



EXPERIMENT – 4 OPERATIONAL AMPLIFIERS

PRELIMINARY

- 1) Determine transfer characteristics of the following circuits.
- 2) Plot the input/output waveforms for the following circuits each by using Pspice. Compare the simulation results with the theoretical ones. For each circuit, use below input waveforms respectively.

- 1- *Inverting Amp*: Apply a  $0.5V_{p-p}$  1kHz sinusoidal signal.
- 2- *Non-Inverting Amp*: Apply a  $0.5V_{p-p}$  1kHz sinusoidal signal
- 3- *Summing Amp*: Apply a  $1V_{p-p}$  1kHz sinusoidal signal to  $V_{S1}$  and  $0.3V_{p-p}$  1kHz sinusoidal signal to  $V_{S2}$
- 4- *Subtracting Amp*: Apply a  $1V_{p-p}$  1kHz sinusoidal signal to  $V_{S1}$  and  $0.5V_{p-p}$  1kHz sinusoidal signal to  $V_{S2}$
- 5- *Integrator*: Apply a 1kHz  $8V_{p-p}$  square wave as input
- 6- *Differentiator*: Apply a 1kHz  $8V_{p-p}$  triangular wave as input

Note: Use LM741 in opamp.olb for spice simulation. Take  $V_+ = 10V$  and  $V_- = -10V$ .

