

ELEC 3004 63-358 6/3/2014 THU 15:00

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Signals :

→ Classification

↳ Continuous-time / discrete-time

↳ Analog / digital

↳ Periodic / A-P

↳ Energy / Power

↳ Deterministic / Random

→ operations

↳ Time Shift

↳ Time scaling

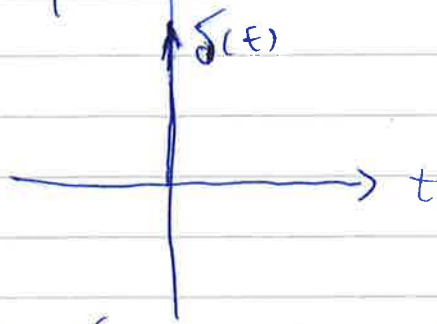
↳ Time inversion

→ models

↳ Unit Step  $u(t)$



Unit impulse  $\delta(t)$

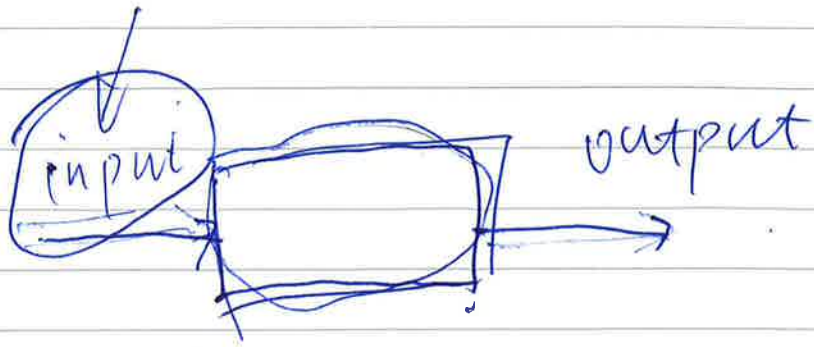


$$\delta(t) = 0 \quad t \neq 0$$

$$\int_{-\infty}^{+\infty} \delta(t) dt = 1$$

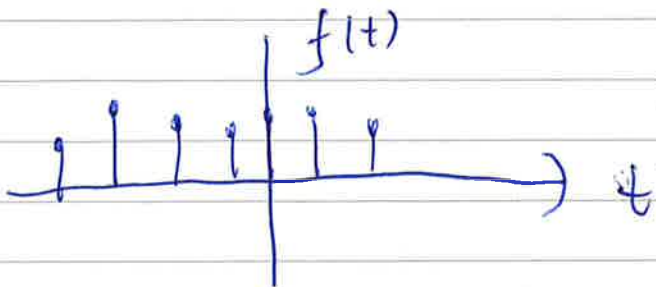
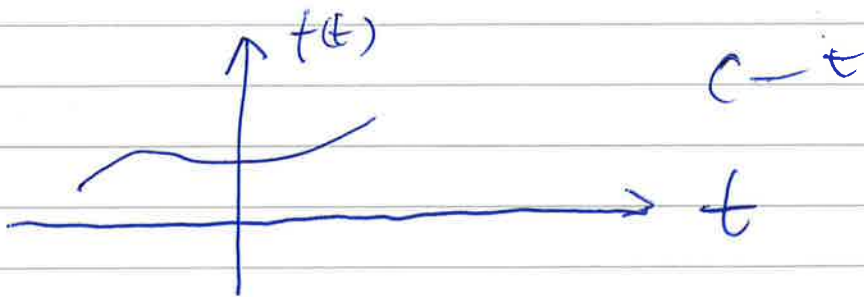
$$\rightarrow \phi(t) \delta(t) = \phi(0) \delta(t)$$

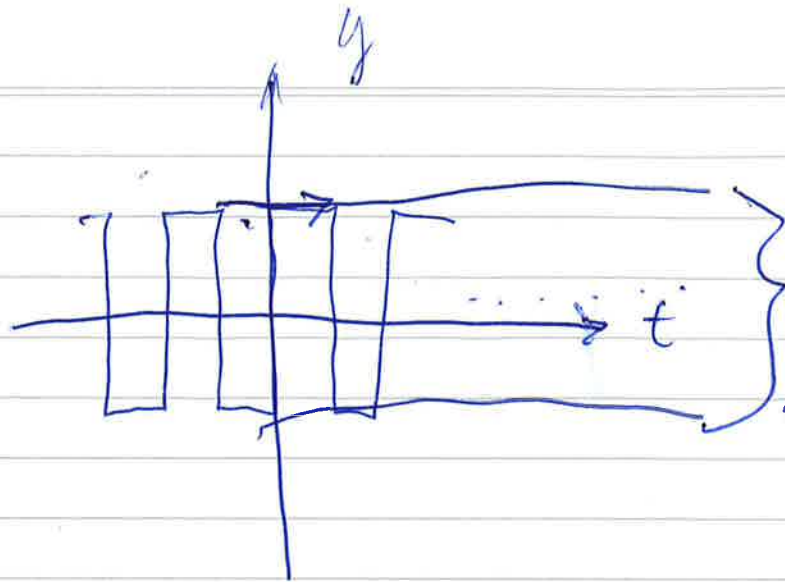
$$\phi(t) \delta(t - \tau) = \phi(\tau) \delta(t - \tau)$$



