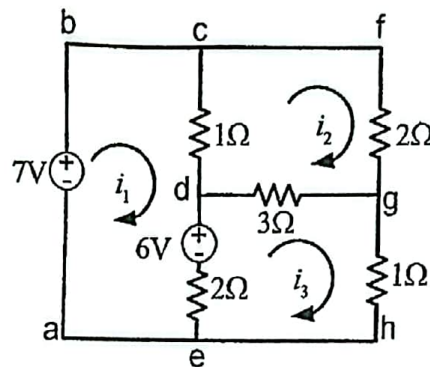


Exam.	Back (New Course)		
Level	BE	Full Marks	60
Programme	BEL	Pass Marks	24
Year / Part	I / II	Time	3 hrs.

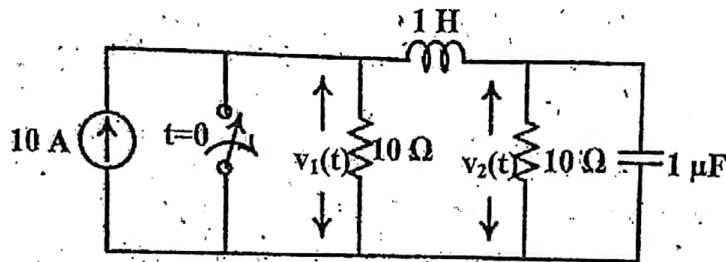
Subject: - Electric Circuit II (ENEE 151)

- ✓ Candidates are required to give their answers in their own words as far as practicable.
- ✓ Attempt All questions.
- ✓ All questions carry equal marks.
- ✓ Assume suitable data if necessary.

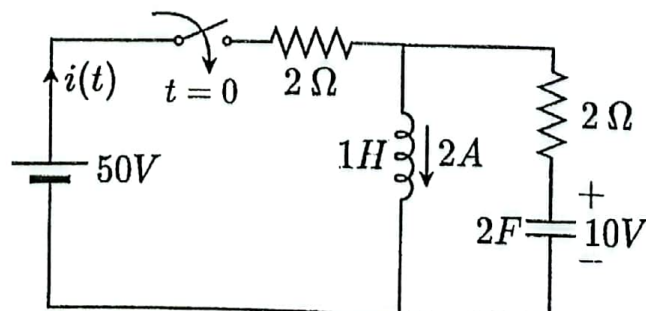
1. Using matrix method, determine the mesh currents.



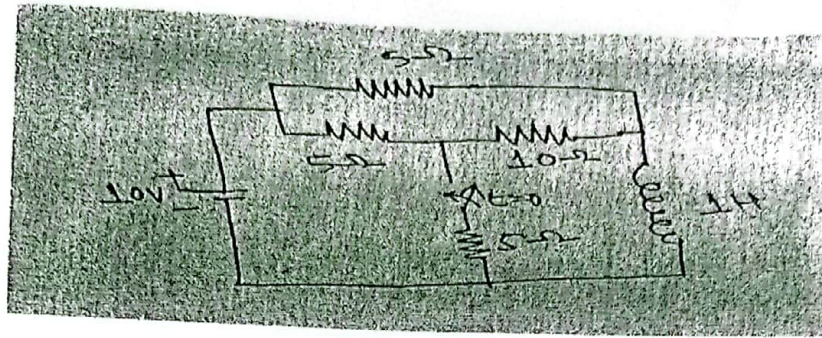
2. In the circuit shown, find V_1 , V_2 , dV_1/dt , dV_2/dt , d^2V_1/dt^2 , d^2V_2/dt^2 at $t = 0^+$.



