

### INFORMATION AND COMMUNICATION TECHNOLOGY

#### Introduction to ICT

ICT (Information and Communication Technology) is the magic behind our digital world. It involves using computers, phones, and the internet to share information, talk to friends, play games, and more. ICT connects us with people globally, helps us find answers, and learn new things online. Using our devices, we explore the exciting world of ICT, making life easier and more fun!

ICT helps improve people's capabilities in various fields, such as:

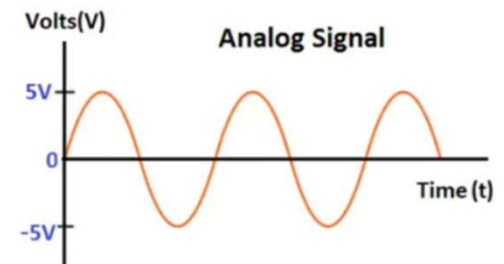
- Business
- Education
- Health
- Entertainment
- Society

## INFORMATION AND COMMUNICATION TECHNOLOGY

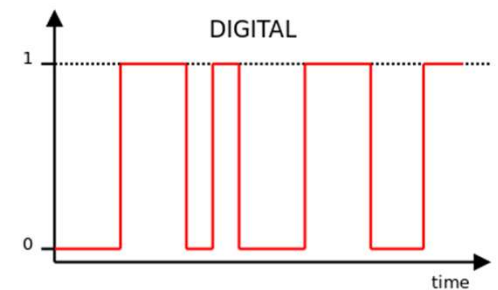
## Introduction to Signal

**Signal:** A signal is an electromagnetic wave that carries messages, data, or information from one system or network to another. Signal is of two types, i.e., analog signal and digital signal.

**Analog signal:** The signal that represents the physical quantity which changes continuously with time is called an analog signal. It is denoted by a sine wave. For example, the voltage signal from  $-5\text{V}$  to  $+5\text{V}$ .



**Digital signal:** The signal that represents the physical quantities which are discrete in value and time. Digital signal is denoted by a square wave. For example, the voltage signal that represents  $0\text{V}$  or  $5\text{V}$ .



## INFORMATION AND COMMUNICATION TECHNOLOGY

## Digital Units

**Units of computer memory and Inter-relationship between them:**

- 4 Bits = 1 Nibble
- 8 Bits = 2 Nibble = 1 Byte
- 1024 Bytes = 1 kiloByte (KB)
- 1024 KB = 1 MegaBytes (MB)
- 1024 MB = 1 GigaBytes (GB)
- 1024 GB = 1 TeraBytes (TB)

**Bit:** A bit भनेको computer मा data को सबैभन्दा सानो रूप हो। यो binary digit को short form हो र यो 0 या 1 मध्ये कुनै पनि हुन सक्छ।

## INFORMATION AND COMMUNICATION TECHNOLOGY

**Baseband Transmission**

Baseband transmission is the method of sending digital signals over a communication medium without modulating them onto a higher frequency carrier wave. In other words, the digital signals are transmitted in their original form. This type of transmission is typically used for short distances.

**Broadband Transmission**

It is the transmission of digital signal in the channel after converting digital signal into analog signal. This type of transmission is done for a long distance. The transmission of broadband internet through different equipment is broadband transmission



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**Components of a Digital Communication System:**

- 1.Source:** The origin of the information or data to be communicated, such as text, audio, or video.
- 2.Input Transducer:** Converts the original information into an electrical signal. For example, a microphone converts sound waves into electrical signals.
- 3.Encoder:** Compresses and encodes the electrical signal into a digital format. This step may involve analog-to-digital conversion and data compression.
- 4.Modulator:** Converts the digital signal into a form suitable for transmission over the communication channel by modulating a carrier wave.
- 5.Channel:** The medium through which the modulated signal is transmitted. This can be a wired connection like fiber optics or a wireless connection like radio waves.
- 6.Demodulator:** Receives the modulated signal from the channel and converts it back into a digital signal by demodulating the carrier wave.
- 7.Decoder:** Decompresses and decodes the digital signal back into its original electrical form. This step may involve error correction and digital-to-analog conversion.
- 8.Output Transducer:** Converts the decoded electrical signal back into a usable form, such as a speaker converting electrical signals into sound waves.
- 9.Output Signal:** The final form of the transmitted information, suitable for interpretation by the end user.

## INFORMATION AND COMMUNICATION TECHNOLOGY

**Digital Citizenship:** Being an active and responsible member of the online community. This means using the internet in a safe, respectful, and ethical way, while participating in digital activities like social media, online forums, and other digital spaces.

**Netizen:** A person who frequently uses and interacts with the internet and social media. Netizens are engaged in online communities, share content, and communicate with others through various digital platforms.

**Online Reputation:** How people see and judge you based on what you do and share online. Your online reputation is shaped by your activities, posts, and interactions on the internet, which can influence how others perceive your character and trustworthiness.

**Digital Wellbeing:** Maintaining a healthy balance with technology, focusing on your *mental, emotional, social, and physical health* while using digital devices and online platforms. It involves managing screen time, ensuring positive online interactions, and using technology in a way that supports your overall well-being.