

Wireless Communication

Assignment :- 1

Date:

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Q1) Write about Evolution of mobile network communications.

Ans - When we describe mobile communications, we refer to the overall technology, speed, frequency and system in numeric generations such as 3G, 4G or 5G.

- Each generation have unique technologies that define them.

- This blog explores and explains the differences throughout the evolution of mobile communication and what we can expect from the future generations of these technologies.

• 1G :- The very first generation of commercial cellular network was introduced in the late 70's with fully implemented standards being established throughout the 80's.

• 2G :- The second generation saw the introduction of GSM (Global System for Mobile Communication) technologies as a standard in the early 90's.

• 2.5G :- Between the year 2000 and 2003, an upgrade in technologies introduced the packet network which provided high speed data transfer and internet and became known as 2.5G. The standards included GPRS and EDGE.

- **3G:** Introduced commercially in 2001, the goals set out for third generation mobile communication were to facilitate greater voice and data capacity, support a wider range of applications, and increase data transmission at a lower cost.
- **4G:** Initiated in 2010, the fourth generation is an all IP based network system. Its purpose is to provide high speed, high quality and high capacity to users while improving security and lower the cost of voice and data services, multimedia and internet over IP.
- **5G:** It is the next generation of commercial cellular network, set to greatly increase internet connectivity speeds. At this time, there aren't any publicly agreed definitive standards that have been set as it with previous generations so not a great deal of information is known about the specific technologies that are going to be used.

2) Write note on Comparison of common wireless system in detail.

Ans) Wireless communication technology has an unseen impact on all of our lives each day. If you have a business, you may wonder how you can make the best use of the

Various types of wireless communication.

1. SATELLITE COMMUNICATION

- It is a crucial form of wireless communication because people all over the earth can communicate with each other.
- It may not be possible to send a signal to another country because, well, the curvature of the earth is in the way. This is one reason why satellites are orbiting the earth because they can send a signal amongst themselves and eventually to the distant country. All of this at an incredibly fast speed.

2. INFRARED COMMUNICATION

- It is present in most homes in the form of a television remote control.
- IR transmits information by means of invisible light. This means that on the electromagnetic spectrum it lies between microwaves and visible light.
- It requires a transmitter and a photoreceiver to receive the light beam. Since any disruption to the light will result in the photoreceiver not receiving it, IR will only function when there is a line of sight visibility. That means that if you stand between the transmitter and receiver it will probably not work.

3. Broadcast Radio

- Radio transmitters send out data in the form of radio waves to receiving antennae. Radio waves are forms of electromagnetic signals. Signals are relatively narrow, and waves can be sent across various frequencies. This is why your car radio is able to receive signals from many different radio stations.

4. Microwave Communication

- It has two types:-

- Satellite Microwave Comm.

↳ This requires a clear line of sight. This means that if you want to send a signal over a long distance, sending it up to a satellite first is a good idea.

↳ The only problem is that in very dense cloudy weather the signal to the satellite can be blocked by atmospheric.

- Terrestrial Microwave Comm.

↳ ~~Mic~~ It can be a very secure form of communication. If a signal needs to be transmitted over a short distance, it can be enough to erect two antennae with a clear line of sight.

↳ The signal can then be transmitted between the two receivers. This negates the need to connect to an outside network.

5. Wi-Fi

- It is a low powered wireless electronic network. These are available in almost every shopping mall and cafe in the world. Essentially a physical wired network is connected to a router. This creates a highly localized and low power wireless network.

6. Mobile Communication Systems

- The burgeoning mobile phone industry uses similar technology to Wi-Fi but on a much grander and safer scale. Mobile phone companies provide coverage to customers nationwide or even international scale.

7. Bluetooth Technology

- It is a simple method to send information across a short distance. However, this info. can include either messages or even files.

3. Explain Second generation Cellular Network Third Generation (3G) Wireless Networks in detail.

Ans - First of Second Generation Network is 2G and third Generation Network is 3G.

- Now, let discuss 2G and 3G in detail.

1. Second Generation (2G):

- ↳ 2G mobile network is based on GSM (Global System for Mobile Communication). This technology was developed in Finland in 1991. Messages are encrypted in this technology. Digital signals used in this technology use less battery and hence leads to less power consumption. Also provided data services for mobile phones. Advanced versions are 2.5G and 2.7G.

2. Third Generation (3G):

- ↳ 3G mobile network was developed in Japan in 2001 to achieve heights of speed which was lacking in 2G technology. The standards of this technology ~~provided~~ ~~was~~ was set by International Telecommunication Union (ITU). This technology provided users with services like GPS (Global Positioning System), video conferencing and mobile television.

4. Explain Wireless local loop (WLL), Wireless Local Area Network (WLAN) in detail.

Ans. • Wireless local loop (WLL)

- ↳ In a telephone network a wireless local loop is a generic term for an access system

that uses a wireless link to connect subscribers to the local telephone station in place of conventional copper wire.

↳ In Fixed Wireless Access System the wireless local loop is popular, WLL is also called as Fixed wireless loop.

• ↳ The function of a WLL is to make primary access to local telephone station using wireless link.

↳ There are two types of concepts:

• Narrowband WLL - offers a replacement for existing telephony services

• Broadband WLL - provides high-speed two-way voice and data service.

↳ Thus, WLL is the best system to handle high data traffic in the local loop system.

• Wireless Local Area Networks (WLANs)

↳ It provides broadband telecommunications access in the local exchange, driven by demand for broadband Internet access from business and homes due to the

rapid growth of the Internet.

- ↳ Provide high speed, high performance wireless connections between computers and the wireless access points, between laptops, between laptops and printers, scanners, video cameras and other electronic in local area or at home.
- ↳ Replace the cumbersome cords that connect devices to one another.
- ↳ Operate at low power and licence free spectrum,
 - North America: IEEE 802.11x series, example! Wi-Fi
 - Europe: HIPERLAN/2
 - Both IEEE 802.11a and HIPERLAN/2 support up to 54Mbps
 - Use spread spectrum and OFDM technologies