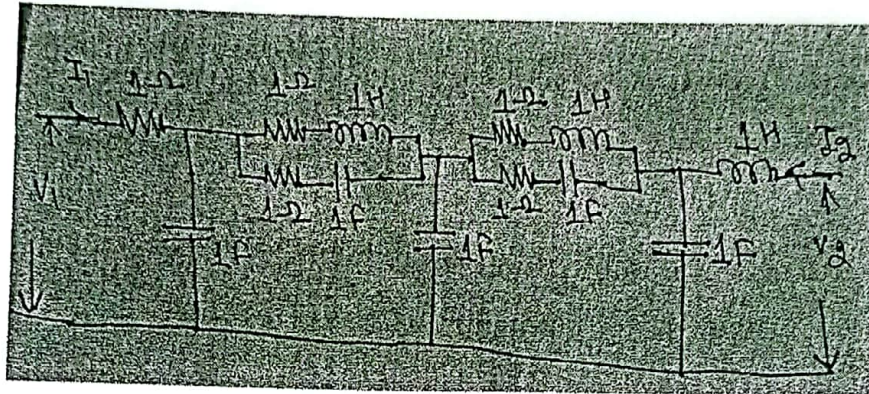
3. An exponential source of $10e^{-5t}$ V is suddenly applied at time $t=0$ to a series RC circuit comprising $R = 4 \Omega$ and $C = 0.05$ F. Obtain the expression for current and voltage of capacitor using classical method.
4. A DC source of 100 V is suddenly applied at time $t = 0$ to a series RLC circuit comprising $R = 4 \Omega$, $L = 1$ H, and $C = 0.2$ F. Obtain the expression for current in the circuit using classical method.
5. Inductor and capacitor were charged before connected to a network shown in the figure below. The switch is closed at $t = 0$. Determine the expression of current $i(t)$ from the source at $t > 0$. (use Laplace Transform)



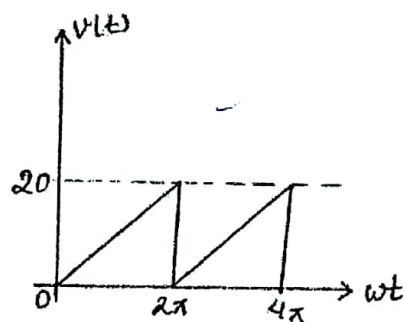
6. In the circuit shown below the switch S is open and the circuit reaches a steady state, at $t = 0$ the S is closed. Find the current in the inductor for $t > 0$ (Using Laplace Transform, Method)



7. Find the voltage ratio transfer function of the two-port network shown below.



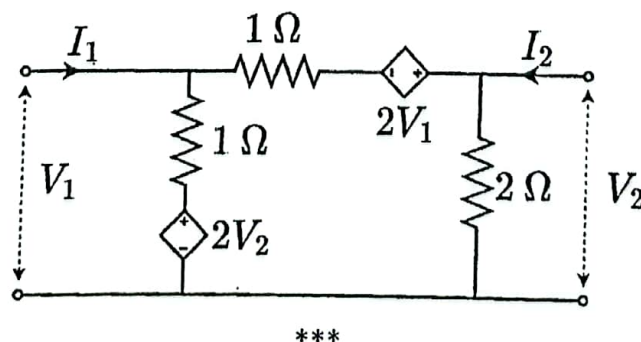
8. Obtain the exponential form of fourier series of the waveform given below and sketch the line spectrum.



9. For the transfer function below, draw the asymptotic bode plot.

$$G(s) = \frac{1000(s + 2)}{s(s^2 + 21s + 20)(s^2 + 2s + 100)}$$

10. The network shown below is a two port network containing dependent voltage source. Obtain T-parameters.

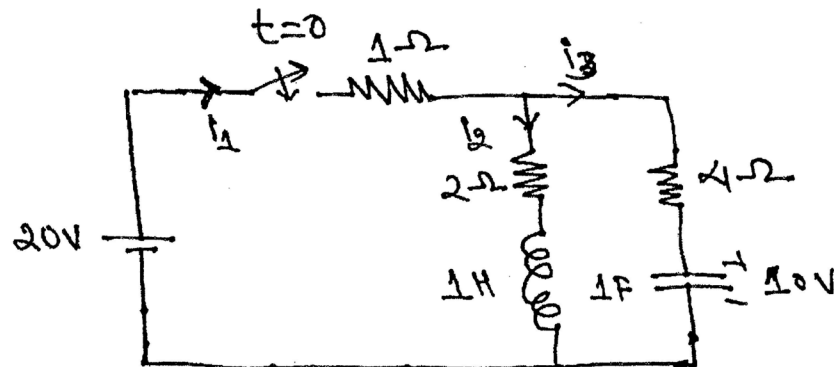


Exam.	Regular (New Course)		
Level	BE	Full Marks	60
Programme	BEL	Pass Marks	24
Year / Part	I / II	Time	3 hrs.

