Signal Analysis & Communication

ECE 355 H1 F

Ch 1.4 :
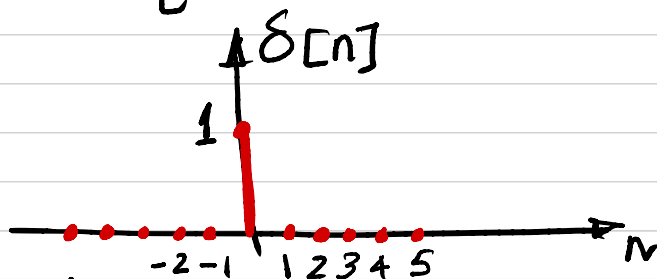
Unit Step & Unit Impulse Function

The Unit Impulse & Unit Step Functions (ch. 1-4)

- Basic building blocks for construction & representation of other signals.

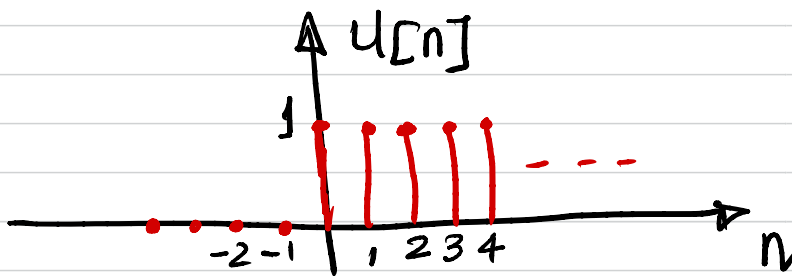DT Unit Impulse & Unit Step Sig./Seq.:

a) Unit Impulse (OR Unit Sample)

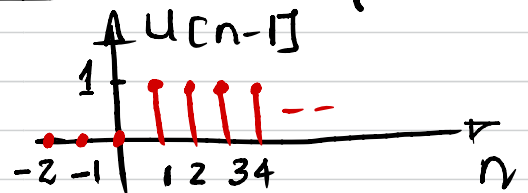$$\delta[n] = \begin{cases} 0 & n \neq 0 \\ 1 & n = 0 \end{cases}$$

b) Unit Step

$$u[n] = \begin{cases} 0 & n < 0 \\ 1 & n \geq 0 \end{cases}$$

Relationship b/w DT Unit Impulse & Unit Step

$$\delta[n] = u[n] - u[n-1]$$

Conversely,

$$u[n] = \sum_{m=-\infty}^{n} \delta[m]$$

$n < 0$

interval of summation

$n \geq 0$

interval of summation