JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST-1 EXAMINATION-FEB-2023

B.Tech-IV Semester

COURSE CODE (CREDITS): 18B11EC311(3) MAX. MARKS: 15

COURSE NAME: Automatic Control Systems

COURSE INSTRUCTOR: Dr. Salman Raju Talluri MAX. TIME: 1 Hours.

Note: All questions are compulsory. Each question carries three marks. Assume any missing data

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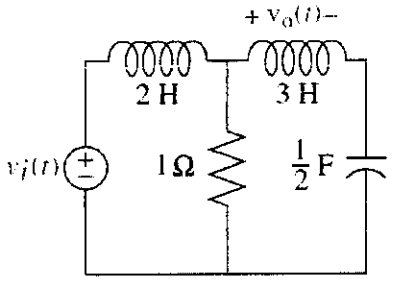
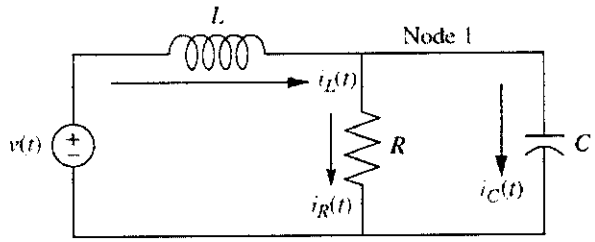
1. Draw the pole zero plot of $G(s) = \frac{s^3+2s^2+6s+7}{s^2+s+5}$. How many finite poles and zeros are present in this transfer function. [CO-1]
2. Find the differential equation corresponding to the transfer function $G(s) = \frac{2s+1}{s^2+6s+5}$. Find the response of the system for an input of $5u(t)$.[CO-1]
3. Find the transfer function $G(s) = \frac{V_o(s)}{V_i(s)}$ for the circuit given below. [CO-2]



4. Obtain the state space representation for the following circuit with $R = 1\,\Omega$, $L = 2\,H$ and $C = 0.5\,F$ with input as $v(t) = 10u(t)$ and output as voltage drop across the resistor.[CO-2]



5. Explain in brief the following. [CO-1 and CO-2]
   a. Linearization of a non-linear function
   b. Laplace transform of a damped sinusoidal signal
   c. Inverse Laplace transform of $F(s) = \frac{1}{(s+3)^3}$