



ROHINI

COLLEGE OF ENGINEERING & TECHNOLOGY

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(AUTONOMOUS)

R-2R LADDER DAC:

- Wide range of resistors are required in Binary Weighted Resistor type DAC. This can be avoided by using R-2R Ladder type DAC where only two values of resistors are required.
- It is well suited for integrated circuit realization. The typical value of R ranges from 2.5 K Ω to 10K Ω .
- For simplicity, consider a 3-bit DAC as shown in Figure 10.5a, where the switchposition d1 d2 d3 corresponds to the Binary word 100.
- The circuit can be simplified to the equation form of Figure 10.5b and finally to Figure 10.5c.
- Then, voltage at node C can be easily calculated by the set procedure of network analysis as

$$\diamond -V_r ((2/3) R) / (2R + (2/3)R) = -V_r/4$$

- The output voltage

$$\diamond V_o = -2R/R(-V_r/4) = V_r/2 = V_{fs}/2$$

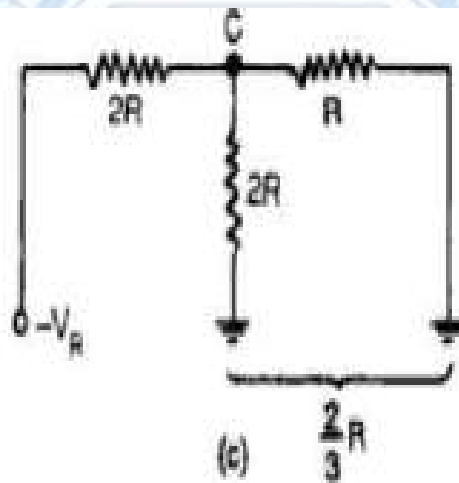
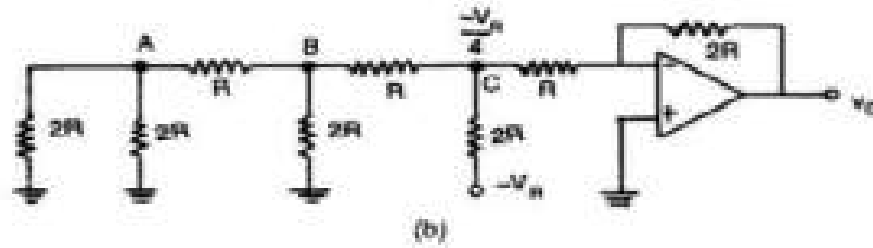
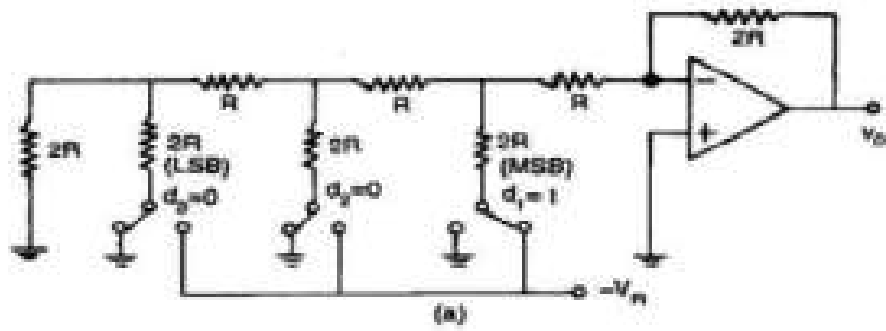


Fig. 10.5 (a) R-2R ladder DAC (b) Equivalent circuit of (a), (c) Equivalent circuit of (b)