What is a signal?
A **signal** is a time-varying quantity that carries information.

Define Digital signal.
A **digital signal** is a discrete-time signal that represents data using binary values (0s and 1s).

Differentiate between:
Bit and Bytes

Bit	Byte
Smallest unit of data, represented as **0 or 1**.	A group of **8 bits**.
Cannot represent a character on its own.	Can represent a character (like 'A', '5', etc.).
Data transfer speed is often measured in bits per second (bps).	Storage size is usually measured in bytes (KB, MB, GB).

Analog signals and digital signals

Analog Signals	Digital Signals
Continuous signals that vary smoothly over time.	Discrete signals represented in binary (0s and 1s).
More prone to noise and distortion.	Less affected by noise, more reliable for transmission.

Analog communication and Digital communication

Analog Communication	Digital Communication
Information is transmitted using continuous signals.	Information is transmitted using discrete binary signals.
Provides lower quality and is more affected by noise.	Provides higher quality, secure, and noise-resistant communication.

Give reasons:

1. Digital transmission is advantageous over analog transmission

Because it is less affected by noise and distortion, provides higher accuracy, allows error detection and correction, and supports higher speed with secure transmission.

2. Digital technology has greatly improved communication system

Because it enables fast and reliable data transfer, supports global connectivity through the internet, allows multimedia communication (voice, video, text), and ensures secure and efficient storage and retrieval of information.

3. Your online reputation can affect your future

Because employers, colleges, or organizations often check digital footprints, and a positive or negative reputation online can influence career opportunities, trust, and social relationships.

4. Digital technology has made life easier and comfortable

Because it simplifies daily tasks through automation, provides instant access to information and services, improves healthcare, education, and business, and saves time and effort in communication and work.

Answer these questions in detail.

b. **Write down the advantages of digital transmission.**

Advantages of Digital Transmission

Noise immunity – Less affected by noise and distortion; ensures clearer communication.

Error detection and correction – Errors can be detected and corrected using coding techniques.

Efficient bandwidth usage – Multiple digital signals can share the same channel using multiplexing.

Security – Digital signals can be encrypted for safe transmission.

Compatibility with computers – Easy storage, processing, and transmission with digital devices.

Compression capability – Data can be compressed to save bandwidth and storage.

Consistent quality – Signal quality does not degrade over long distances.

Scalability – Easily integrated with modern technologies like internet, 4G/5G, and IoT.

c. Explain any four examples of use of digital technology in daily life.

Four Examples of Use of Digital Technology in Daily Life

Communication

Digital technology allows instant communication through smartphones, emails, social media, and video calls.

Example: Messaging apps like WhatsApp or video calls via Zoom help people stay connected globally.

Education

Digital tools support online learning, virtual classrooms, and access to educational resources.

Example: Platforms like Google Classroom, Khan Academy, or online courses make learning flexible and interactive.

Banking and Finance

Digital technology enables online banking, mobile payments, and digital wallets, making financial transactions faster and safer.

Example: Mobile apps like eSewa, PayPal, or online banking apps allow money transfer without visiting a bank.

Healthcare

Digital systems help in patient management, telemedicine, and medical record keeping.

Example: Hospitals use electronic health records (EHR), and patients consult doctors online via telehealth services.