

Q1) what is a signal

→ A signal is defined as a function of one or more independent variable which contain's some information.

→ A signal may be a function of time, temperature, position, distance etc.

→ In electrical science a signal is from of voltage or current.

→ In electronic there may be TV signal, Radio signal, computer signal.

Signal classification:-

(1) one dimension signal:-

→ signal depend of single variable

(2) multidimension signal:-

→ signal depend of two more variable.

→ classification of signal based of on the nature of characteristic of time base two type.

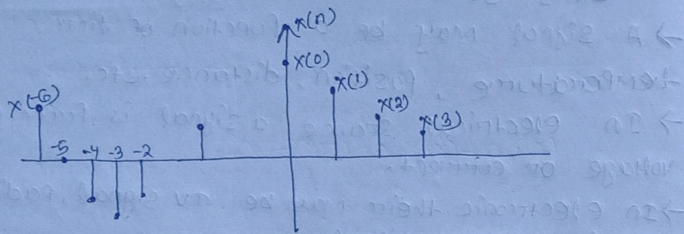
(1) continuous time signal

(2) discrete time signal.

Continuous time signal:- A continuous time signal may be defined as a mathematical continuous function this function is define continuously in the time table distek.

Discrete time signal:-

A Discrete-time signal is defined only at certain time-instants.

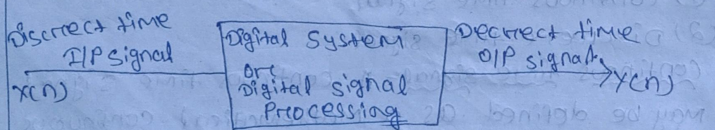


Digital Signal Processing:-

Application:-

→ This Processing, Event Processing, Radar signal Processing, Digital communication, Spectral analysis, Transmission line, Optical fibre system, telecommunication, telephone.

→ DSP is a numerical Processing of a signal from a digital computer here is on mother data Processing Method.



Signal Processing System:-

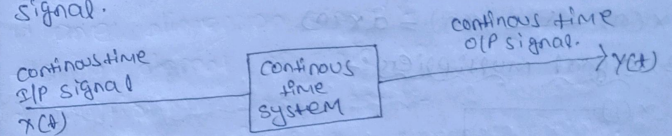
→ A basically system respond to Particular signal by Producing other signal having some detected behaviour.

→ Signal Processing depend of the type of signal to be Process.

(a) continuous time system

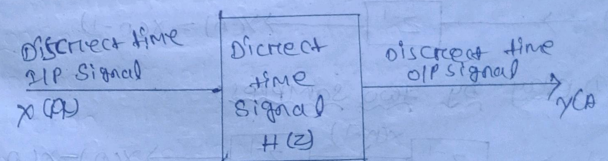
(b) Discrete time system.

Continuous time system - continuous time system for goes system for which i/p and o/p continuous time signal.



Discrete time system:-

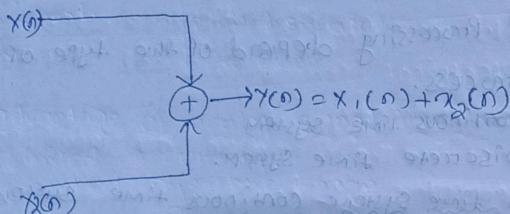
Those system for which i/p and o/p signal are Discrete time signal.



