DCC QUESTION BANK

Q.1

1.State the function of repeater and modem.

Ans: Function of repeaters

- A repeater is a device which operates only in the physical layer.
- All transmission media weaken the electromagnetic waves that travel through them.
- A repeater receives a signal and before it becomes too weak or corrupted, regenerates the original bit pattern.

Function of modem

- When a computer wishes to send digital data over an analog dial-up line, the data must first be converted to analog form for transmission over the local loop.
- This conversion is done by a device called a modem.
- The term modem is a composite word that refers to the functional entities that make up the device: a signal modulator and a signal demodulator.

2. List mobile generations.

Ans:1.First Generation (1G)

2. Second Generation (2G)

3. Third Generation (3G)

4. Fourth Generation (4G)

5. Fifth Generation (5G)

3. Draw the following topology with five host. i) Ring ii) Star

Ans: 1.Ring topology

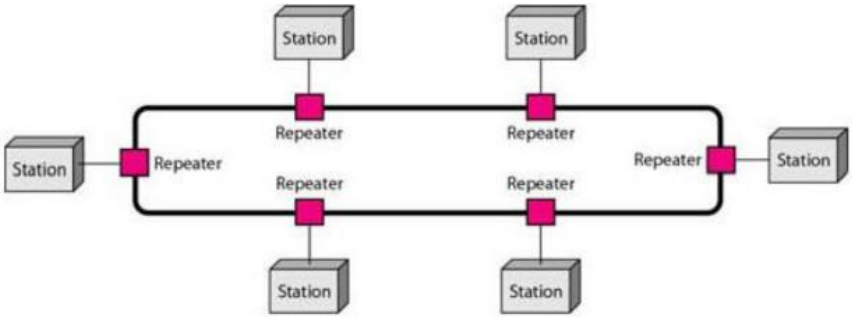


Fig: Ring Topology

2.Star topology

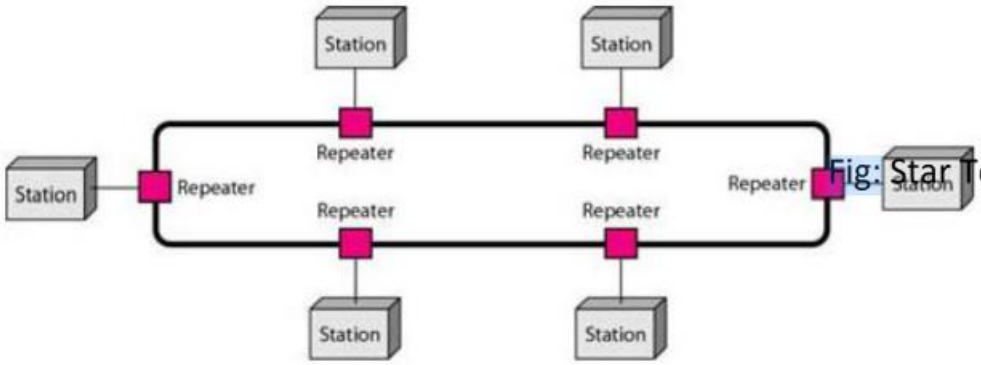
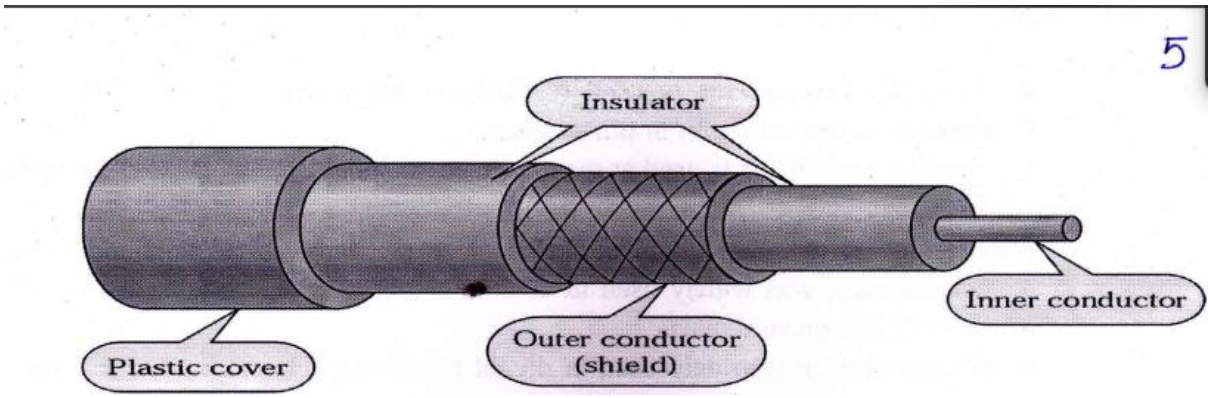


