

5) OFDM → Orthogonal Frequency Division Multiplexing

→ It is a method of digital data modulation, whereby a single stream of data is divided into several separate sub-streams for transmission via multiple channels.

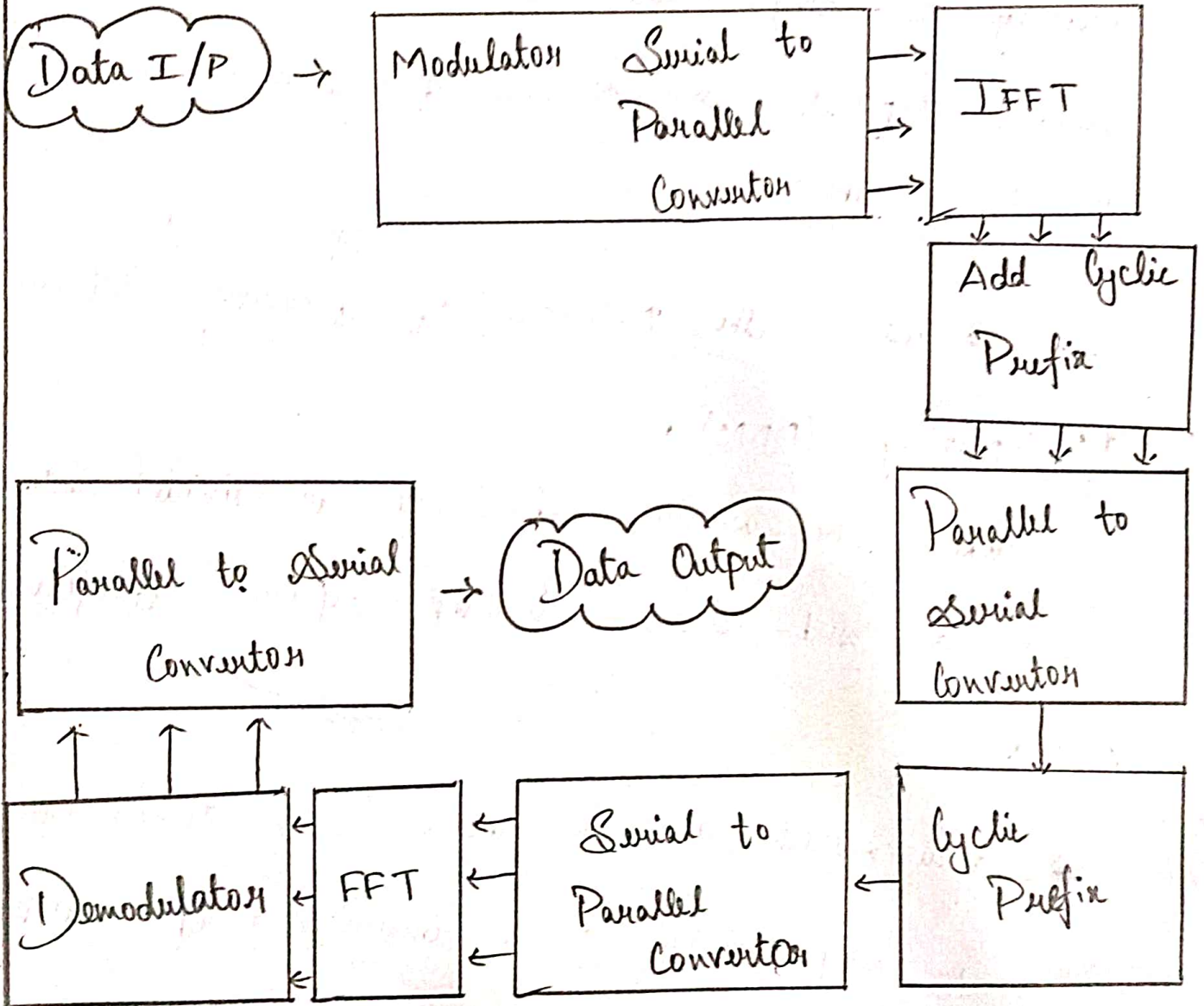
→ It uses the principle of frequency Division Multiplexing (FDM),

where the available bandwidth is divided into a set of sub-streams having separate frequency bands.

→ It is mostly used in wireless data transmission but may be employed in wired and fiber optic communication as well.

→ In wireless communications, OFDM has become an alternative to single carrier modulation techniques such as FDMA, TDMA and CDMA.

→ It is used in applications including digital video broadcasting, digital audio broadcasting, digital cable television.



Uses :-

* Used in Digital radio, Digital Radio Mondiale, digital audio broadcasting and Satellite radio.

*) Used in Wired data transmission, ADSL-
Asymmetric Digital Subscriber Line.

*) Used in Wi-fi, DSL internet access, digital television, radio broadcast services.

Working Principle of OFDM

i) OFDM is a specialised FDM having the constraint that the sub-streams in which the main signal is divided, are orthogonal to each other.

ii) Orthogonal signals are perpendicular to each other.

iii) Main property of these signals is that they do not interfere with each other.

iv) When any signal is modulated by the sender, its sidebands spread out either side.

v) A receiver can successfully demodulate the data only if it receives the whole signal.

vi) Orthosignals are used in OFDM, no interference occurs between the signals, ~~even~~ even if their side bands overlap.

vii) So, guard bands can be removed, thus saving bandwidth.

viii) In order that OFDM works, there should be very accurate synchronization between the communicating nodes.

If frequency deviation occurs in the sub-streams, they will not be orthogonal any more, due to which interference between the signals will occur.

