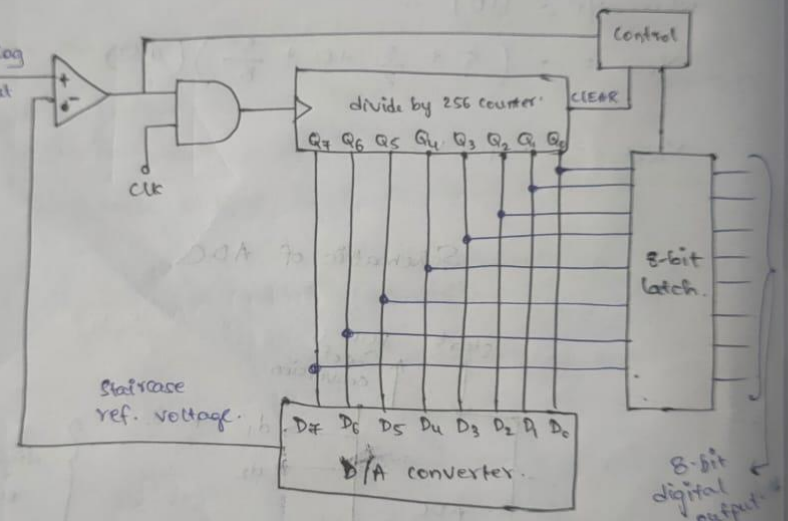
A) Direct type ADC → Compare a given analog signal with the internally generated equivalent signal.

B) Integrating type ADC

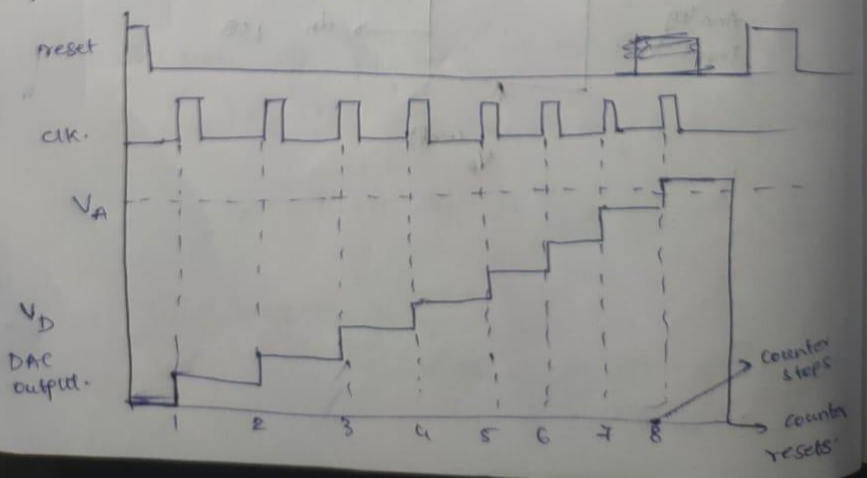
↓

Performs conversion in an indirect manner by first changing the analog input signal to a linear function of time or freq & then to a digital code.

A1) Counter type ADC



28/5/22



A2) S

Analog input

B) Dual

Analog input

End

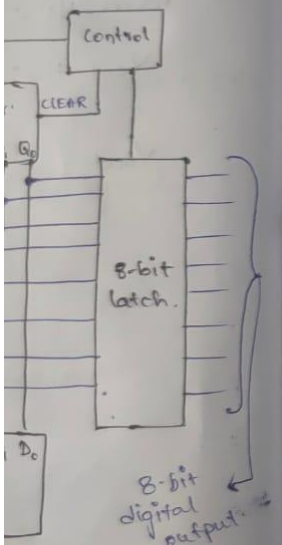
Range

nalog signal with the
ted equivalent signal.

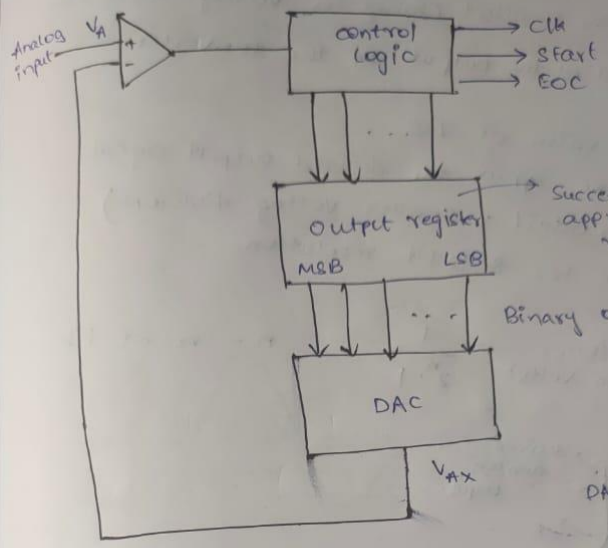
direct manner by

al to a linear

a digital code.