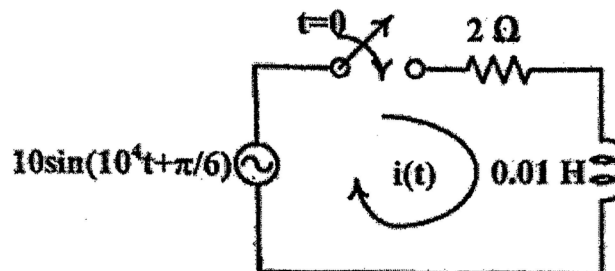
Subject: - Electric Circuit II (ENEE 151)

- ✓ Candidates are required to give their answers in their own words as far as practicable.
- ✓ Attempt All questions.
- ✓ All questions carry equal marks.
- ✓ Assume suitable data if necessary.

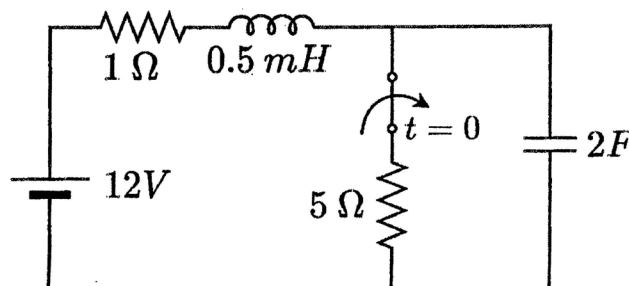
- List the types of sources. What do you mean by dependent sources? Explain its types with relevant circuit.
- Obtain the value of i_1 , i_2 , i_3 at $t = 0^+$ assume that capacitor is initially charged to 10V, also find voltage across and current through all element at $t = 0^+$



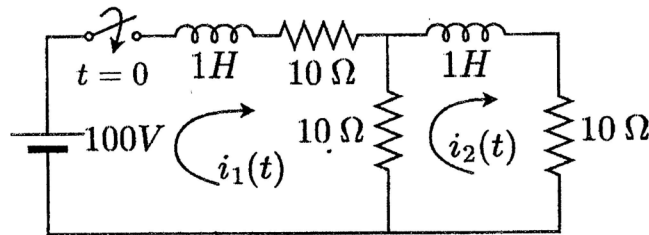
- In the circuit shown, find the expression of current through the inductor using the direct solution method.



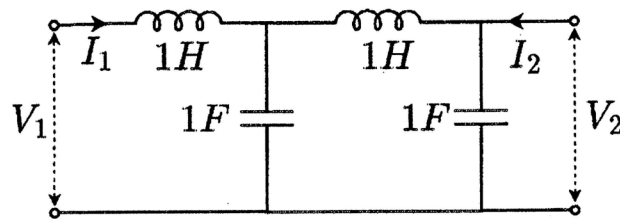
- The switch in the circuit shown in figure is closed for long time. It opens at $t = 0$. Obtain the current through inductor and voltage across capacitor for $t > 0$. (Use classical approach)



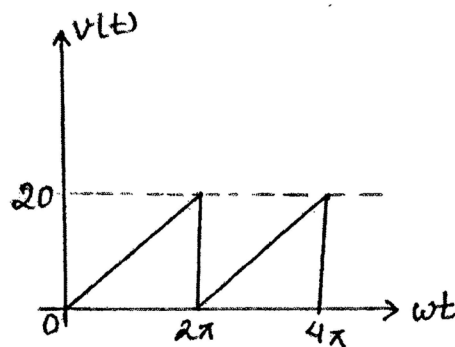
5. In the parallel RLC circuit capacitor has initial voltage of 10V and at the same instant current through inductor is zero. At time $t=0$ suddenly current source of $I(t) = 10e^{-5t}$ A is applied across them having $R=10\ \Omega$, $L=10\text{ mH}$ and $C = 1\ \mu\text{F}$. Using Laplace transform method, find voltage across node for $t > 0$.
6. In the network shown in figure, the switch is closed at $t = 0$. Determine the expression for $i_1(t)$ and $i_2(t)$ at $t > 0$ using Laplace transformation technique. Consider the network is unenergized before the switch is closed.



7. Obtain the open-circuit driving point impedance (Z_{11}) and voltage transfer ratio (G_{21}) for the network shown below.



