

ADC & DAC

Person → mechanical waveform → microphone (Diaphragm) → voltage waveforms



Analog signal waveform

Digital signal



Transmitted
Analog voltage waveform

Speakers

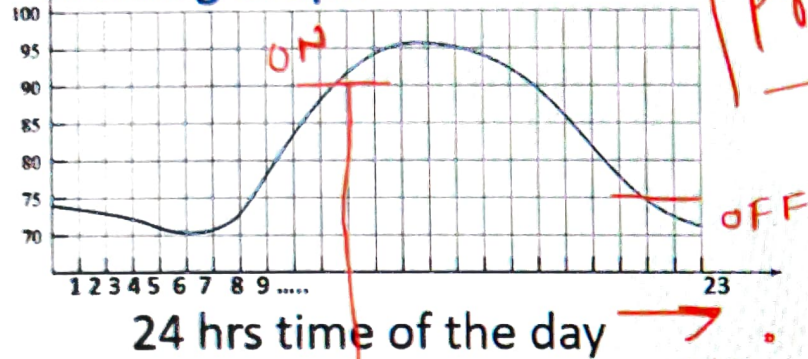
Sound wave



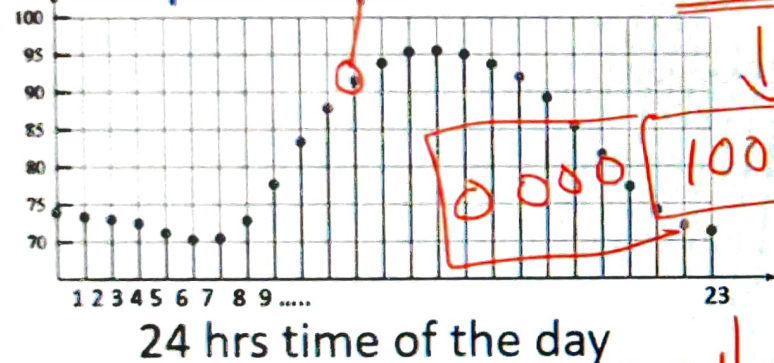
Analog to digital data conversion

Temperature in °F

Analog Graph



Sampled Graph



Processing

- The dot is the sampled data
- The value of each dot is represented in digital format in a sequence of bits
- For example the first dot with magnitude 74 in digital format is 1001010

