SNS COLLEGE OF TECHNOLOGY

An Autonomous Institution

Coimbatore-35

Accredited by NBA – AICTE and Accredited by NAAC – UGC with 'A++'
Grade
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

19ECB301-ANALOG AND DIGITAL COMMUNICATION

III YEAR/ V SEMESTER

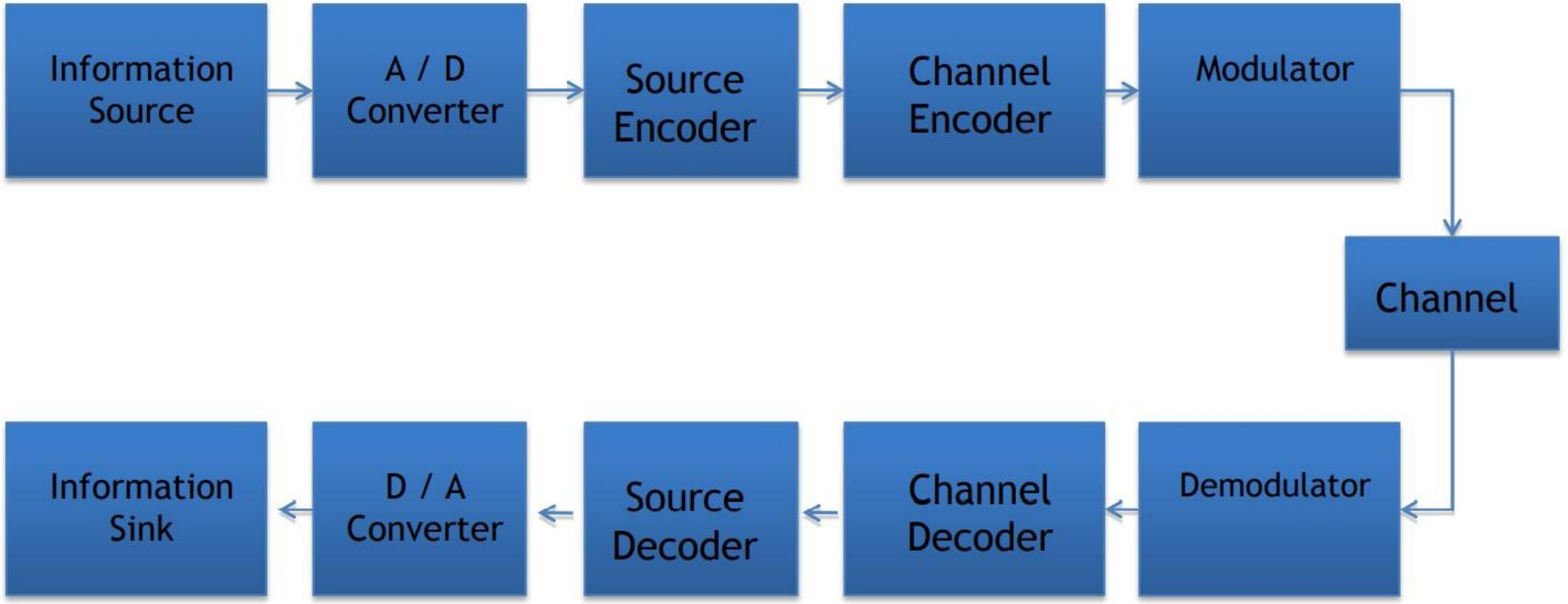
UNIT 3 – DIGITAL COMMUNICATION

TOPIC – BLOCK DIAGRAM OF DIGITAL COMMUNICATION

BLOCK DIAGRAM OF COMMUNICATION SYSTEMS

Block Diagram of a typical communication system

BLOCK DIAGRAM OF DIGITAL COMMUNICATION



BLOCK DIAGRAM OF DIGITAL COMMUNICATION

- Information source
  - Analog Data: Microphone, speech signal, image, video etc…
  - Discrete (Digital) Data: keyboard, binary numbers, hex numbers, etc…
- Analog to Digital Converter (A/D)
  - Sampling:
    - Converting continuous time signal to a digital signal
  - Quantization:
    - Converting the amplitude of the analog signal to a digital value
  - Coding:
    - Assigning a binary code to each finite amplitude

BLOCK DIAGRAM OF DIGITAL COMMUNICATION

- Source encoder
  - Represent the transmitted data more efficiently and remove redundant information
    - How? “write Vs. rite”
    - Speech signals frequency and human ear “20 kHz”
  - Two types of encoding:
  - Lossless data compression (encoding)
    - Data can be recovered without any missing information
  - Lossy data compression (encoding)
    - Smaller size of data
    - Data removed in encoding can not be recovered again

BLOCK DIAGRAM OF DIGITAL COMMUNICATION

- Channel encoder:
  - To control the noise and to detect and correct the errors that can occur in the transmitted data due the noise.
- Modulator:
  - Represent the data in a form to make it compatible with the channel
    - Carrier signal “high frequency signal”
- Demodulator:
  - Removes the carrier signal and reverse the process of the Modulator

BLOCK DIAGRAM OF DIGITAL COMMUNICATION

- Channel decoder:
  - Detects and corrects the errors in the signal gained from the channel
- Source decoder:
  - Decompresses the data into it's original format.
- Digital to Analog Converter:
  - Reverses the operation of the A/D
  - Needs techniques and knowledge about sampling, quantization, and coding methods.
- Information Sink
  - The User

WHY SHOULD WE USE DIGITAL COMMUNICATION ?

- Ease of regeneration
  - Pulses “ 0 , 1”
  - Easy to use repeaters
- Noise immunity
  - Better noise handling when using repeaters that repeats the original signal
  - Easy to differentiate between the values “either 0 or 1”
- Ease of Transmission
  - Less errors
  - Faster !
  - Better productivity

WHY SHOULD WE USE DIGITAL COMMUNICATION ?

- Ease of multiplexing
  - Transmitting several signals simultaneously
- Use of modern technology
  - Less cost !
- Ease of encryption
  - Security and privacy guarantee
  - Handles most of the encryption techniques

DISADVANTAGES

- The major disadvantage of digital transmission is that it requires a greater transmission bandwidth or channel bandwidth to communicate the same information in digital format as compared to analog format.
- Another disadvantage of digital transmission is that digital detection requires system synchronization, whereas analog signals generally have no such requirement.

ASSESSMENT

1.Define Digital Communication

2.What is meant by Sampling?

3.Mention the advantages of Digital Communication

THANK YOU