LESSON NOTES 8

Year/Level: 12   **Subjects: Computer Studies**

| **Strand:**	Computer and Applications
Sub-strand:	CE 12.1.5 Communications and Networks
Content Learning Outcome:	❖ Communication and connectivity ❖ Communication system (connection device, data transmission specification)

Lesson Notes

3. **Connection Devices**
   ❖ Are devices that connect the devices to the communication channels for data to be transmitted for example, a modem, network interface card (NIC) switch and routers
   ❖ Since the computer understands digital language, everything that is sent and received must be in 0's and 1's.

   Modulation-demodulation

   ❖ convert the digital signal from the computer into analog signal from the sending computer and converts the analog signal back into digital signal on the receiving computer

   Analog – telephone signals; continuous electronic wave
   Digital – computer signals; presence or absence of an electronic pulse; on/off
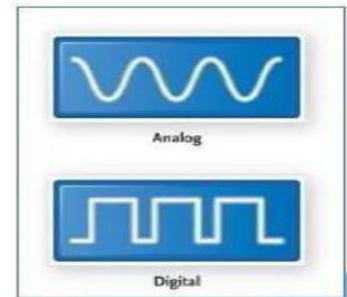
Types of Modems

Modem
   ❖ Are used to connect with an Internet service provider, and can also be used to send fax transmissions.
   ❖ The types of available modems include:
      Analog
         • modems are used for dial-up connections
      Digital subscriber line (DSL)
         • are high-speed broadband connections
      Cable and Integrated Services Digital Network (ISDN)
         • Transfer information in channels of 64 kilobits per second (Kpbs) which can be combined for higher speeds.

Telephone can be either internal or external; connects computer directly to a telephone line.

DSL (Digital Subscriber Line) – uses standard phone lines; external and uses either USB or Ethernet ports.

Cable uses coaxial cable – same as your television; uses either USB or Ethernet ports. Wireless also known as WWAN (wireless wide area network modem) does not use cables.

Signals are sent through the air where transfer speed or transfer rate is measured in bits per second; the higher the speed the faster the transfer rate.

4. Data transmission specifications
   ❖ Specify the rules and speeds at which data is transmitted over the network.
   ❖ Protocols and bandwidth specify the rules and speed respectively.

   Protocols
   ❖ Are rules for exchanging data between computers
   ❖ The standard protocol for the internet is TCP/IP (transmission control protocol/Internet protocol)

   TCP/IP is a two-layer protocol
   I. The higher layer, Transmission Control Protocol, manages the assembling of a message or file into smaller packets that are transmitted over the Internet and received by a TCP layer that reassembles the packets into the original message. This process is known as **packetization.**

   II. The lower layer, Internet Protocol, handles the address part of each packet so that it gets to the right destination. Each gateway (router/server) on the network checks this address to see where to forward the message. Even though some packets from the same message are routed differently than others, they will be reassembled in the original order at the destination. This process is known as **identification**. TCP/IP uses domain name servers (DNS) that converts the numeric based IP address into text based address.

   Bandwidth is the capacity of the communication channel that determines the volume of data that can be transmitted in a given amount of time. Bandwidth is measured in bits per second (bps)

   There are four categories of bandwidth:
   Voice band
   - Also known as low bandwidth is used for standard telephone communication.
   - It is effective for transmitting text documents however it is too slow for many types of transmission, including high-quality audio and video.

   Medium band
   - Is used in special leased lines to connect servers as well as transmit data over long distances.
   - This band width is capable of very high-speed data transfer.

   Broadband
   - Is widely used for DSL, cable and satellite connections to the internet.
   - Several users can simultaneously use a single broadband connection for high-speed data transfer.

   Baseband
   - Is widely used to connect individual computers that are located close to one another.
   - Like broadband, it is able to support high-speed transmission. Unlike broadband, however, baseband can only carry one signal at a time.

Question

1) Discuss what is meant by **packetization and identification?**

2) State the long form of TCP/IP?

3) Define the term bandwidth?

4) List three types of modem?