Hany Ismail
+965-51178112

EE 201

For KCST

EE101 - EE112 - EE211 - EE201 - EE212 - EE312 - EE341 - EE342 - EE351 - EE352 - EE365 - EE410 - EE441 - EE442 - EE443 - EE451

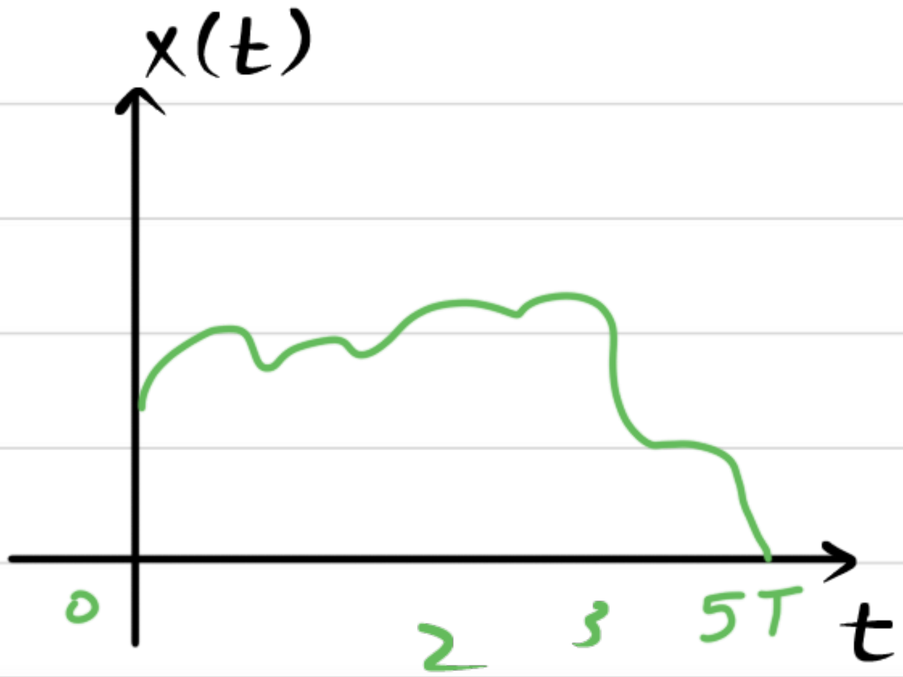
فالكم A

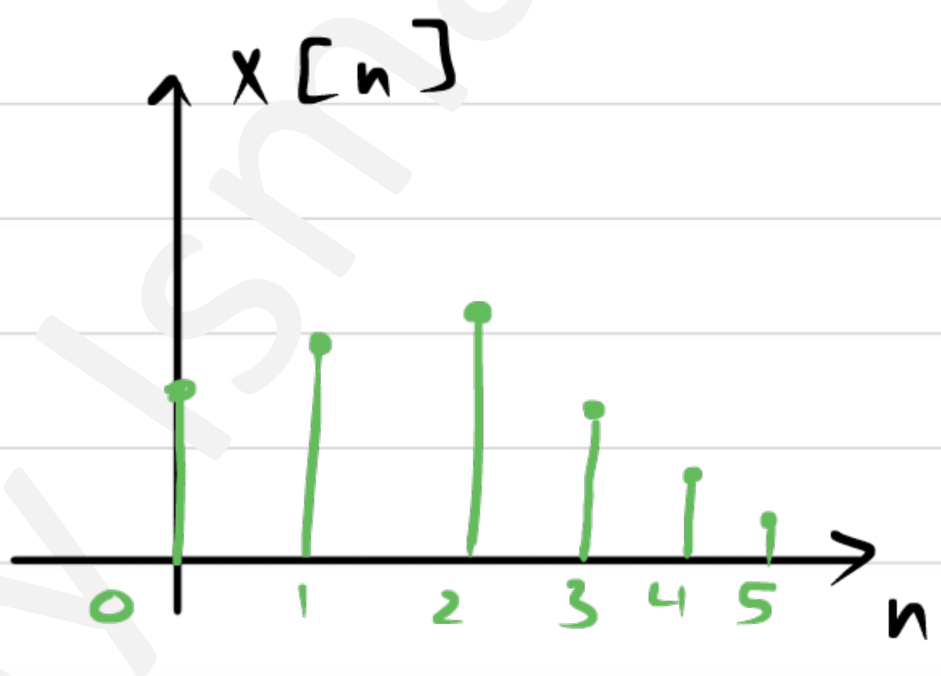
