30-12-2017

MECE 233 Make-up for Midterm

Name:

Surname:

Number:

Q1) For the circuit below C= 2 Farad, L1 = L2 = 1 Henry, R1 = R2 = R3 = 1 Ohm, The circuit is fed by a voltage source VS.

1. Find the state-space representation where the state variables are VC (capacitor voltage), I1 (inductor current over L1) and I2 (inductor current over L2). (40 point)
2. Find the third order differential equation governing VC. (40 point)



Q2) A second order circuit’s differential equation governing the state variable ‘x’ is given by the formula $\ddot{x}+x=sin⁡(t)$ where x(0)=5 and $\dot{x}\left(0\right)=2$. Find x(t)