Dept of Electronics and Communication Engineering, TKMCE Kollam

Scientific Computing Lab   Aug-Dec 2020

Lab 5: Solution of Ordinary Differential Equations

<u>Experiment:</u>

1. Solve the first order differential equation $\frac{dx}{dt} + 2x = 0$
   with initial condition x(0) =1

2. Solve the second order differential equation $\frac{d^2x}{dt^2} + 2\frac{dx}{dt} + 2x = e^{-t}$

3. Solve for the current transient through an RC network (with RC = 3) that is driven by

          i) 5 V DC

          ii) the signal $5e^{-t}U(t)$

4. Solve the current transient through a series RLC circuit with R = 1Ω, L = 1mH and C = 1 μF that is driven by

          i) 5 V DC

          ii) the signal $5e^{-t}U(t)$

<u>Reports:</u>

<u>Preliminary Lab report:</u>

1. Draw RC and RLC series circuits with voltage source V and apply KVL to these circuits to obtain differential equation that describes response of circuit.

2. Write the algorithm/ flowchart for the experiments listed in preceding section

<u>Final Lab Report:</u>

In addition to the Pre-lab report, document the code, comment each line and clearly report the results of each program (wherever applicable).