

Module 11: Assignment

Modelling Differential Equation

Submitted by:

Bolli Sahithya

Problem Statement

As part of the EV modeling team at a telecommunications company, you're tasked with designing an electronic filter circuit for signal processing in an electric vehicle (EV) communication system. The circuit's dynamics are described by a second-order differential equation governing current flow.

Task to be performed:

Given the differential equation governing the circuit's dynamics in the time domain:

$$L \frac{d^2 i}{dt^2} + R \frac{di}{dt} + \frac{1}{C} i = V_{in}(t)$$

Where:

i is the current flowing through the circuit,

L is the inductance of the circuit,

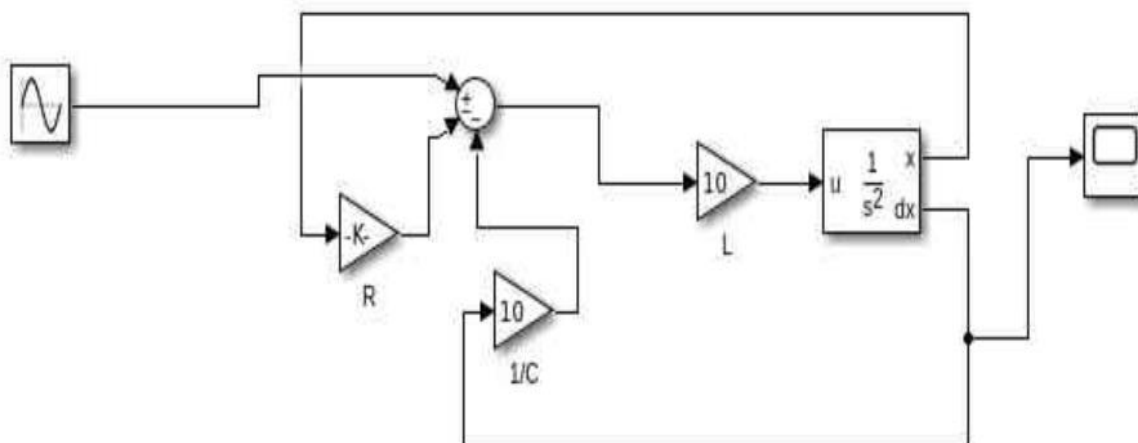
R is the resistance of the circuit,

C is the capacitance of the circuit,

$V_{in}(t)$ is the input voltage to the circuit.

- Develop a Simulink model to represent the electronic filter circuit.
- Derive the transfer function using both time domain and state space representation methods

Simulink:



scope output:

