations. These topologies are deferent below:

Ring Topology: In this topology Devices are connected from one to another to form a ring shape. Each host is connected to the next and the lost node is connected to the first. A data token is used to grant permission for each computer to communicate.

RING TOPOLOGY
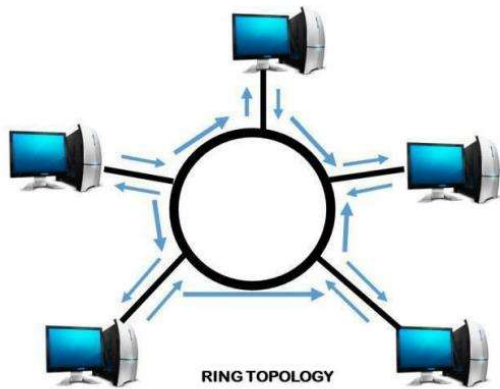
Bus Topology: In this topology, all hosts are connected to the backbone cable in a linear fashion.
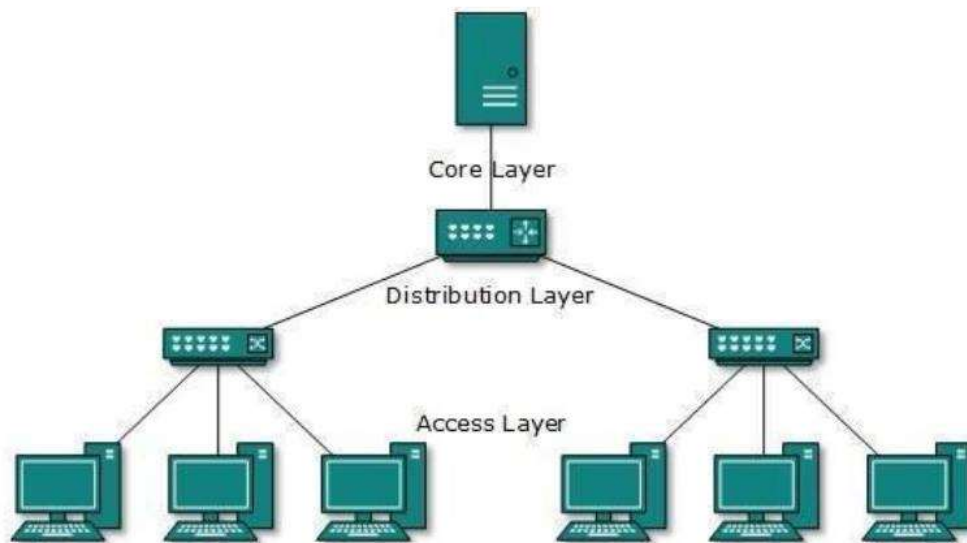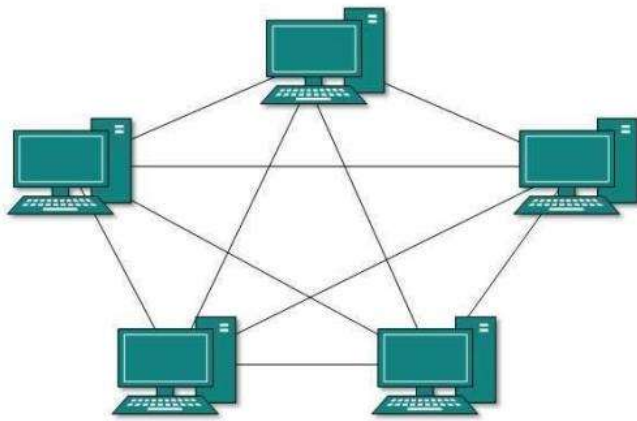
BUS TOPOLOGY
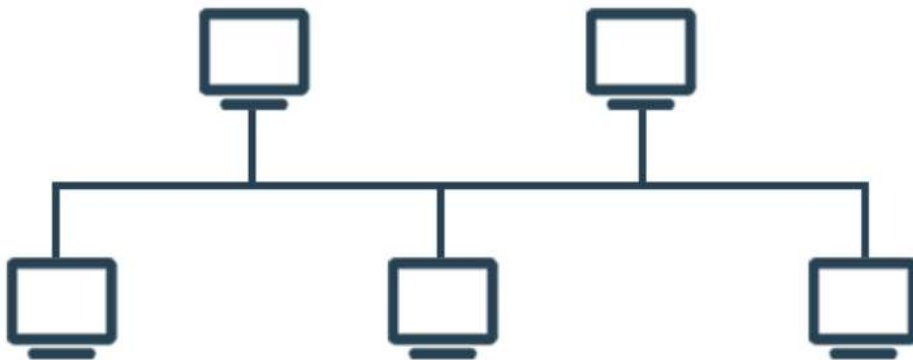
Star Topology: In this topology All hosts are connected to a single point of concentration. ⬛ Usually uses a hub or switch as a center node. ⬛ Range limits are about 100 meters from the hub. ⬛ Data on a star network passes through the hub or concentrator before continuing to its destination.
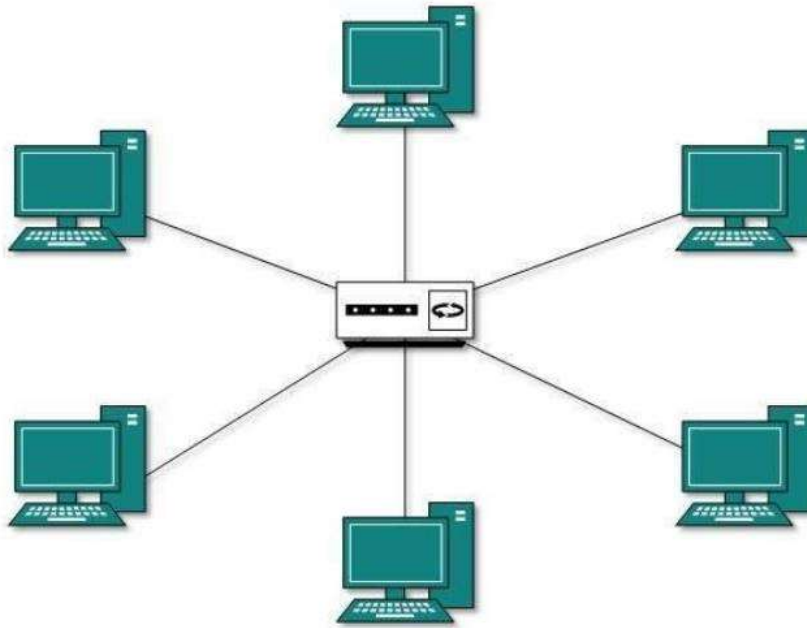
Tree Topology: One "root" node connects to others nodes, which in turn connect to other nodes, forming a tree structure. Information from the root node may have to pass through other nodes to reach the end nodes.