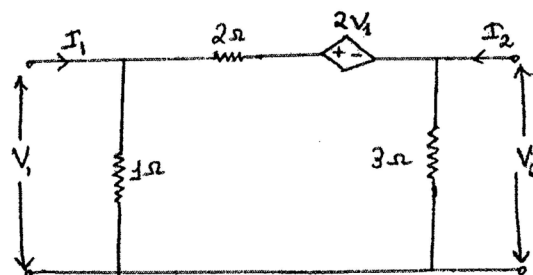
8. Obtain the trigonometric Fourier series of the waveform given below and sketch the line spectrum.



9. For the transfer function below, draw the asymptotic bode plot.

$$H(s) = \frac{20(s+5)}{s(s^2+10s+169)}$$

10. Find hybrid- parameter for the following TPN and check whether the network is reciprocal or not.

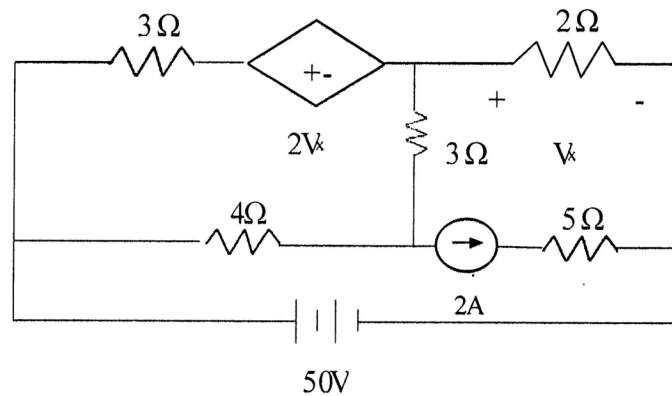


Exam.	Back (New Course)		
Level	BE	Full Marks	60
Programme	BEL	Pass Marks	24
Year / Part	I / II	Time	3 hrs.

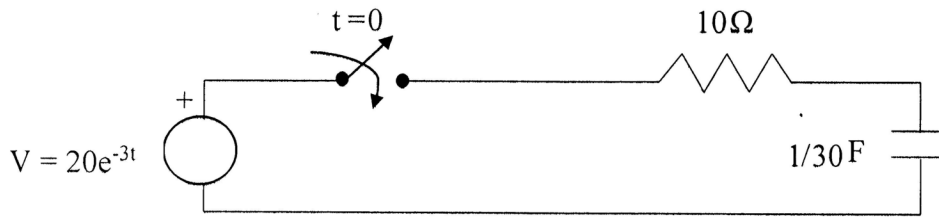
Subject: - Electric Circuit II (EE 151)

- ✓ Candidates are required to give their answers in their own words as far as practicable.
- ✓ Attempt **All** questions.
- ✓ The figures in the margin indicate **Full Marks**.
- ✓ Assume suitable data if necessary.

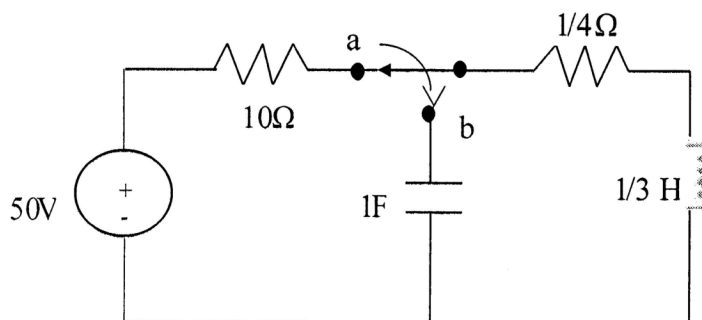
1. In the given circuit, determine the current through 4Ω resistor using loop analysis. [6]



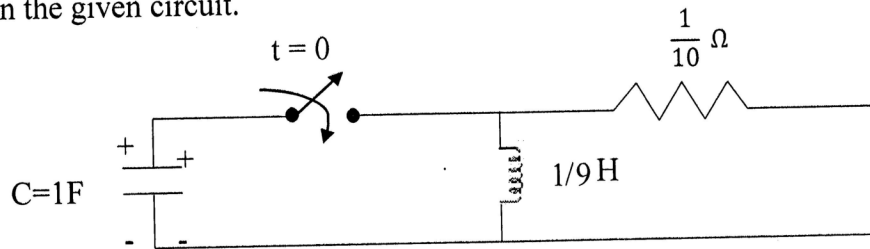
2. With a suitable example, prove that the current through an inductor cannot change instantaneously but voltage does. [6]
3. Using the classical method, find the current through the capacitor for $t > 0$ in the given circuit. [6]