Eng. Hany Ismail --- 51178112

EE 201 _ Signals and systems

✯ Classification of signals :

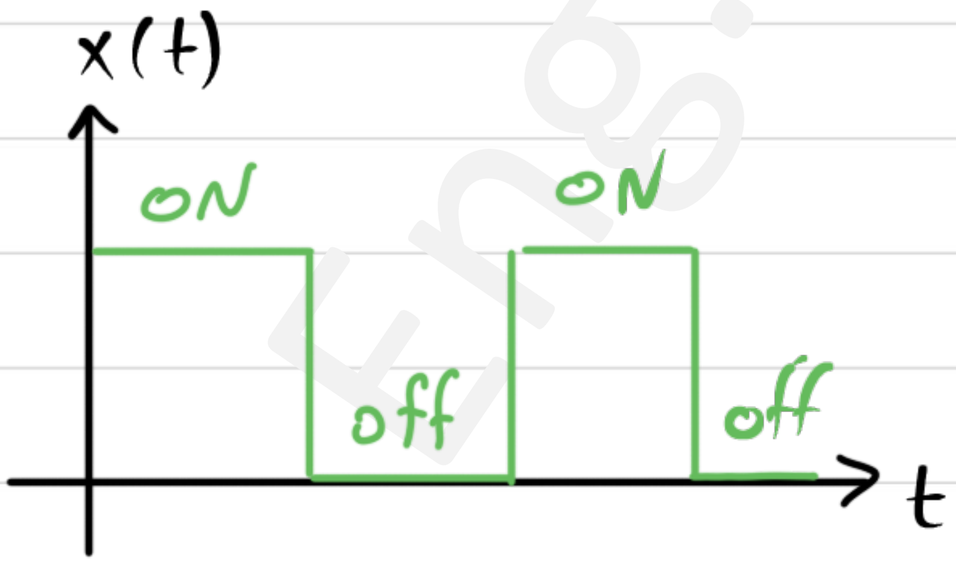
① Continous ② Discrete

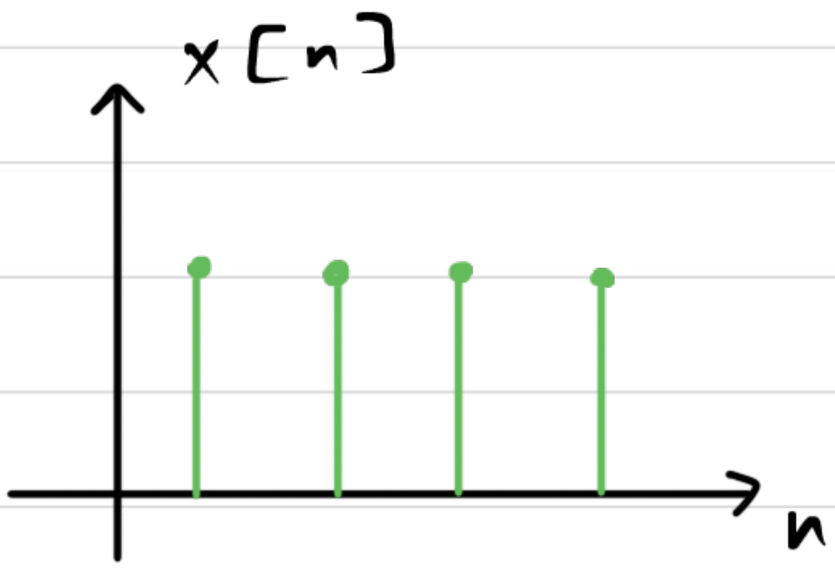




* Analog and digital :