Mesh Topology: In this topology, each host is connected to all the other hosts.

Hybrid Topology: Hybrid topology is the collection of two or more different topologies which are discussed above. In the below example diagram you can find the star topology, ring topology and the bus topology.
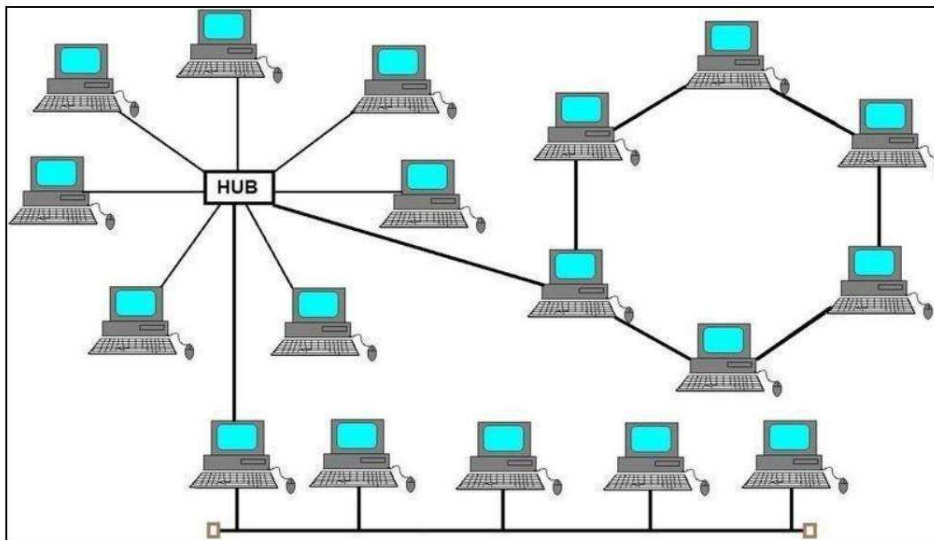
The Internet: The Internet is a worldwide collection of computer networks, cooperating with each other to exchange data using a common software standard. Through telephone wires and satellite links, Internet users can share information in a variety of forms.
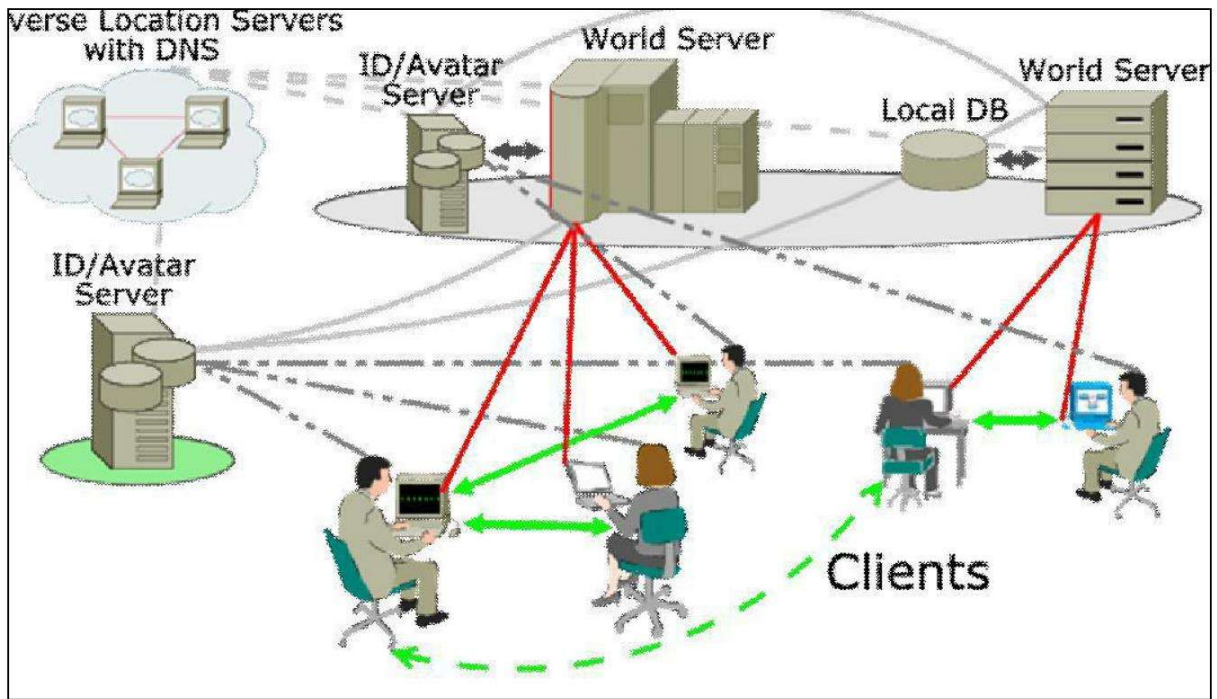
Unit 3: LAN components

