

# Electronic Circuits Laboratory

## EE462G

### Lab #1

Measuring Capacitance,  
Oscilloscopes, Function Generators,  
and Digital Multimeters

# Instrumentation

## Oscilloscope TDS 3012B

- Display real-time periodic waveforms
  - Typical Frequency limits 7Hz to 20MHz
  - Amplitude accuracies are about .25% of reading (offset) + .1\*(V/div) + 1.5 mV
- 2 channels (1 and 2) with probes grounded to earth ground.
- Probe (P3010B) with input resistance  $10\text{M}\Omega$  in parallel with 13.3 pF and bandwidth of 100MHz.
- GPIB (General Purpose Instrument Bus) interface module.



Sketch and label schematic of the scope probe.

Explain how it will affect the circuit being measured.

# Instrumentation

## Tektronix's Function Generator AFG310

- Generate single channel sine, square, triangle, ramp, pulse, DC, noise, and arbitrary waveforms:
- Frequency Limits: .01Hz to 16MHz for sine and square wave, and .01Hz to 100kHz for triangle ramp and pulse.
- Amplitude Limits (to 50  $\Omega$  load): 50m to 10V<sub>p-p</sub>
- $\pm$ Accuracy:  $\pm(1\%$  of setting + 5 mV)
- Resolution: 5 mV
- Total Harmonic Distortion @20 kHz: 0.05% for 1 V amplitude
- Pulse Rise/Fall Time:  $\ll 100$  ns.
- Grounded to earth ground with 50 $\Omega$  output impedance

Sketch and label schematic of function generator. Explain how it affects the circuit under test.

