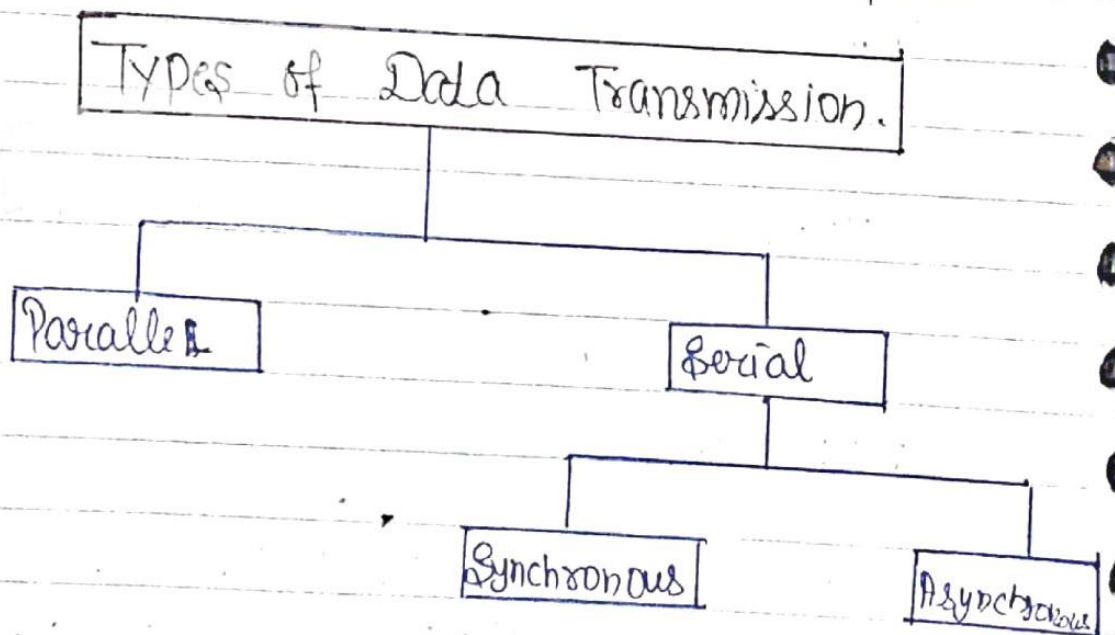# Data Transmission.

- Data Transmission refers to the movement of data in form of bits between two or more digital devices.

- The transfer of data takes place via some form of transmission media.
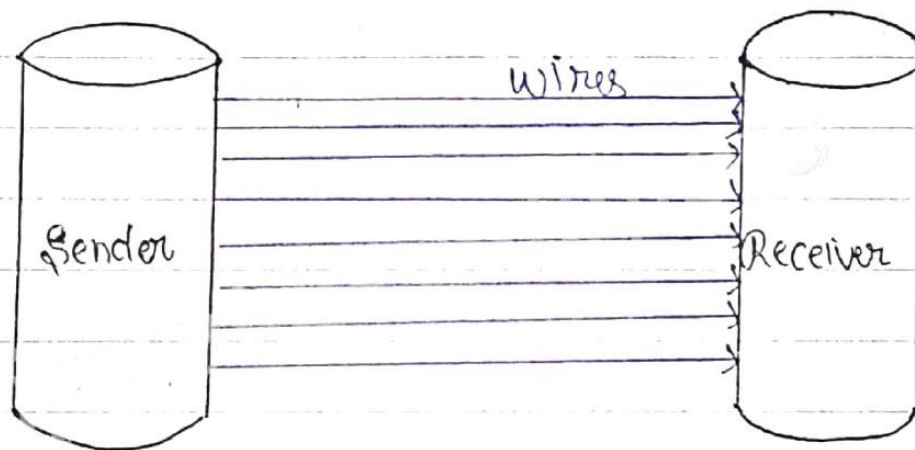 For example :- coaxial cable, fiber optics.

```
              Types of Data Transmission.
                          |
          ┌───────────────┴───────────────┐
      Parallel                          Serial
                                          |
                              ┌───────────┴───────────┐
                          Synchronous              Asynchronous
```

1: Parallel Transmission. :-

→ In Parallel Transmission, all the bits of data are transmitted simultaneously on separate communication lines.

→ It means, it shares multiple data bits at a similar time over separate media.

→ Parallel transmission can be used with a wired channel that uses multiple, separate wires.

(Parallel Transmission that uses 8 wires to send 8 bits at the same time.

→ It is used for short distance communication

→ In this, eight separate wires are used to transmit 8 bit data from Sender to Receiver).