> 30°C
turn on AC

< 25°C
turn off AC

90

0000 1001 0000

Compare

25

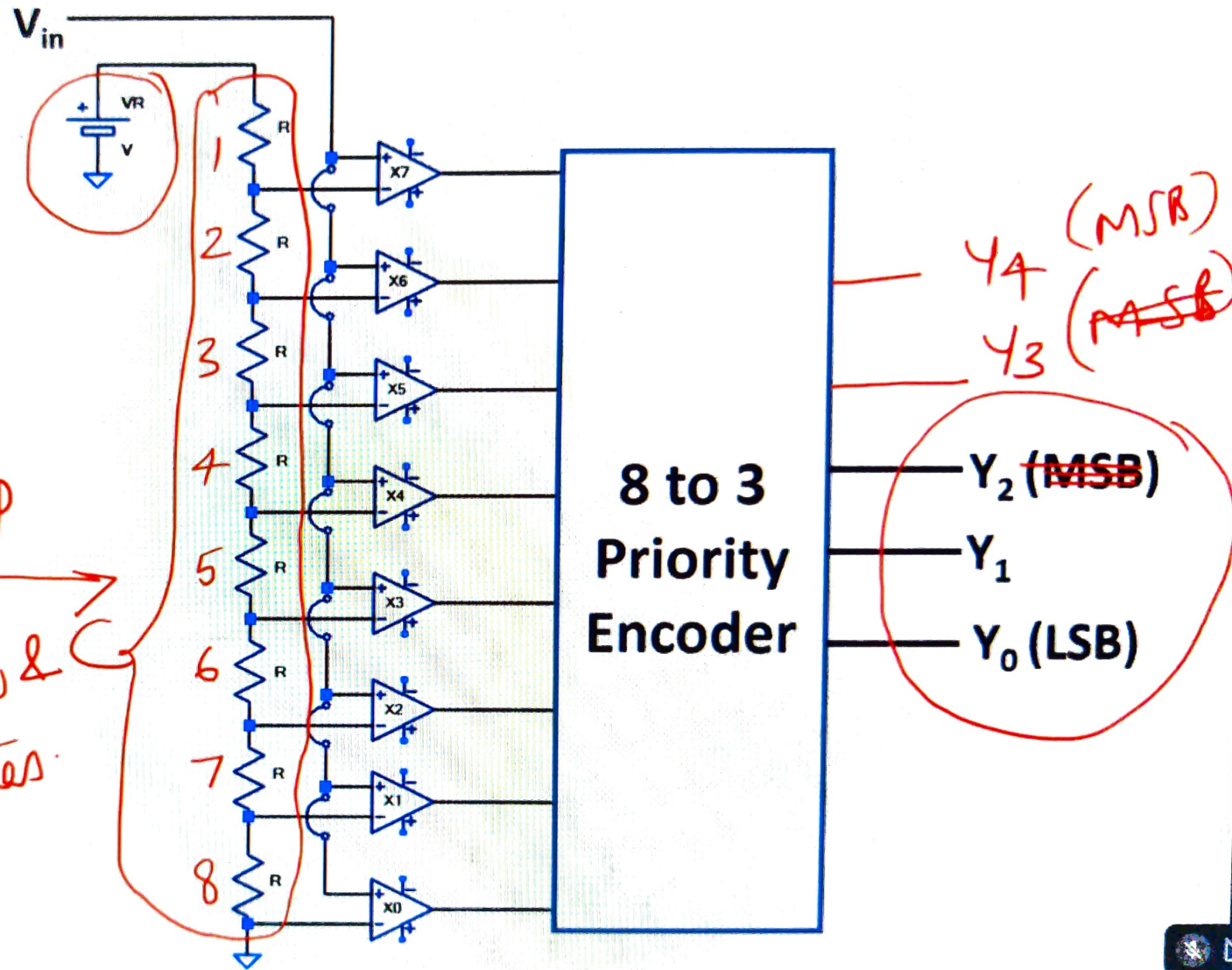
Temp

speed
physical
parameters

0000 1001 0000

3-bit Analog to Digital converter

Resistive divider network
Total comparators = 2^3
8 to 3 Priority Encoder



3-bit Analog to Digital converter

Resistive divider network

Total comparators = 2^3

8 to 3 Priority Encoder

