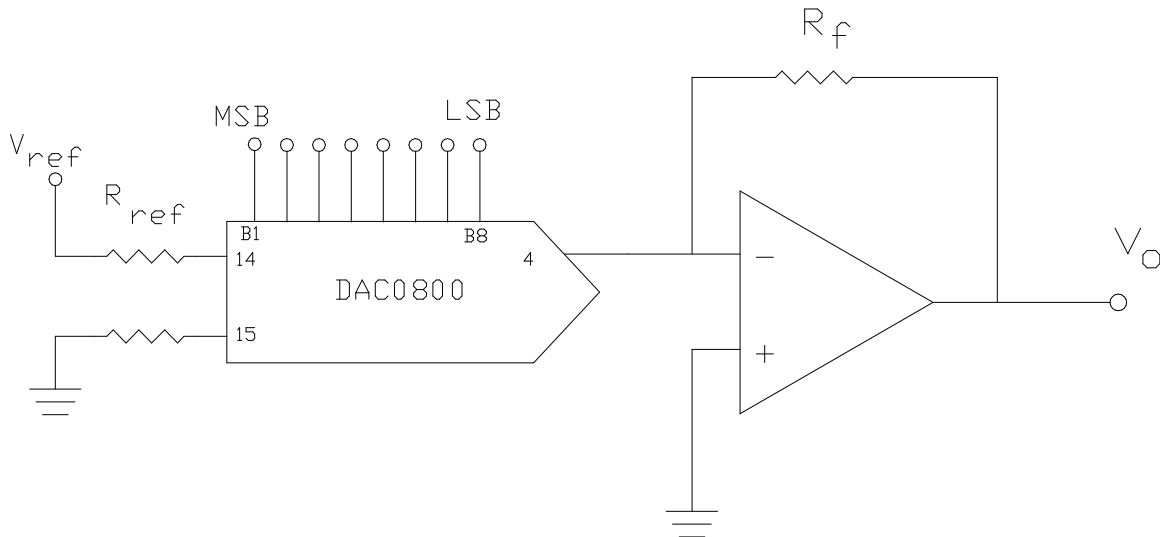


ET 438b
Continuous And Digital Control
Commercial DAC Design

The DAC0800 DAC connection shown has the following values



$V_{ref} = 5 \text{ Vdc}$ $R_f = 10 \text{ k}\Omega$
 $R_{ref} = 5 \text{ k}\Omega$

1.) Determine the output voltage when the digital input has the following values:

- a.) 11111111_2
- b.) 10000000_2
- c.) 0000001_2

- 2.) Convert the binary values of parts 1a, 1b, and 1c into decimal.
- 3.) Calculate the percent resolution of the DAC. What is the value of the LSB?
- 4.) Determine the value of R_f such that the output voltage will be 12 Vdc when the digital input is 11111111_2 .
- 5.) The DAC output is to be used to control a voltage control oscillator (VCO) that has a sensitivity of $.5 \text{ Hz/mV}$. What is the smallest change in frequency that the DAC digital input can produce in the VCO frequency output?