Fig: Star Topology

4. Draw a neat labelled diagram of co-axial cable

Ans:



5. List IEEE 802 X standards for networks

Ans: Different IEEE standards are:

• IEEE 802.1 Standards for LAN/MAN

• IEEE 802.2 Standards for Logical Link Control (LLC)

• IEEE 802.3 Ethernet Standards for Carrier Sense Multiple Access with Collision Detection (CSMA/CD)

• IEEE 802.4 Standards for token passing bus

• IEEE 802.5 Standards for token ring

• IEEE 802.11 Wireless LAN

6. Define multiplexing. List types of multiplexing./state its types.

Ans: Multiplexing is the set of techniques that allows the simultaneous transmission of multiple signals across a single data link. Multiplexing divides the physical line or a medium into logical segments called channels.in multiplexing ,different channels carry data simultaneously over the same physical medium.

There are three basic multiplexing techniques:

- Frequency-Division Multiplexing,
- Wavelength-Division Multiplexing
- Time-Division Multiplexing.

7. Define Error. Name types of Errors.

Ans: An Error is defined as the measure of the difference between the observed or calculated value of a quantity and its true value.

Types of error:

- Single-Bit Error
- Burst Error

8. List advantages and disadvantages of packet switched network.

- Ans: Advantages:
  1. Handling large data volumes.
  2. Security, reliability & speed which is not possible on PSTN.
  3. World wide access.
- Disadvantages:
  1. Each packet switching node introduces a delay.
  2. Overall packet delay can vary substantially.
  3. Each packet requires overhead information.
  4. More processing required at each node.

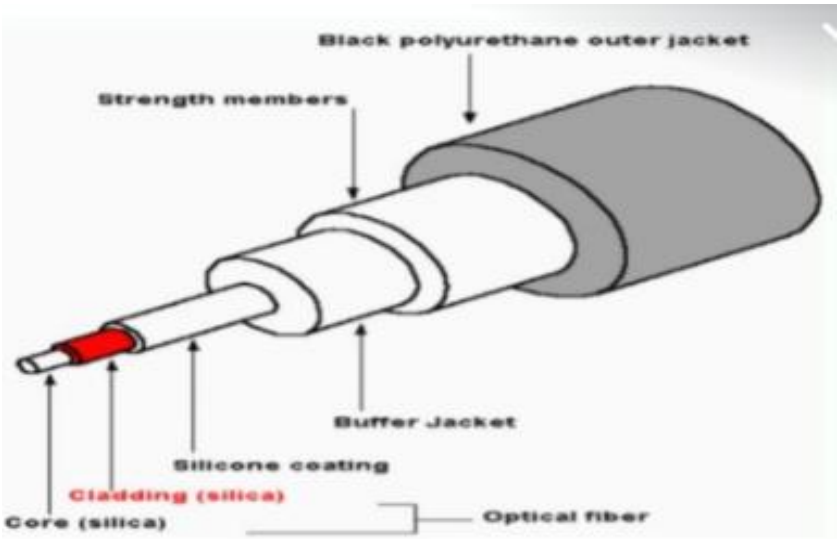
9. Compare STP &UTP on basis of noise, ease of handling, cost and speed.

Ans:

Parameter	STP	UTP
Noise	Less prone to noise	Prone to noise
Ease of handling	Easy	Hard
Cost	Costlier than UTP	Cheaper than STP
Speed	Supports higher speed than UTP	Supports slower speed than on STP

10. Draw a neat labelled diagram of Fiber-Optic cable

Ans:



11. List any four Unguided Transmission Media.

Ans:

- Propagation mode
- Microwave Communication
- Satellite Communication
- Communication Band

12. Compare LRC and VRC

Ans:

S.No.	Vertical Redundancy Check (VRC)	Longitudinal Redundancy Check (LRC)
1.	It stands for Vertical Redundancy Check.	It stands for Longitudinal Redundancy Check.
2.	In this redundant bit called parity bit is added to each data unit.	In this redundant row of bits is added to the whole block.
3.	VRC can detect single bit errors.	LRC can detect burst errors.
4.	It is also known as parity checker.	It is also known as 2-D parity checker.

13. What are different ways to correct errors?

Ans: In error correction, we need to know the exact number of bits that are corrupted and more importantly, their location in the message. The number of the errors and the size of the message are important factors.

14. write a short note on :Cyclic Redundancy check(CRC).

