Section A Notes

Signal:- Dependent variable or function of one or more independent variables.

$f(x_1, x_2 \dots x_n)$

↓ Signal

↳ independent variable.

Example:- A.C → is a signal because current is changing with change in time.

D.C → is not a signal there is a change in current is constant or current is constant

1) Single variable signal / 1D signal:-
Is a signal which depend upon single variable or it is a function of only one variable.
Ex:- $f(x)$, $g(x)$ etc

2) Multivariable signal / 2D signal:-
These are the signal which depends upon more than one variable
Ex:- $f(x_1, x_2)$, $f(x_1, x_2, x_3)$ etc.

Classification of signal

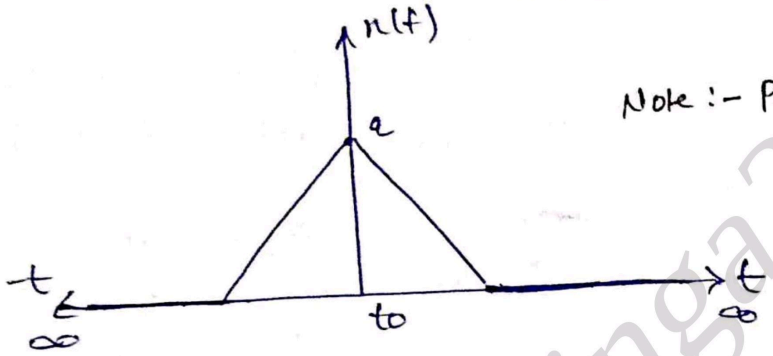
- Continuous time signal
- Discrete time signal

Continuous time Signal [CTS] :- Specified for every value of time

Representation :- $x(t)$

t → Independent variable.

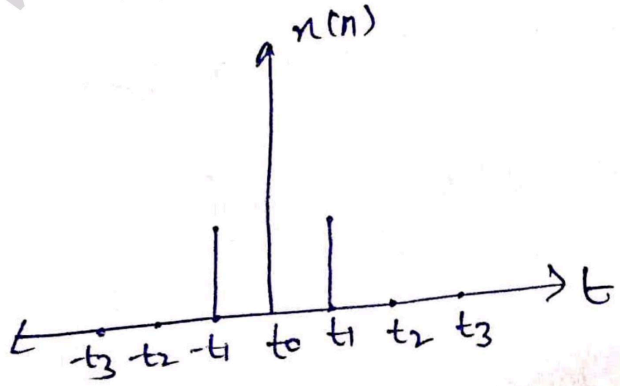
x → dependent variable



Note :- Practically the signal is inclining with time, because you can't reverse the time.

Discrete Time Signal [DTS] :- Specified at discrete time (certain or) intervals. It is not specified for every value to time (t)

Representation → $x(n)$ where n = integer, x = function / d. variable.



$\Delta t = t_1 - t_0$.

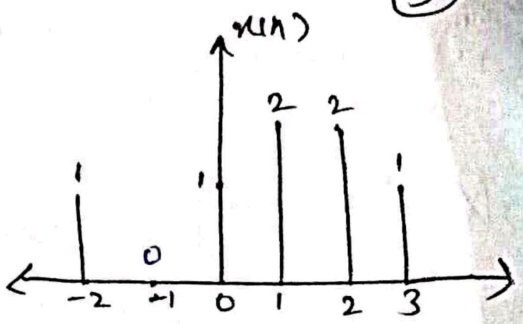
If $\Delta t = t_1 - t_0 = t_2 - t_1 = t_3 - t_2 = t_n - t_{n-1}$

then if say that the discrete time signal is uniformly sampled.

Example A descrete time Signal.

$$x(n) = \{1, 0, \underset{\uparrow}{1}, 2, 2, 1\}$$

$x(n)$ when $n=0$



Addition of Continuous Time Signal

$x_3(t) = x_1(t) + x_2(t)$

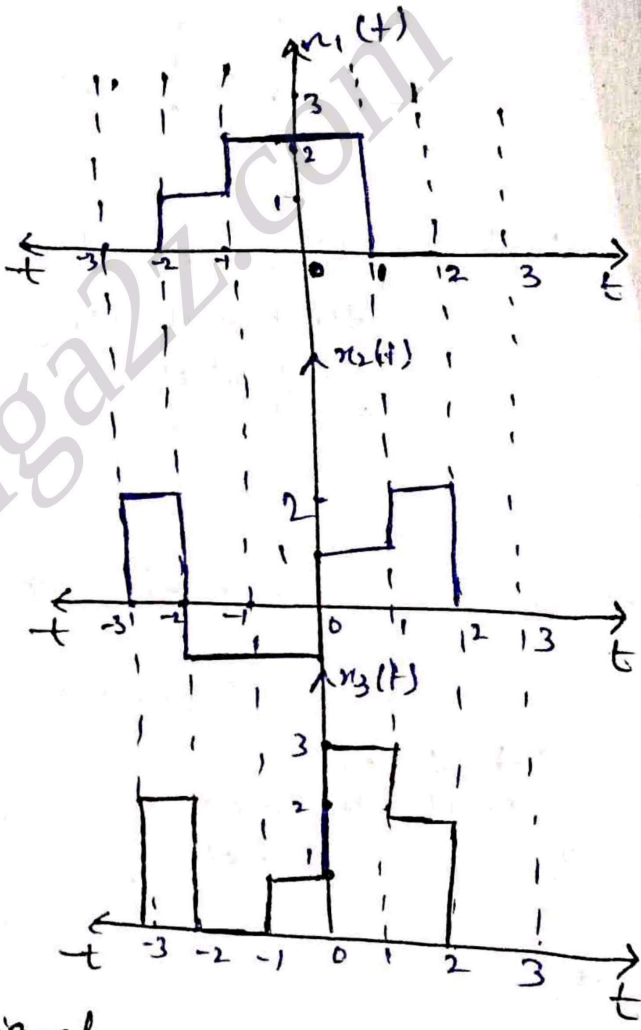
$1 < t \leq 2$, $t = 2$
$x_1(t) = 0$
$x_2(t) = 2$
$\therefore x_3(t) = 0+2 = 2$

$0 < t \leq 1$, $t = 1$
$x_1(t) = 2$
$x_2(t) = 1$
$x_3(t) = 2+1 = 3$

$-3 < t \leq -2$
$x_1(t) = 0$
$x_2(t) = 2$
$x_3(t) = 2+0 = 2$

$-1 < t \leq 0$
$x_1(t) = 2$
$x_2(t) = -1$
$\therefore x_3(t) = 2+(-1) = 1$

$-2 < t \leq -1$
$x_1(t) = +1$
$x_2(t) = -1$
$\therefore x_3(t) = 0$



Time scaling of continuous Time Signal

Scaling
- Time Scaling
- Amplitude Scaling.

Time Scaling :— The compression or expansion of a signal in time

In time scaling we multiply the time with number which is not equal to zero.

📄 Preview Ends Here

🔒 Download Full Notes (Password Protected)

This PDF is only a **preview**.
To download the **complete Notes PDF**, please follow the steps below:

👉 How to Get Full Notes PDF

1. Visit the Notes Page on our website
2. Fill the Notes Access Form
3. Enter correct details only
4. Submit the form

📩 *You will receive the PDF password instantly on your email*

⚠️ Important Notice

- This system is only for serious students
- Please fill the form with correct information
- Wrong or fake details may block password access

🎓 For Serious Students Only

This content is shared strictly for educational purposes.

🌐 Visit Again

www.engineeringa2z.com