



BUBT
Committed to Academic Excellence

**BANGLADESH UNIVERSITY OF
BUSINESS AND TECHNOLOGY**

Assignment on Multiplexing

Course Code: CSE 209

Course Title: Data Communication

Submitted to:

Name: Dr. Kamruddin Md. Nur
Associate Professor
Dept. of CSE
at Bangladesh University of Business
and Technology.

Submitted by:

Name: Syeda Nowshin Ibnat
ID: 17183103020
Intake: 39
Section: 01
Program: B.Sc. in CSE

Date of Submission: 11.05.2020

Q1. What are the difference between Multiplexing and Demultiplexing?

Answer:

Multiplexing is method or technique in which multiple signals are combined into one signal that travels on a medium. Demultiplexing is totally reverse of multiplexing in demultiplexing a signal is again decomposed in individual signals. The basic difference between multiplexing and demultiplexing are given below.

Multiplexer (MUX)

1. It have so many inputs & one output.
2. It also be called MUX
3. In mux the selection of particular input is controlled by set of selection lines.
4. Parallel to serial conversion.
5. When we design multiplexer, we don't need additional gates.
6. Examples: (8 input 1 output), (16 input 1 output), (32 input 1 output).

Demultiplexer (DEMUX)

1. For demultiplexing purpose it has One inputs & many output.
2. It also be called DEMUX.
3. In DEMUX selection of output line is controlled by bit values of n selection lines
4. Serial to parallel conversion.
5. Additional gates are included when designing de-multiplexer.
6. Examples: (1 input 8 output), (1 input 16 output), (1 input 32 output).

Q2. When do you need Multiplexing and Demultiplexing?

Answer:

Multiplexer (Mux):

A Multiplexer is used in numerous applications like, where multiple data can be transmitted using a single line.

- **In Communication System:** increase the efficiency of the communication system by allowing the transmission of data, such as audio and video data transmission.
- **In Computer Memory:** keep up a vast amount of memory in the computers and decrease the number of copper lines necessary to connect the memory to other parts of the computer as well.
- **In Telephone Network:** integrate the multiple audio signals on a single line of transmission.

- **Transmission from the Computer System of a Satellite:** A Multiplexer is used to transmit the data signals from the computer system of a satellite to the ground system by using a GSM communication.

Demultiplexer (Demux):

- **In Communication System:** receives the output signals from the multiplexer and converts them back to the original form at the receiver end.
- **In Arithmetic Logic Unit:** The output of the arithmetic logic unit is fed as an input to the Demux, and the o/p of the Demux is connected to a multiple register.
- **In Serial to Parallel Converter:** The serial to parallel converter is used to reform parallel data. In this method, serial data are given as an input to the Demux and a counter is attached to the Demux to sense the data signal at the Demux's o/p. When all data signals are stored, the output of the Demux can be read out in parallel.

Q3. Compare different Multiplexing techniques - FDM, WDM, TDM.

Answer:

Multiplexing is a technique in data transmission. It is to take multiple signals and combine them to a composite signal so that it transmits over a signal communication channel. FDM, TDM, and WDM are three multiplexing techniques. The comparison among FDM, WDM, TDM are given bellow:

FDM	TDM	WDM
FDM divides the bandwidth into smaller frequency ranges and each user transmits 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.	WDM combines multiple light beams from several channels and combine them to a single light beam and sends through a fiber optic strand.
FDM uses analog signals	TDM uses digital and analog signals	WDM uses optical signals