Ans: Cyclic Redundancy Check (CRC): An error detection mechanism in which a special number is appended to a block of data in order to detect any changes introduced during storage (or transmission).CRC is more powerful than VRC and LRC in detecting errors.

Q.2

1. Draw and explain the architecture of wireless LAN 802.11?

Ans:

• Wireless LANs are those Local Area Networks that use high frequency radio waves instead of cables for connecting the devices in LAN.

• Users connected by WLANs can move around within the area of network coverage.

• Most WLANs are based upon the standard IEEE 802.11 or WiFi.

• **There are two types of wireless networks:**

• Ad Hoc, where stations communicate directly;

• Infrastructure type networks where stations communicate through access points.

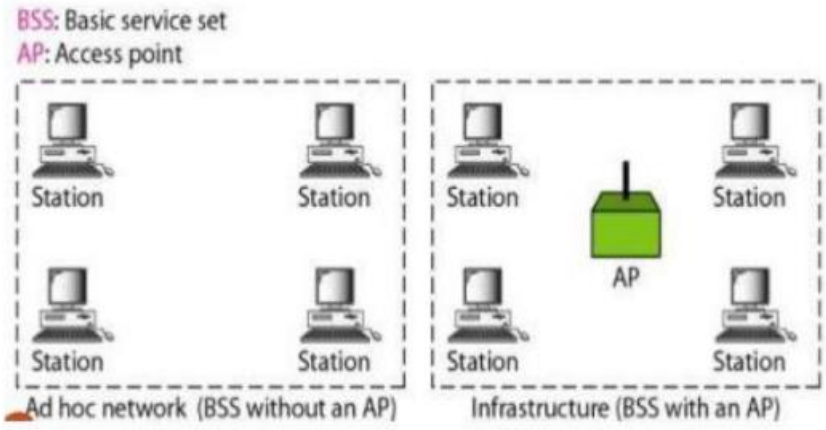
Basic Service Set (BSS):

1) The basic services set contain stationary or mobile wireless station and central base station called access point (AP)

2) The use of access point is optimal

3) If the access point is not present, it is known as standalone network. Such a BSS cannot such data to other BSSs. These types of architecture are known as adhoc architecture.

4) The BSS in which an access point is present is known as infrastructure network.

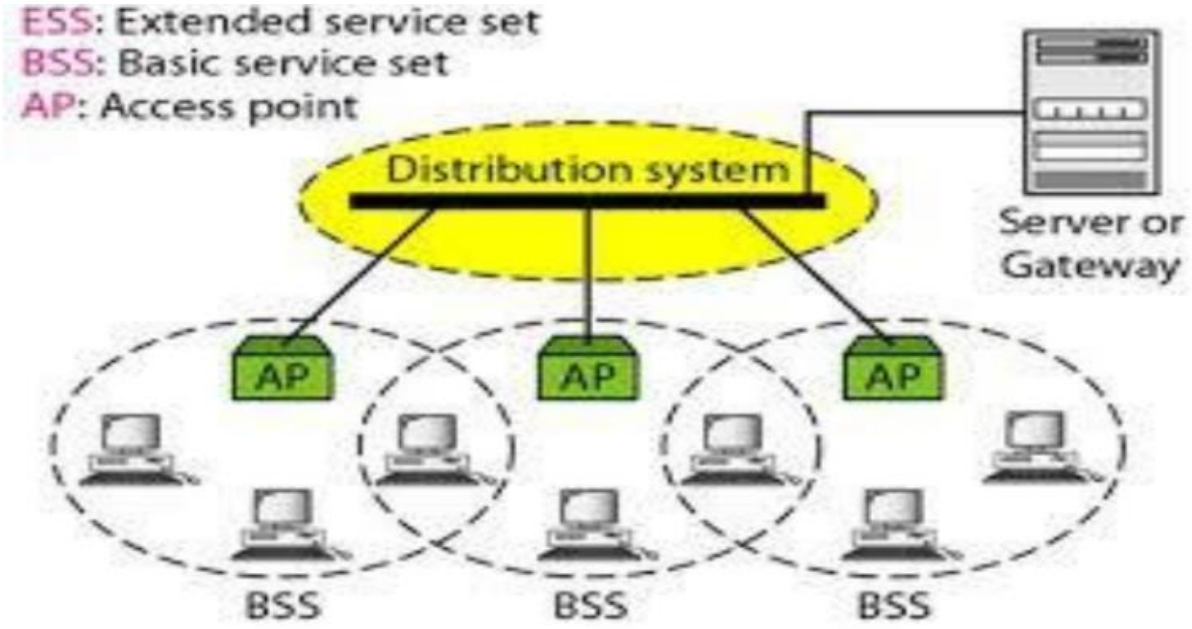


Extended Service Set (ESS):

1) An extended service set is created by initializing two or more basic services set (BSS) having access points (APS)

2) These extended networks are created by joining the access points of basic station set through a wired LAN known as distribution system.