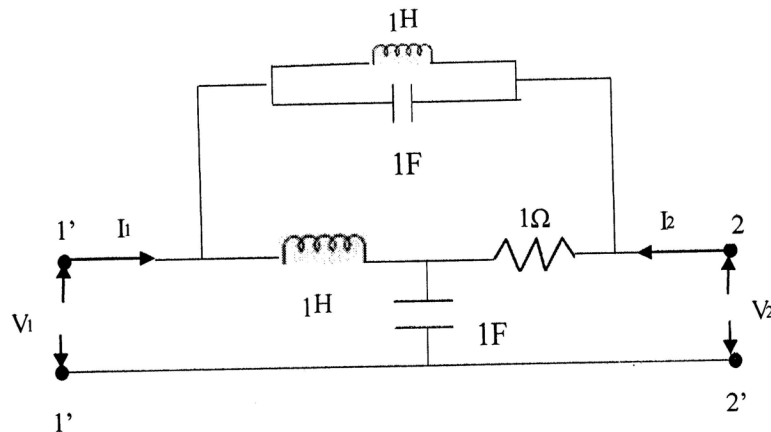
4. In the given circuit, the switch is in position "a" for a long time and then moves to position "b" at $t = 0$. Find the expression for the current and voltage of the capacitor for $t > 0$ using the classical method. [6]



5. Using Laplace's transform method, find the current and voltage across the capacitor for $t > 0$ in the given circuit. [8]



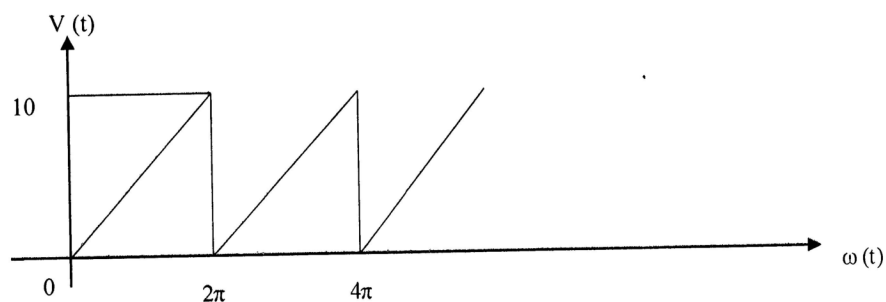
6. For the TPN shown in fig. Find Voltage Ratio Transfer function. [4]



7. For the network function given below, plot Bode diagram. [6]

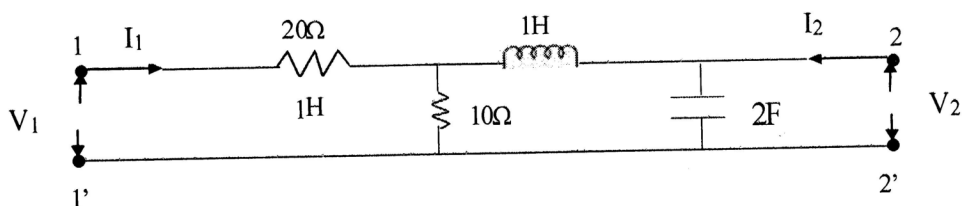
$$N(s) = \frac{10(s+5)}{5(s^2+21s+20)(s+10)}$$

8. For the waveform shown in figure below, find trigonometric Fourier series. [6]



9. Derive the condition for reciprocity of a TPN in terms of hybrid parameter. [6]

10. For the TPN shown in fig, find Y-parameter. [6]

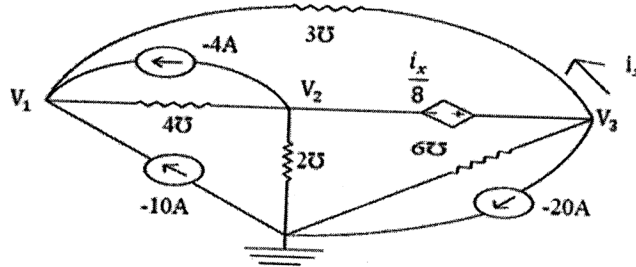


Exam.	Regular (New Course-2080 Batch)		
Level	BE	Full Marks	60
Programme	BEL	Pass Marks	24
Year / Part	I / II	Time	3 hrs.