## Signals.

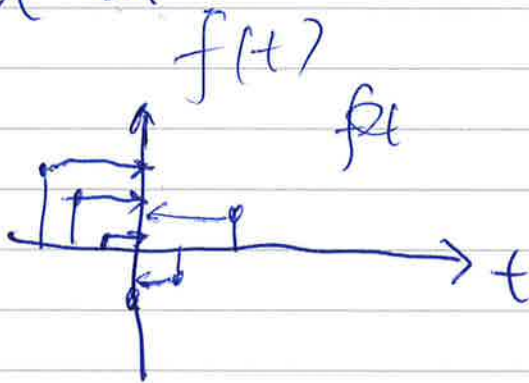
- continuous-time signal
- discrete-time - - -





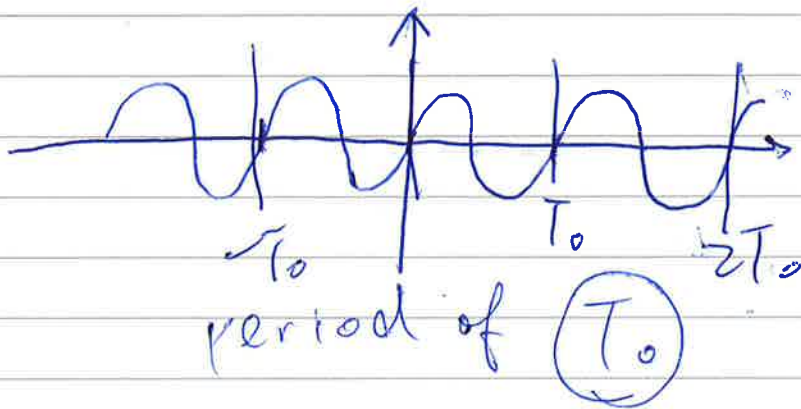
⇒ Analog signals

⇒ Digital is



↳ periodical

$$f(t) = f(t + T_0)$$



↳ aper ~ ~

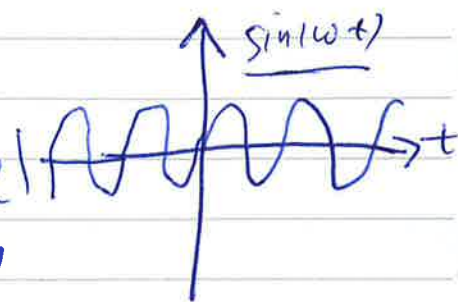
↳ Energy & Power

$f_n \rightarrow$  finite energy

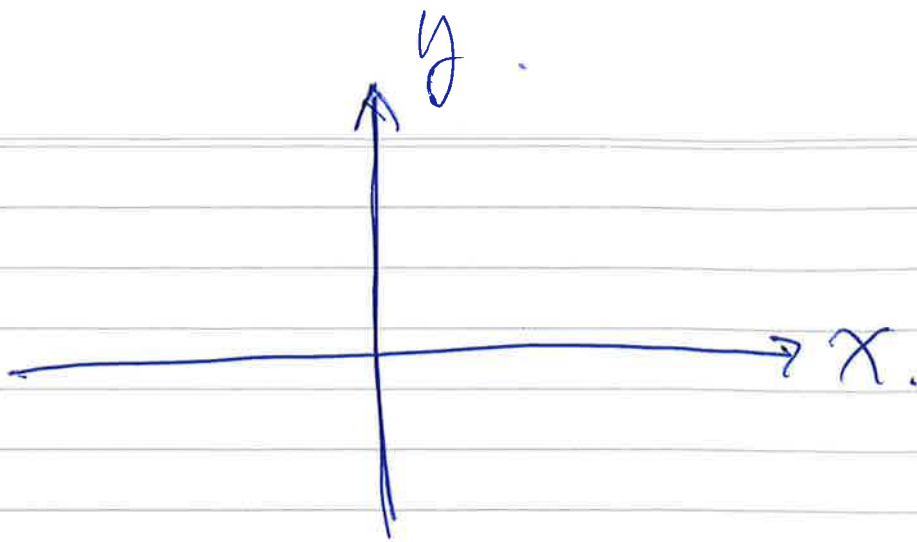
A signal can NOT be both  
energy signal and power signal

↳ Deterministic signal

Random signal



$f(t) = \sin(\omega t)$



Signal Operations:

(time shift)