analog



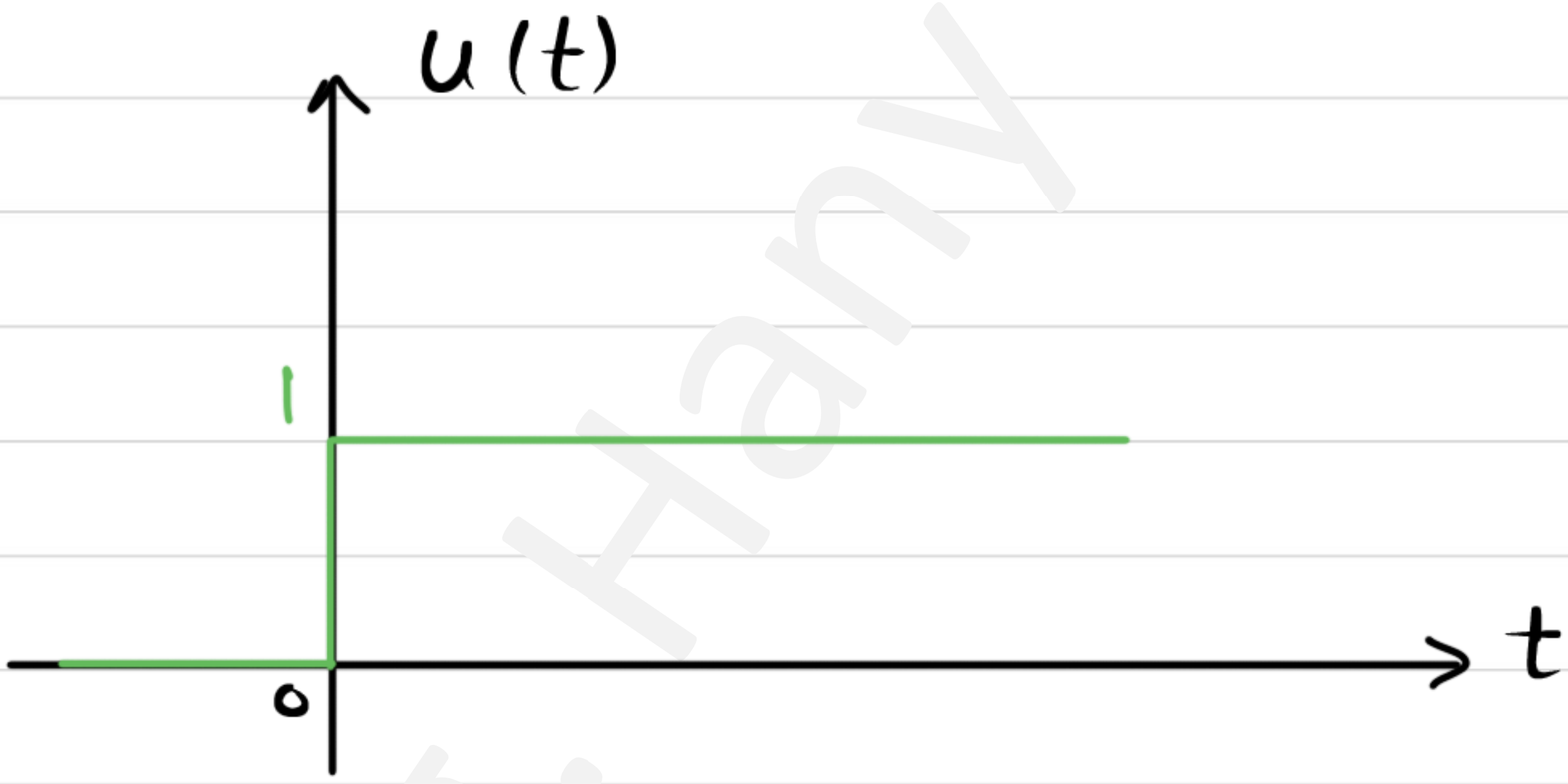


Eng. Hany Ismail --- 51178112

* Unit step function :

$$U(t) = u(t)$$

$$U(t) = \begin{cases} 0 & t < 0 \quad \text{القيم السالبة} \\ 1 & t > 0 \quad \text{القيم الموجبة} \end{cases}$$



