1. Derive the relationship for V_{out} (LSB) and V_{out} (MSB) for n bit DAC.
2. Find the relationship between V_{out} (LSB) and full scale output voltage V_{OFS}.
3. In R-2R ladder voltage mode 4-bit D/A converter, the reference voltage V_{ref} = 5V.
    a. Find the output voltage when input is 0001 and 1010.
    b. Sketch the output when inputs are driven from a 4-bit binary up counter.
4. In R-2R ladder current mode 4-bit D/A converter, V_{ref} =10V and R=10KΩ. Find the total current delivered to the amplifier and the output voltage when binary input is 1010.
5. In 4-bit binary weighted resistor DAC the full scale output is -10V and V_{ref} = 5V. Find the output when input bit is 1010V.
6. Determine the full scale output voltage and resolution for the 4-bit binary weighted resistor DAC having R_f =10KΩ, V_{ref} =5V and R_{max} = 200KΩ.
7. An 8-bit DAC has an output voltage range of 0-25.5V. Define its resolution in two ways.
8. For a 5-bit DAC with the reference voltage V_r being 10V, if there is the fluctuation in the reference voltage of about 10% what will be the deviation in the output for MSB and LSB due to this fluctuation?
9. A DAC has a reference voltage of 5V for 10-bit input and the smallest resistance is R_i =20KΩ. Find the resolution for
    a) Binary weighted b) R-2R ladder.
10. Determine how many bits a DAC must have to provide output increment of 0.04V or less provided for V_{ref}=10V.