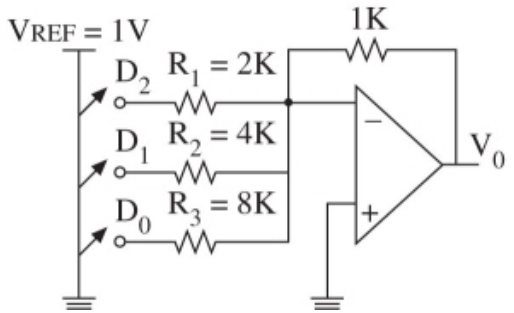
FACULTY OF ENGINEERING & TECHNOLOGY

Dileep Kumar
Assistant Prof. EE Deptt

Example



- If the reference voltage is 1 V, and if all switches are connected, the output current can be calculated as follows:
- Output voltage

$$I_o = I_T = I_1 + I_2 + I_3 = \frac{V_{REF}}{R_1} + \frac{V_{REF}}{R_2} + \frac{V_{REF}}{R_3} = \frac{V_{REF}}{1k}\left(\frac{1}{2} + \frac{1}{4} + \frac{1}{8}\right) = 0.875\text{mA}$$

$$V_O = -R_f I_T = -(1k)\times(0.875\text{mA}) = -0.875\text{V} = \left|\frac{7}{8}\text{V}\right|$$

D/A Converters as Integrated Circuits

- D/A converters are available commercially as integrated circuits
- Can be classified in three categories.
  - Current output, voltage output, and multiplying type
    - Current output DAC provides the current I_O as output signal
    - Voltage output D/A converts I_O into voltage internally by using an op amp and provides the voltage as output signal
    - In multiplying DAC, the output is product of the input voltage and the reference source V_{REF}.
  - Conceptually, all three types are similar