Eng. Hany Ismail

متكرر

<< Periodic and aperiodic signals:

a periodic = not periodic

the signal is periodic if

$$x(t) = x(t + T_o)$$

حيث

$\cos(\omega t + \theta)$
$\omega = 2\pi f$

Examples:

- **Is the given signal periodic?**
- **If yes, what is the fundamental period?**

Using an equation

$$x(t) = 3\cos(2000\,\pi\, t - \frac{\pi}{6})$$

Note :

Sinusoidal = Sin or cos ⟶ Periodic

* Sol:

yes, CT Sinusoidals are periodic

$\omega = 2000\pi \longrightarrow f = \frac{\omega}{2\pi} = \frac{2000\pi}{2\pi} = 1000$

$\therefore T = \frac{1}{f} = \frac{1}{1000} = 1 \times 10^{-3}\,S = 1\,ms$

Eng. Hany Ismail

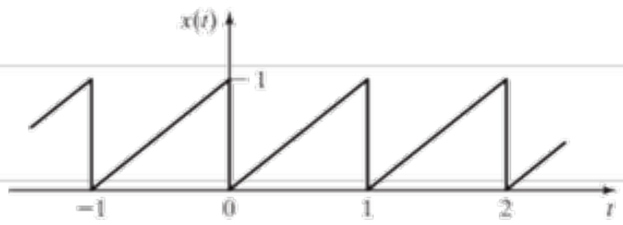
Eng. Hany Ismail --- 51178112

متكرر

Examples:

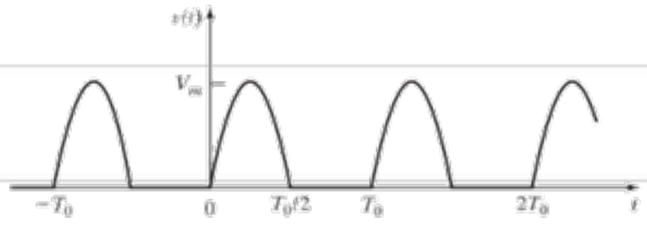
- Are the given signals periodic?
- If yes, what are the fundamental periods?

Using a graph



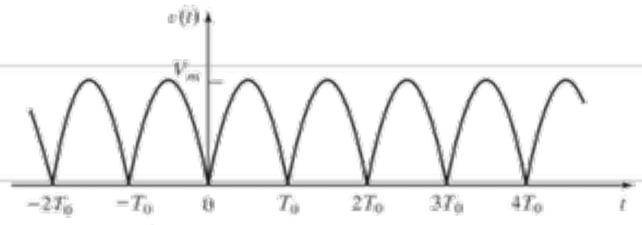
Periodic

$T = 1\ s$



Periodic

$T = T_0\ s$



Periodic

$T = T_0\ s$

Examples: Is $x(t) = e^{sin(t)}$ periodic?

$x(t+T) = e^{\sin(t+T)}$

for $T = 2\pi$

$\therefore x(t+T) = e^{\sin(t)}$

$\therefore x(t) = x(t+T)$

$\therefore$ periodic

Is $x(t) = t\, e^{sin(t)}$ periodic?

$x(t+T) = (t+T)\, e^{\sin(t+T)}$

for $T = 2\pi$

$\therefore x(t+T) = (t+T)\, e^{\sin(t)}$

$\therefore x(t) \neq x(t+T)$

$\therefore$ aperiodic