

# Digital Signal Processing Lab

## Experiment 2: Generation of Continuous and Discrete Time Signal

### I Pre Lab

1. Define Continuous time signal.

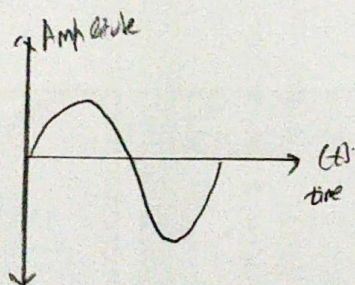
Soln. A signal of Continuous amplitude is called Continuous signal or analog signal, when it has values at every instant of time. In Continuous time signal variable of time is Continuous.  
eg: Sine wave, Cosine wave etc.

2. How is discrete time signal generated?

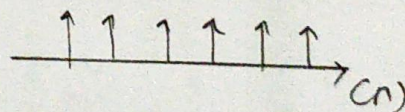
Soln. Discrete time signal is obtained by sampling a sequence at uniformly spaced times, it has an associated sampling rate. Discrete time signals may have several origins but can usually be classified into two groups by acquiring values of an analog signal at a constant or variable rate.

3. Draw the graphical representation of Continuous time signal and discrete time signal.

Soln.



Continuous Time Signal



Discrete Time Signal

### II Post Lab Questions:

1. Write any three diff between analog and digital signal.

Soln. Analog signal

1. They are Continuous
2. Represented by sinusoidal waves
3. Continuous Range of Values

Digital signal

1. They are discrete
2. Represented by square type wave
3. Discontinuous range of values.



2. Write code to generate discrete signal for time interval  $5\mu s$  and  $7\mu s$  using  $\sin$  function.

Soln.  $n = 0.000005 \times 2/1000000 = 0.000007$

$x = \sin(7 \times n) + \sin(10 \times n);$

$\text{subplot}(1,1,1);$

$\text{plot}(n, x, \text{style} = \text{'r'});$

$\text{xlabel}('n');$

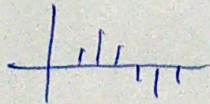
$\text{ylabel}('x(n)');$

$\text{title}('Discrete Time Signal');$

3. Give advantages of digital signal over analog signal.

- Soln.
- i) Digital signal is more secure and they do not get damaged by noise.
  - ii) They allow signals transmitted over a lengthy distance.
  - iii) Digital signals enable the transmission of multi directional content.
  - iv) By using these signals we can translate the message audio, video into device language.

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