3) The distribution system can be any IEEE LAN.



2. Design and explain in brief architecture for a network using tree topology for an office in a 3-storeys building.

Ans:

- A tree topology is a variation of a star. As in a star, nodes in a tree are linked to a central hub headed that controls the traffic to the network.

- Not every computer plugs into the central hub, majority of them are connected to a secondary hub which in turn is connected to the central hub as shown in following fig:

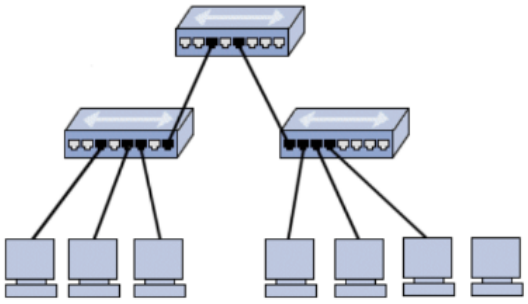


Fig: Tree Topology

- The central hub is active hub which contains repeater.
- The repeater amplifies the signal and increase the distance a signal can travel.
- The secondary hub may be active or passive. A passive hub provides a simple physical connection between the attached devices.

3. Explain any four factors to be considered while selecting a cable to establish a network.

Ans: not found

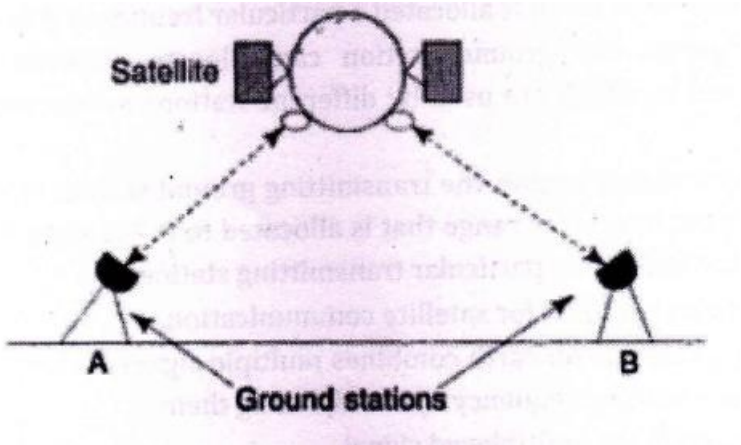
4. Compare different techniques of switching on the basis of Orientation, Flexibility,Technology, and Layer.

Ans:not found

5. Explain satellite communication with the help of neat diagram

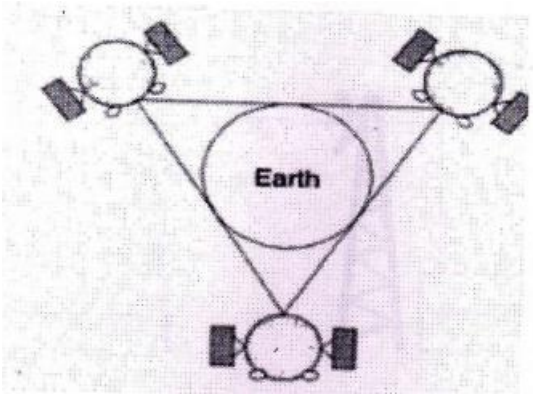
Ans:

- In satellite communication, the satellite acts as one of the stations.
- Following fig illustrate this.
- The satellite does the functions sf an antenna and the repeater together.
- As following fig. illustrates,.ground station A can send the information to ground station B via satellite.



- This poses a problem.

- If the earth along with its ground stations is revolving and the satellite is stationery the sending and receiving earth stations and the satellite can be out of sync over time.
- Therefore Geosynchronous satellites are used which move at same RPM as that of the earth in the same direction.
- However 3 satellites are needed to cover earth's surface entirely.



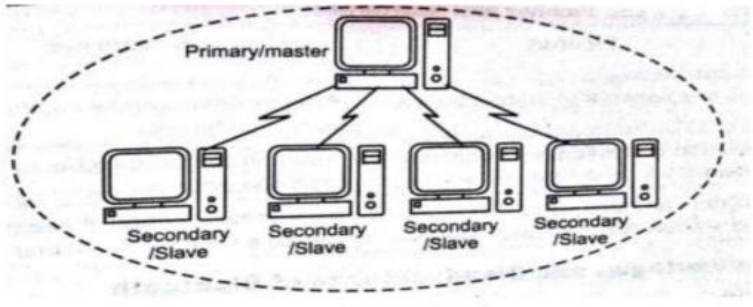
6. Explain Bluetooth architecture technologies.