→ In order to transmit n bits, n wires or lines are used. Thus each bit has its own lines.
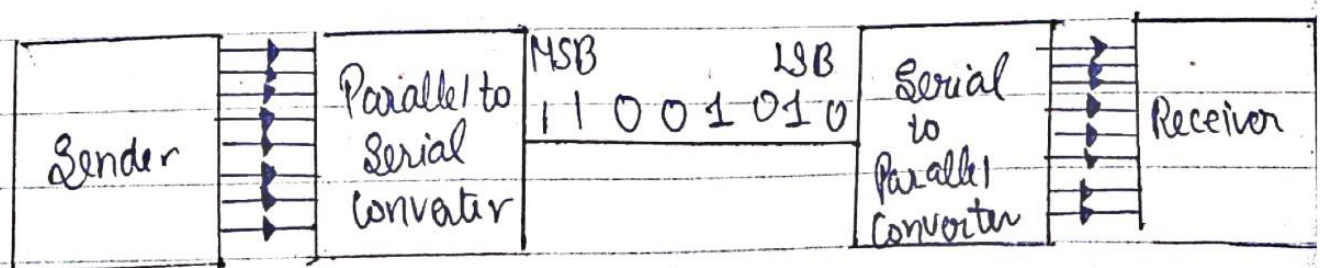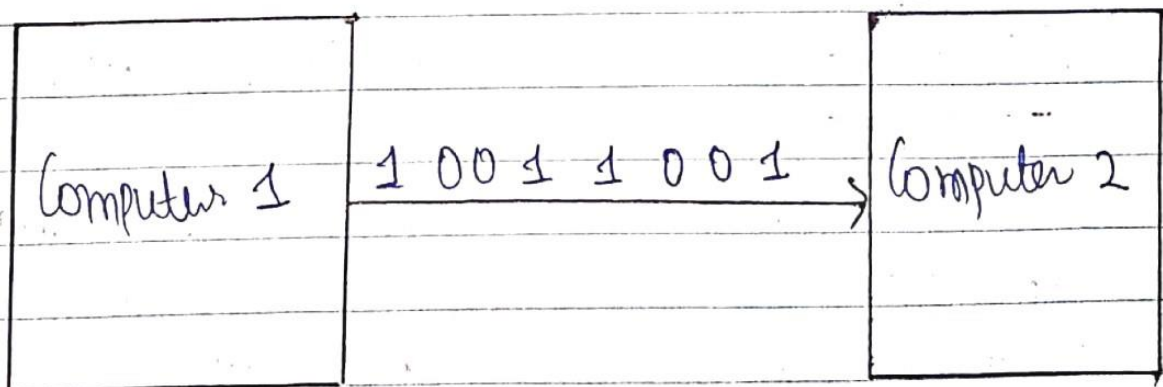
→ **Advantages of Parallel Transmission :-**

(i) It can transmit N bits at the same time.

(ii) It is speedy way of transmitting data.

(iii) Multiple bits are transmitted simultaneously with a single clock pulse.

→ **Disadvantages of Parallel transmission :-**

→ It is costly method of data transmission.

→ It requires n lines to transmit n bits at the same time.

→ It is usually limited to shorter distances

2 Serial Transmission :-

→ The alternative of Parallel transmission, called Serial transmission.

→ In serial transmission, the various bits of data are transmitted serially one after another.

→ All of bits of data are transmitted on single line in serial fashion.

→ It requires only one communication line.

→ In Serial Transmission, 8 bits are transferred at a time having a start and stop bit.

| Computer 1 | 1 0 0 1 1 0 0 1 → | Computer 2 |

| Sender | | Parallel to Serial Converter | MSB   LSB
1 1 0 0 1 0 1 0 | Serial to Parallel Converter | | Receiver |

Source end

→ Suppose an 8-bit data 11001010 is to be sent from source to destination.

The LSB i.e. 0 will be transmitted first first followed by other bits. The MSB i.e. 1 will be transmitted in the end via single communication line.

* Advantage of Serial Transmission :-

→ Serial Transmission is used for Long distance communication.

→ Serial Transmission is cost-efficent.

→ The circuit used in Serial Transmission is simple.

* Disadvantages of Serial Transmission :-

→ This method is slower as comparison to parallel transmission as bits are transmitted serially one after the other.

→ It is not cost efficent.

* Comparison between Serial and Parallel Transmission

SNO	Basis for Comparison	Serial Transmission	Parallel Transmission
1.	Defination	Data flows in 2 directions, bit by bit.	Data flow in multiple directions 8 bits at a time.
2.	Number of bits transferred Per clock pulse	One bit	8 bit or 1 byte or n bits.
3.	Number of Lines required to transmit n bits	One line	n lines
4.	Speed	Slow	fast
5.	Cost	Low (as one line is required)	Higher (as n Lines are required)
6.	Applications	Used for long distance Communication	used for short distance communicate
7.	Example	Computer to Computer	Computer to printer

STUDYBYNOTES