EXPERIMENT 2   *Op-amp Circuits*

Objectives: In this experiment, simple op-amp circuit, inverting, summing and difference amplifiers, will be investigated and analyzed.

Materials:

    Breadboard
    DMM (Digital multi-meter)
    Signal Generator(s)
    DC Power Supply
    Oscilloscope
    Resistor(s)
    LM741

Procedure:

1. A (-n inverting) summation amplifier having three inputs is to be designed. Gains of these inputs will be 3,2,1 respectively.

  Input 1: A sinusoidal signal having a peak to peak amplitude of 1 [V], and a frequency of 20 [kHz].

  Input 2: A triangular wave having a peak to peak amplitude of 4 [V], and a frequency of 2 [kHz].

  Input 3: A dc signal having an amplitude of -1 [V].

  a) Determine resistor values (use: 10k, 5.6k, 3.3k, 2.2k)
  b) Determine op-amp feeding voltages with respect to your amplification gains.
  c) Guess and sketch output signal.
  d) Construct the circuit, record input and output voltages.
  e) Show frequency and amplitude contributions of each input component at the output waveform.

2. A difference amplifier is to be constructed. Gain is desired to be two times of the input.

Input: a sinusoidal signal having peak to peak amplitude of 3 [V], and frequency of 10 [kHz].

  a) Determine resistor values (use: 10k, 5.6k, 3.3k, 2.2k)
  b) Determine op-amp feeding voltages with respect to your amplification gains.
  c) Guess and sketch output of common mode signal.
  d) Guess and sketch output of differential mode signal.
  e) Construct the circuit, record input and output voltages.