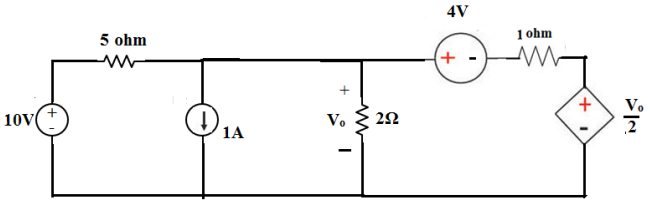
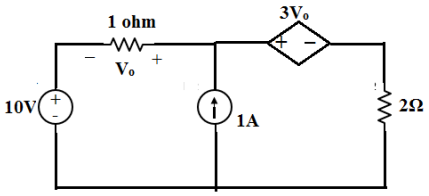
THIRD SEMESTER B.TECH(ELECTRONICS AND INSRUMENTATION ENGG) END SEMESTER DEGREE EXAMINATIONS NOVEMBER – 2019

NETWORK ANALYSIS AND SIGNALS- ICE 2154

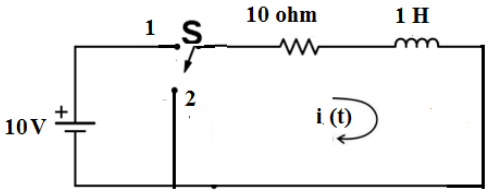
Q1A. Find V_o in the network shown below by using Super position Theorem. (5)



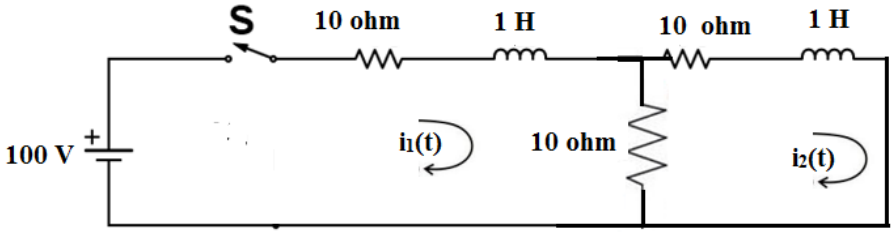
Q1B. Obtain the current in 2 ohm resistor shown in the circuit below by Thevenin's Theorem. (3)



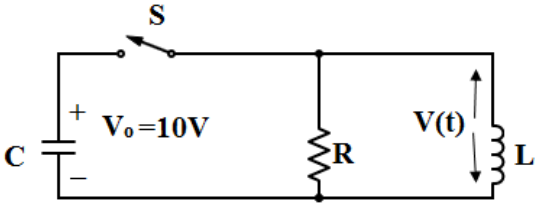
Q1C. In the circuit shown in figure below switch is moved from 1 to 2 at t = 0, before which steady state has been reached. Find the current i (t) at time t = 5mSec. (2)



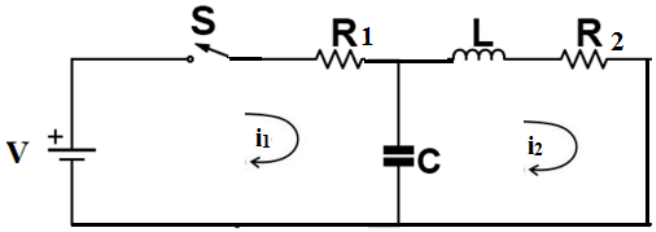
Q2A. Obtain the expression for $i_1(t)$ and $i_2(t)$ in the circuit shown in figure below, with switch closed at t = 0 with zero initial conditions. Use Transform method. (5)



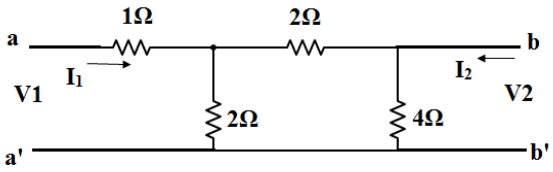
Q2B. In the parallel RLC circuit shown below, R= 0.1 Ohm, L= 0.5 H and C=1 Farad with an initial charge of 10 V. The switch closed at time t = 0. Obtain expression for voltage V(t). (3)



Q2C. For the network shown in figure blow, switch is closed at t = 0. Find $i_1(0)$, $i_2(0)$, $\frac{di_1(0)}{dt}$ and $\frac{di_2(0)}{dt}$. (2)



Q3A. Find the h parameters of the network shown in figure. (5)



Q3B. State with justification whether the system ***y(n)= nx(-n)*** is memory less, causal, linear, time invariant, stable and invertible. (3)

Q3C. Evaluate the energy and power of the signal $\boldsymbol{x(t)=e^{-2t}u(t)}$. (2)

Q4A. Evaluate and plot *y(t).* (5)

(i) $y(t) = x(t)*h(t)$, where $x(t) = \delta(t+1)-\delta(t-1)$ and $h(t) = r(t+1)-2r(t)+r(t-1)$

(ii) $y(t) = u(t)*h(t)$ where $h(t) = u(t+2)-2u(t)+u(t-2)$

Q4B. Find Fourier representation of

$$x(t) = \frac{d}{dt}te^{-2t}\sin(t)u(t)$$

Q4C. Obtain Fourier representation of $x(t) = Cos(\pi t) + Cos(2\pi t) + Sin(5\pi t)$. Plot the spectrum. (2)

Q5A. An LTI system is described by the differential equation

$$\frac{d^2y(t)}{dt^2}+3\frac{dy(t)}{dt}+2y(t)=\frac{dx(t)}{dt}+3x(t)$$

Determine (i) Frequency response of the system (ii) Impulse response of the system (iii) Output of the system for an input *of* $x(t) = e^{-3t}\,u(t)$. (5)

Q5B. Find $x(t)$ if

$$X(j\omega) = \frac{2\sin(\omega)}{\omega(j\omega+1)}$$ (3)

Q5C. Evaluate the following

$$\int_{-\infty}^{\infty}\left(\frac{\sin(\pi t)}{\pi t}\right)^2 dt$$ (2)