Ans: Bluetooth architecture defines two types of networks:

1. Piconet

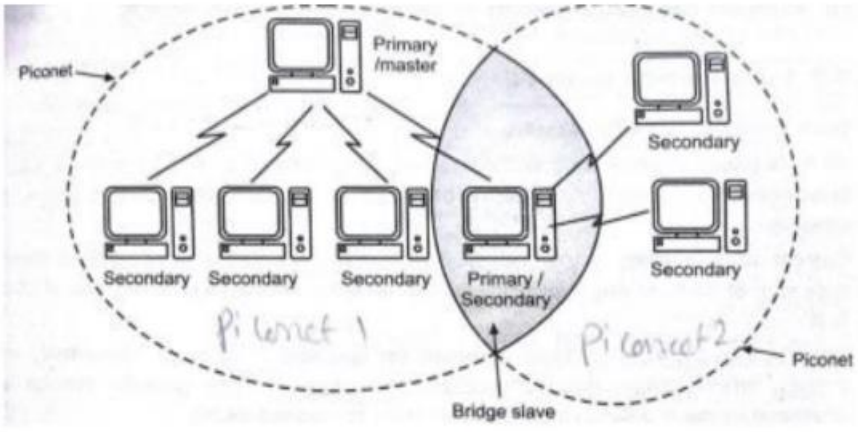
2. Scatternet

Piconet:- It is a Bluetooth network that consists of one primary (master) node and seven active secondary (slave)nodes. It can have 8 active nodes within the distance of 10 meter. Communication between primary and secondary can be one-to-one or one-to-many. All communication is between master and slave. There can be only one primary or master station in each piconet.



PICONET

Scatternet:- Scatternet is formed by combining various piconets. Slave in one piconet acts as a master or primary in other piconet. A node can receive messages from master in first piconet and deliver the messages to its slave in other piconet where it is acting as master. This node is called bridge slave. This node cannot be the master of two piconets.



Scatternet

7. Compare guided transmission and unguided transmission media.

Ans:

S. No.	Guided Media	Unguided Media
1.	The guided media is also called wired communication or bounded transmission media.	The unguided media is also called wireless communication or unbounded transmission media.
2.	The signal energy propagates through wires in guided media.	The signal energy propagates through the air in unguided media.
3.	Guided media is used for point-to-point communication.	Unguided media is generally suited for radio broadcasting in all directions.
4.	It is cost-effective.	It is expensive.

8. Select layer of OSI reference model in which following device operate: hub, bridge,router , repeater , gateway , switch

Ans:not found

9. Compare Hub & switch on the basis of layer, ports, device type, speed.

Ans:

Ans.

Parameter	Hub	Switch
Layer	Physical layer. Hubs are classifies as Layer 1 devices per the OSI model.	Data Link Layer. Network switches operate at Layer 2 of the OSI model
Ports	4/12 ports	Switch is multi port Bridges. 24/48 ports
Device type	Passive Device (Without software)	Active Device(With Software) & Networking device
Speed	All the lines coming into a hub must operate at the same speed.	

10. Describe working of Mesh topology. Give its advantages and disadvantages.

Ans:

- In mesh topology, every device has a dedicated point-to-point link to every other device.
- The tern dedicated means that the link carries traffic only between the two devices it connects.
- A mesh network has n(n-1)/2 physical channels to link n devices.

- Every device on the network must have n-1 input/output (I/O) ports.

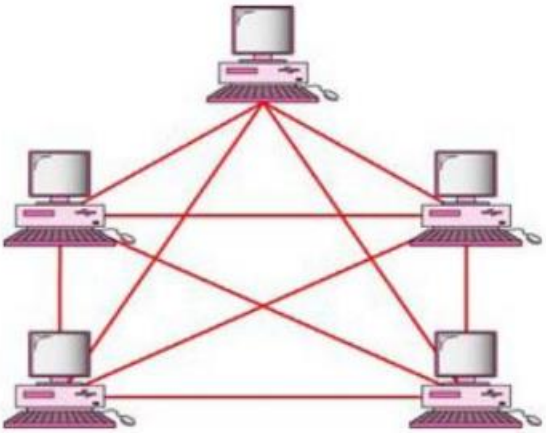


Fig: Mesh Topology

- Advantage

1. Less traffic.
2. Robust.
3. Secure.
4. Easy Fault isolation

- Disadvantage

1. Need more resource (cable and ports).
2. Expensive