Multiplexing

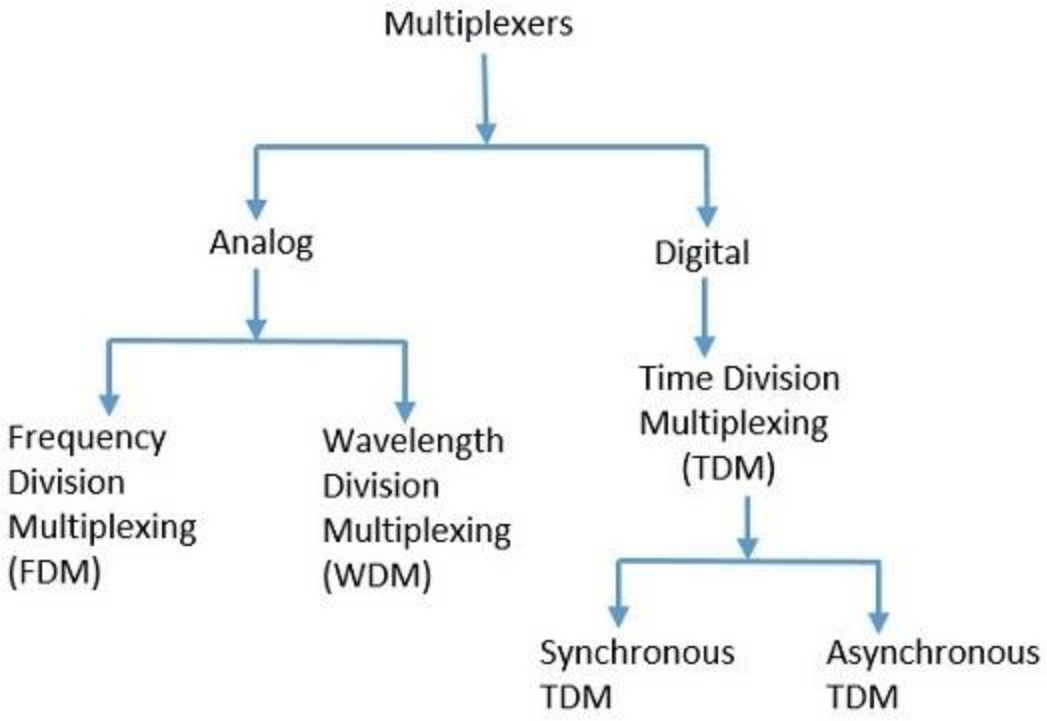
Multiplexing is the process of combining multiple signals into one signal, over a shared medium. If the analog signals are multiplexed, then it is called as analog multiplexing. Similarly, if the digital signals are multiplexed, then it is called as digital multiplexing.

Multiplexing was first developed in telephony. A number of signals were combined to send through a single cable. The process of multiplexing divides a communication channel into several number of logical channels, allotting each one for a different message signal or a data stream to be transferred. The device that does multiplexing can be called as Multiplexer or MUX.

Multiplexing and Demultiplexing

Types of Multiplexers

There are mainly two types of multiplexers, namely analog and digital. They are further divided into Frequency Division Multiplexing (FDM), Wavelength Division Multiplexing (WDM), and Time Division Multiplexing (TDM). The following figure gives a detailed idea about this classification.



What is the Difference between FDM TDM and WDM?

FDM vs TDM vs WDM		
FDM is a transmission technique in which multiple data signals are combined for simultaneous transmission via a shared communication medium.	TDM is a transmission technique that allows multiple users to send signals over a common channel by allocating fixed time slot for each user.	WDM is a transmission technique that modulates numerous data streams, optical carrier signals of varying wavelengths into a single light beams through a single optical fiber.
Functionality		
FDM divides the bandwidth into smaller frequency ranges an transmitsser transmit data simultaneously through a common channel within their frequency range.	TDM allocates a fixed time slot for each user to send signals through a common channel. User gets the entire bandwidth within that time slot.	WDM combines multiple light beams from several channels and combine them to a single light beam and sends through a fiber optic strand similar to FDM.
Stands for		
FDM stands for Frequency Division Multiplexing.	TDM stands for Time Division Multiplexing.	WDM stands for Wave Length Multiplexing.

Type of Signals		
FDM uses analog signals.	TDM uses digital and analog signals.	WDM uses optical signals.