Assignment 5 - Oscillators

This Assignment aims at verifying and expanding, with experiments and supporting simulations, your knowledge and understanding of oscillator circuits.

Please document each step with snapshots, pictures, and your observations. Please make visible on WaveForms the date and time fields (top left) and the serial number (bottom right) of your Analog Discovery. Also, please include this page.

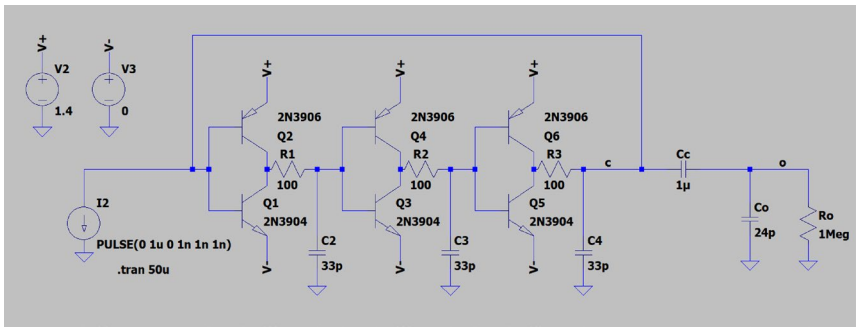

Figure 1

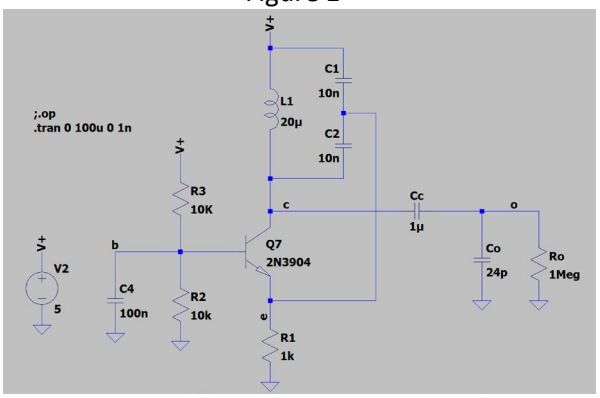

Figure 2

1) Using the simulator, design the configuration in Fig. 1 (**15pts**)

    a) simulate the oscillation and report the frequency and the approximate voltage swing

    b) explain in your own words how the circuit operates

    c) explain why the supply should not exceed 1.4V

2) Build the circuit at (1) and experimentally reproduce all the simulation (**35pts**)

3) Using the simulator, design the configuration in Fig. 2 (**15pts**)

    a) simulate the oscillation and report the frequency and the approximate voltage swing

    b) explain in your own words how the circuit operates

    c) simulate with an ideal inductor and with the actual inductor used in (4); explain in your own words any difference

4) Build the circuit at (3) and experimentally reproduce the simulation (**35pts**)

Note1: Cc, Ro and Co represent the load of the AC-coupled Oscilloscope
Note2: Use a commercial leaded 20µH inductor (e.g. CTX20-2)