[symbol used to represent discrete]

Time System:- (1) adder, (2) constant multiplier, (3) unit Delay, (4) delay by two samples, (5) unit by two samples, (6) unit Advance

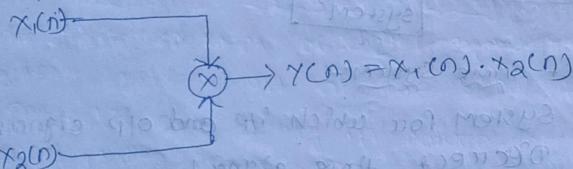
Adder:-



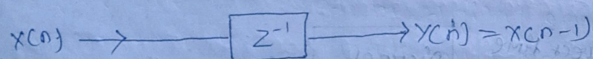
(2) constant multiplier:-

$$x(n) \rightarrow y(n) = a \cdot x(n)$$

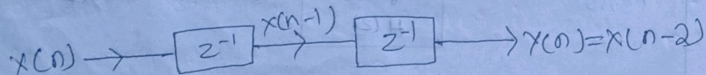
(3) signal multiplier:-



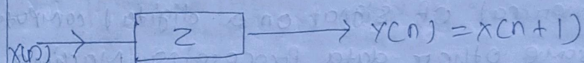
(4) unit Delay:-



(5) Delay by two samples:-



(6) unit Advance



consequence of signal processing:-

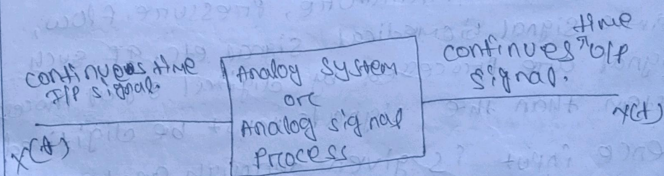
→ changing basic nature of signal to gate the di setting the i/p signal is know as signal processing.

(1) Analog signal processing

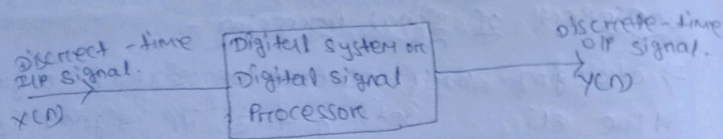
(2) Digital signal processing

Analog signal processing:-

→ In analog signal processing continuous time signal are proceed different type of analog signal are proceed to low pass Filter, high pass Filter, band pass Filter, and band reject Filter to gate the desired shaping of the i/p signal.



Q2) Digital Signal Processing:- Digital signal processing is a numerical of signal on a digital computer or a some other data processing machine.

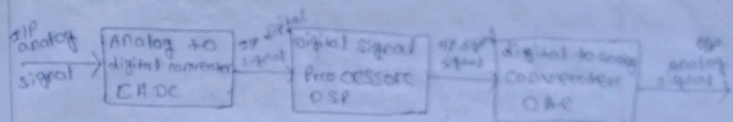


Disadvantage of analog signal processing:-

- 1) Limited accuracy.
- 2) Limited dynamic range.
- 3) Limited Processing speed.
- 4) Lack flexibility
- 5) High cost
- 6) Limited.

Basic Elements of Digital signal processing:-

→ The basic element of digital signal processing system. system most of the signal processing generated are analog in nature. For example sound, video, temperature, pressure, flow, seismic signal biomedical signal etc. If such signal are processed by digital signal processing system then the signals must be digitized hence input is given through analog-to-digital converter and output is obtained through digital-to-analog converter.



Analog to digital converter:- The ADC converts analog I/P to digital I/P. This signal is processed by a DSP system. The ADC converter determines sampling rate and quantisation error in digitising operation.

Period and non-period signal:-

→ A signal is a repeat after a fixed time period is called as a periodical signal.

→ The period of the signal can be define

$$x(t) = x(t + T_0)$$

Non-period signal:-

→ Signal which does not repeat after a fixed time period is called a non-period signal or aperiodic signal.

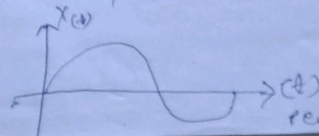
$$x(t) \neq x(t + T_0)$$

Period discrete time signal:-

→ For the discrete time signal the condition of periodicity is $x(n) = x(n + N)$

Non period discrete time signal

$$x(n) \neq x(n + N)$$



$$x(t) = A \sin \omega t$$

periodic signal