A2) Successive Approximation ADC



$V_A = 11.4\,V$

DAC 0V = 15V

0000 1111

1000 → 8V

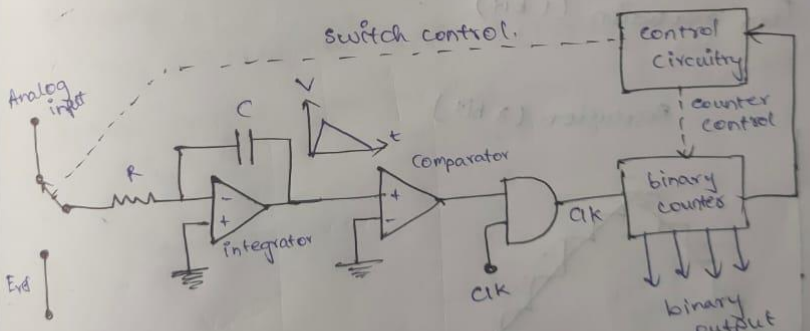
1100 → 12

1000

1010 → 10

1011 → 11

B) Dual Slope ADC



Range:- Low to medium frequencies

Performance Specifications

Resolution: is the smallest change in voltage which may be produced at the output of the converter.

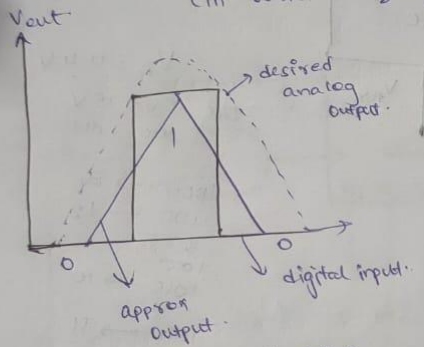
If is the value of LSB.

How closely can we approx the desired output signal (High Res. = finer detail = smaller voltage divisions).

A common DAC has 8-12 bit resolution.

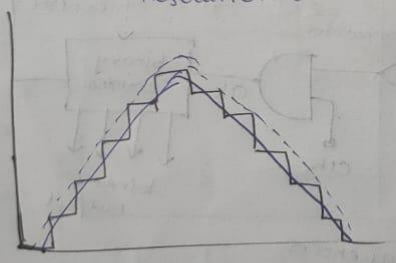
$$\text{Resolution (in volts)} = \frac{1}{2^n - 1}$$

n - no. of bits



Poor resolution (1 bit)

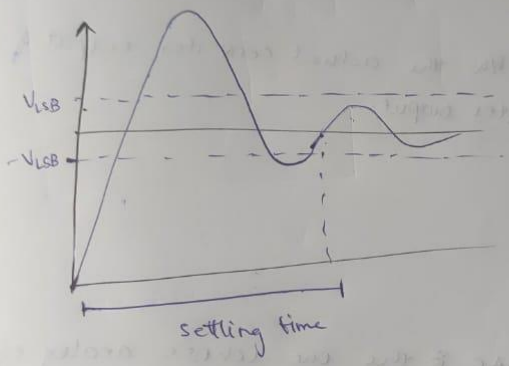
Resolution (3 bit)



Settling time:

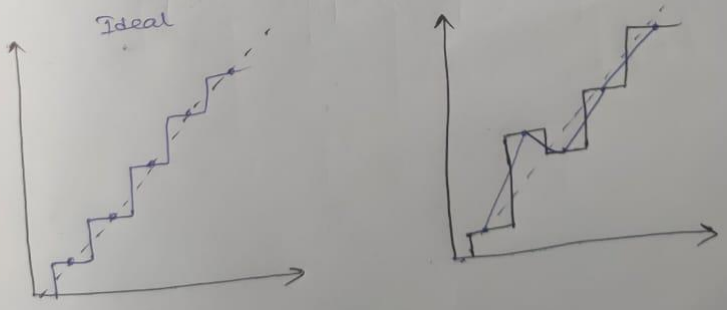
time req for i/p signal voltage to settle to the expected o/p voltage within ± 1/2 LSB.

Any change in input state will not be reflected in the o/p state



Linearity:

The diff b/w the desired analog output and the actual output over the full range of expected values.



Speed :

Accuracy:

The max deviation b/w the actual converter output & the ideal converter output.

Monotonocity.

A monotonic DAC is the one whose analog o/p increases for an increase in digital input.