

# SYSTEM DESCRIPTION

## 1. Linearity

IF

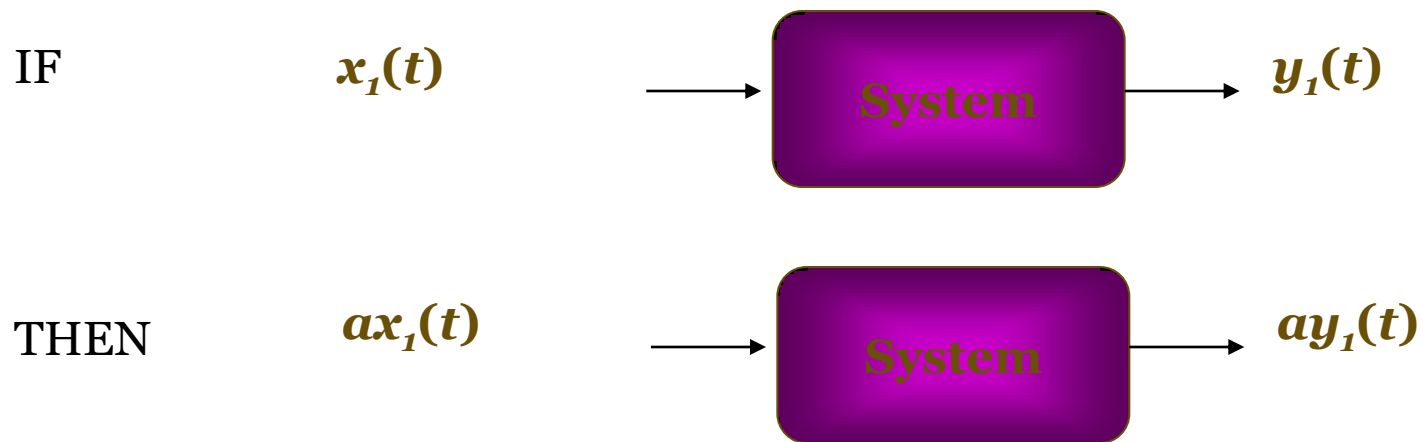


THEN



# *SYSTEM DESCRIPTION*

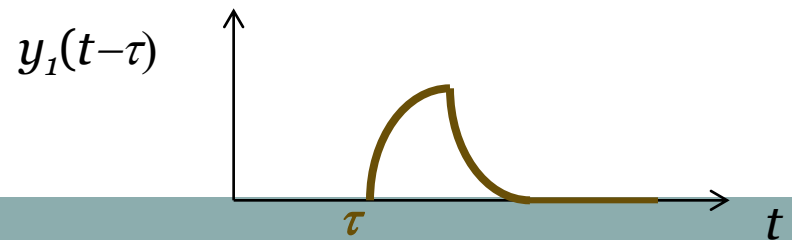
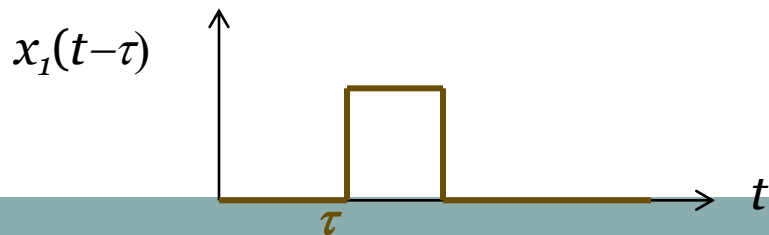
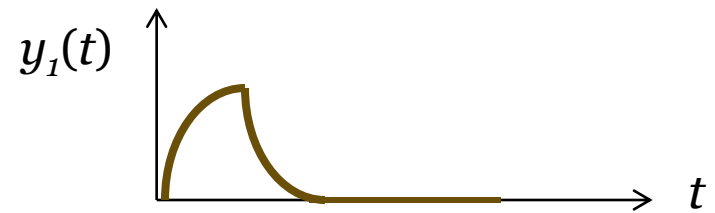
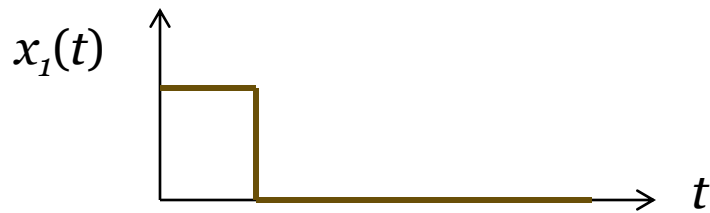
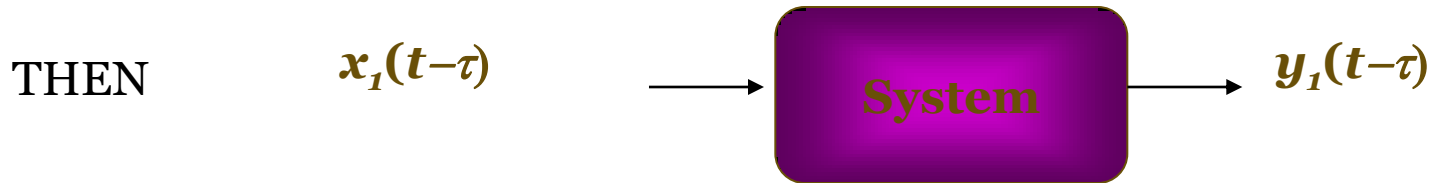
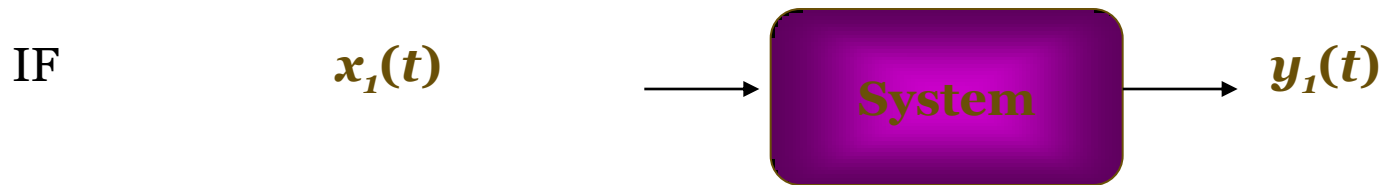
## 2. Homogeneity



