Lab Session 1
(29 Jan - 02 Feb, 2024)

Objectives-I:

(a) Getting Started with Simulink (Matlab): https://www.youtube.com/watch?v=iOmqgewj5XI&list=RDCMUCgdHSFcXvkN6O3NXvif0-pA&index=1

(b) Simulate and analyze a series RLC connected with either DC or AC source. (You may try other simple circuits)

Objectives II:

On Simulink, design a circuit with an AC source (220V, 50 Hz), series RLC branch (two sets) and perform the following activities:

(1) Connect the AC source to a series RL circuit. [choose appropriate value of R and L so that reactance of the inductor is comparable to the resistance]

(2) Connect the current meter in series and measure instantaneous current, and rms value of current. Display the RMS current.

(3) Connect the voltage meter across each: AC source, Resistor and Inductor and measure instantaneous voltage and RMS voltage and display the RMS value.

(4) Connect the power meter across each: AC source, Resistor and Inductor and measure real and reactive power. Connect the display to read the powers.

(5) Run the simulator and analyze the current, voltages and powers displayed. Record and report the same as observations for at least three different choices of the value of R and L.

(6) Now observe the time varying current, voltage and power across the inductor on the three input scope. Correlate the observed waveform on the scope with the values displayed on the corresponding displays. Record and report the same as observation.

(7) Next, keeping the circuit model the same, replace the inductor with a capacitor. Feed the appropriate value of the capacitor and run the simulator.

(8) Analyze the data displayed and waveforms observed on the scope. Record and report the same as observation.

(9) List out the major similarities or differences observed and both series RL and RC circuits connected with an AC source.