FLASH OR PARLLEL TYPE ADC

- It is used to convert analog signal into digital signal
- If we convert n-bit data in a single clock pulse and faster operation.

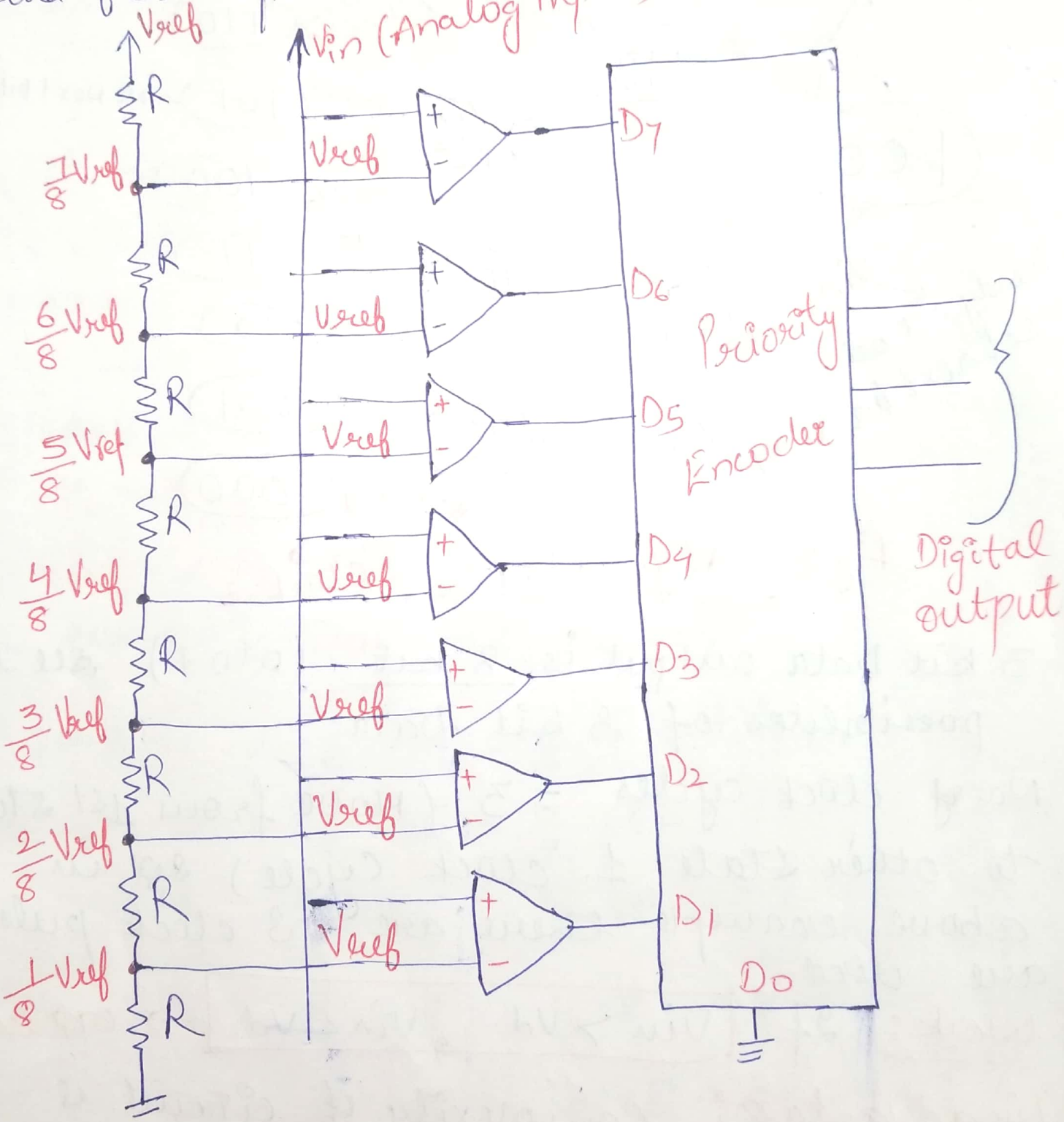

Figure: Parallel type ADC

• Vin = Analog input

Example; Design 3-bit number.

Resistors Required $= 2^n$ resistors $= 2^3 = 8$ Resistor

Comparator Required $= 2^{n-1}$ comparator (OP-AMP)

$= 2^{8-1} = 2^7 = 7$ comp.

Vref = Reference voltage at -ve terminal of OP-AMP

• This ref. vtg is divided into all the terminals. means 2^{n-1} branches

• If Vin > Vref at particular point then your OP-AMP voltage is going to 1 otherwise its zero

Vin > Vref OPAMP O/P = High (1)

Vin < Vref OPAMP O/P = Low (0)

For example; Vref = 8V, Vin = 8V.

1st point D_7 $\frac{7}{8} V_{ref} = \frac{7}{8} \times 8 = 7V$

D_6 $\frac{6}{8} V_{ref} = \frac{6}{8} \times 8 = 6V$

D_5 $\frac{5}{8} V_{ref} = \frac{5}{8} \times 8 = 5V$

D_4 $\frac{4}{8} V_{ref} = \frac{4}{8} \times 8 = 4V$

D_3 $\frac{3}{8} V_{ref} = \frac{3}{8} \times 8 = 3V$

D_2 $\frac{2}{8} V_{ref} = \frac{2}{8} \times 8 = 2V$

Input voltage V_{in} = 8V so each and every point Input voltage is greater than Vref

$V_{in} > V_{ref}$ (each point)

output of OPAMP is always 1.

So you get output of OPAMP = 1

D_1 to D_7 = 1. , D_0 = 0 (Ground)

Priority Encoder: 8 to 3 Encoder means Eight input and 3 output.

Structure of Priority Encoder is Ex-OR gate and some diodes internally connected according to that value. it convert into 8 bit to 3 bit data; so finally we get our digital output data here.

Q. How many comparator you are required in flash type ADC? $2^n - 1$

Q2: How many resistors are you required? 2^n

Q3: How many clock pulse are required? on - Parallel work.

Q4: Fast ADC among all ADC which is

Q5: Disadvantage: complex circuit (Design)