Where  $a$  is a constant

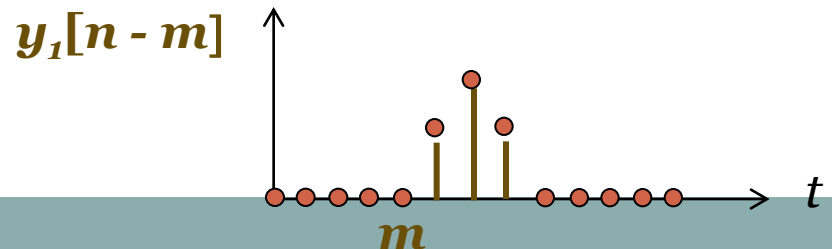
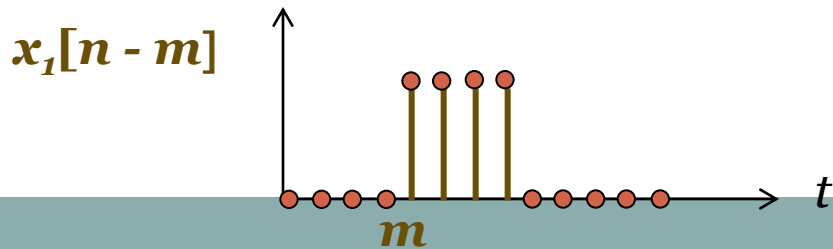
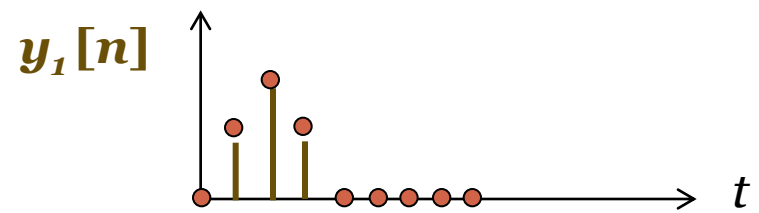
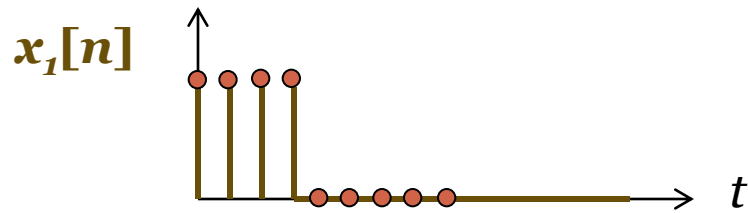
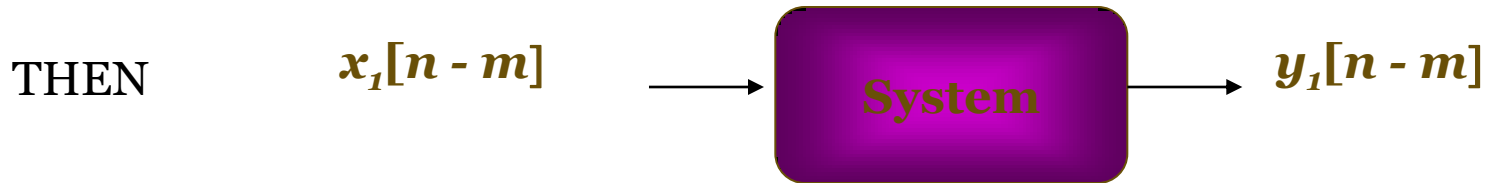
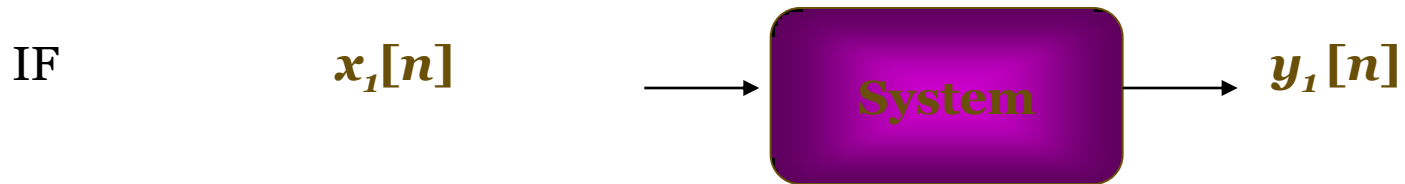
# SYSTEM DESCRIPTION

## 3. Time-invariance: System does not change with time



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## 3. Time-invariance: Discrete signals



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## **4. Stability**

The output of a stable system settles back to the quiescent state (e.g., zero) when the input is removed

The output of an unstable system continues, often with exponential growth, for an indefinite period when the input is removed

## **5. Causality**

**Response (output) cannot occur before input is applied, ie.,**

$$y(t) = 0 \quad \text{for } t < 0$$