1. Define Server and Client. (2m)

A) Server: A network server is a computer designed to process requests and deliver data to other (client) computers over a local network or the Internet.

Client: A client is a computer that accesses a service made available by a server.

2. What is Router? (2m)

A) Router: A Router is a device that forwards data packets along networks. A router is connected to at least two networks, commonly two LANS or WANS or a LAN and its ISP's network. Router reduces network traffic by using routing table.

3. Discuss briefly about Hubs and Switches. (6m)

A) Hub :

- A network hub acts as a centralized point for data transmission to computers in LAN.
- When data from one computer reaches the hub it is broadcast to every computer in the network regardless of where the data is intended to go.
- Network bandwidth on LAN using a network hub is shared, which means that four computers on a hub will each go one-quarter the total bandwidth available on the hub.
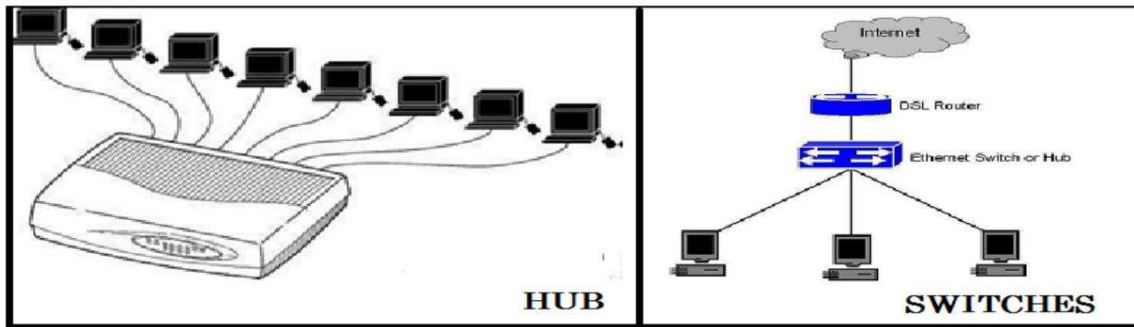
HUB   SWITCHES

Switches:

- An alternative to the network hub is the network switch.
- Switches represent a newer networking technology that assigns each computer in the network a specific MAC address.
- This allows LANs using a network switch to route information to individual computers.
- Because network switches do not broadcast to every computer on the network.
- They can simultaneously allot their full bandwidth to each computer.