$$V_1 = \frac{V_R}{8} = 1$$

$$V_2 = \frac{V_R}{4} = 2$$

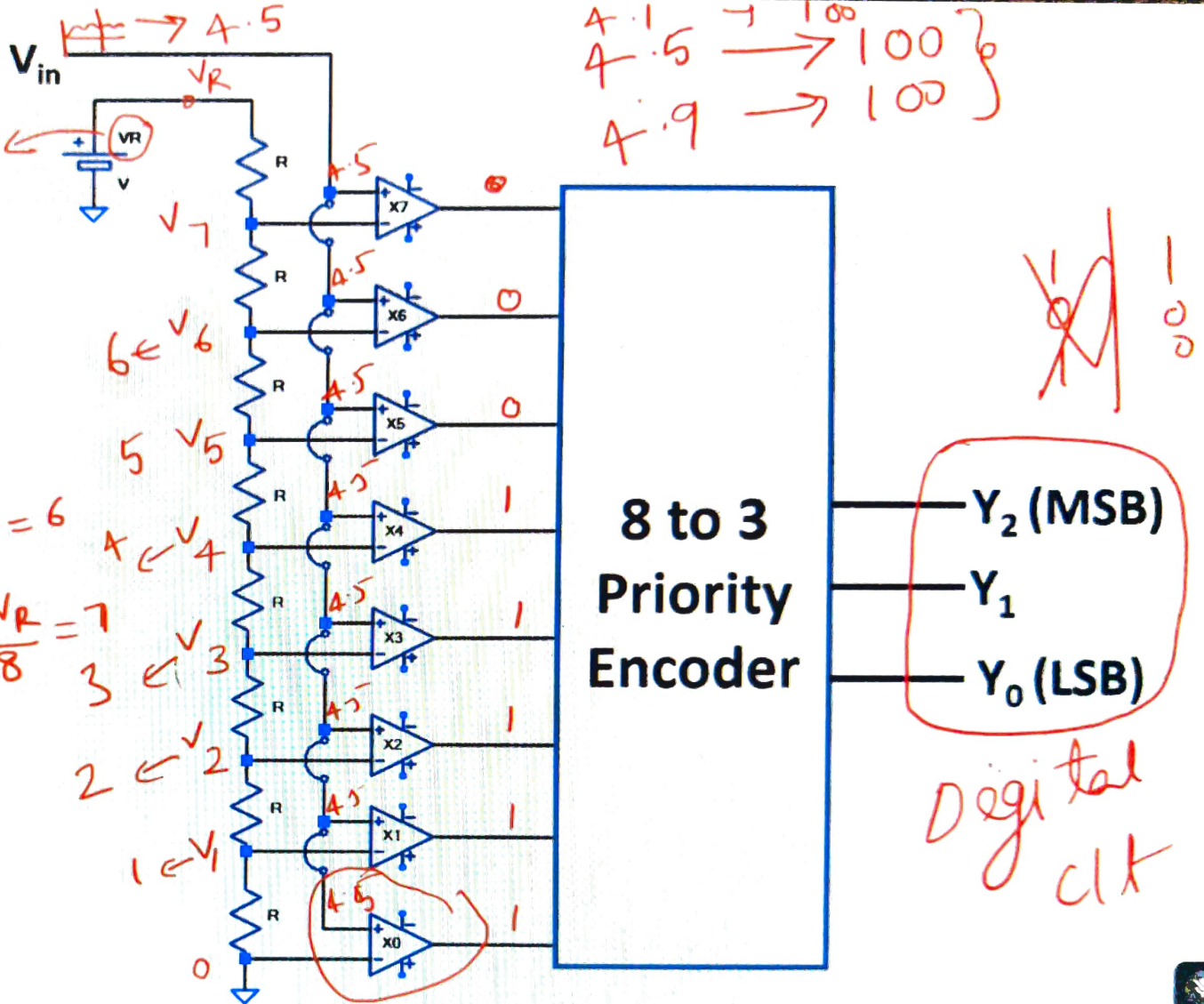
$$V_3 = \frac{3V_R}{8} = 3$$

$$V_4 = \frac{V_R}{2} = 4$$

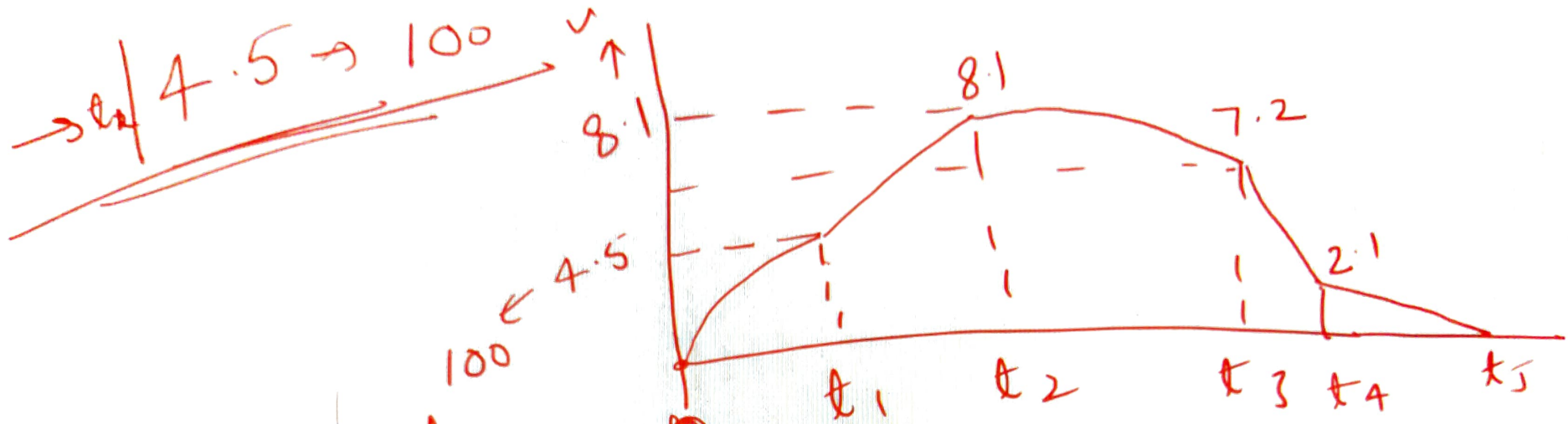
$$V_5 = \frac{5V_R}{8} = 5$$

$$V_6 = \frac{3V_R}{4} = 6$$

$$V_7 = \frac{7V_R}{8} = 7$$



[illegible]



time	Analys	lights
0	50	000
t_1	4.5	100
t_2	8.1	111
t_3	7.2	110
t_4	2.1	001
t_5	0	000