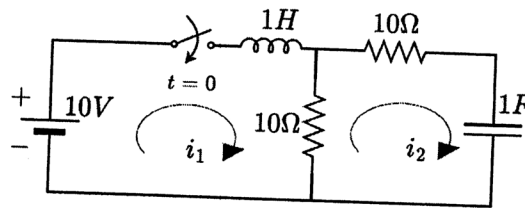
Subject: - Electric Circuit II (EE 151)

- ✓ Candidates are required to give their answers in their own words as far as practicable.
- ✓ Attempt All questions.
- ✓ The figures in the margin indicate Full Marks.
- ✓ Semi log graph paper is to be provided.
- ✓ Assume suitable data if necessary.

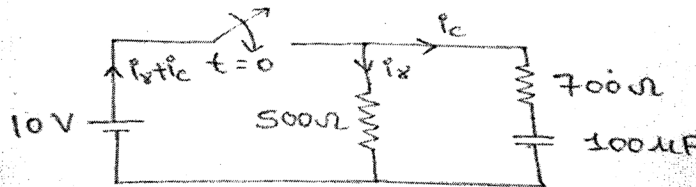
1. Find the node voltages V_1 , V_2 and V_3 for the circuit shown in figure below. [6]



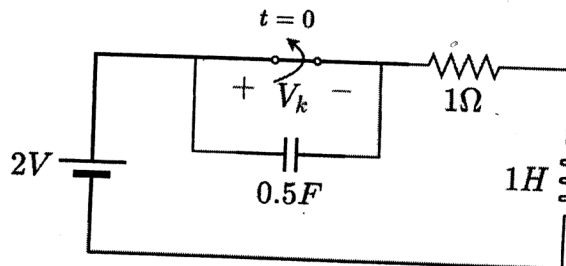
2. In the circuit shown in figure below, the switch is closed at $t = 0$. Determine i_1 , i_2 , i_1' , i_2' , i_1'' and i_2'' at $t = 0^+$. [6]



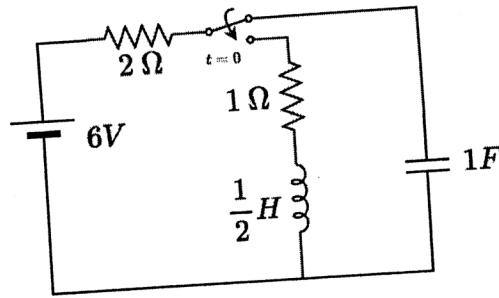
3. Using classical method, find the expression for the current supplied by source in the network shown in figure. [5]



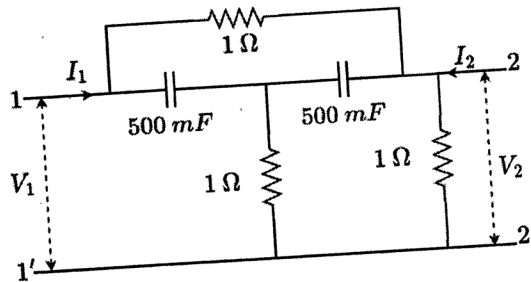
4. The switch is in 'ON' position for long time and suddenly opened at $t=0$. Calculate the expression of voltage V_k and time taken by the circuit to reach $V_k = 1.5$ V. (use classical approach) [6]



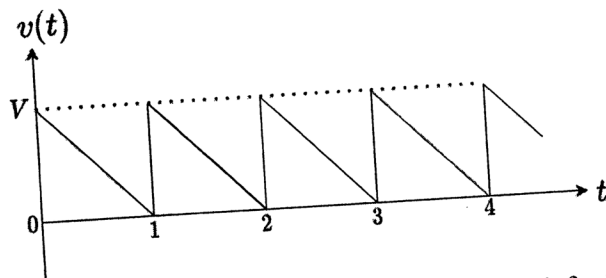
5. Obtain the transient response of R-L series circuit excited by an exponential source. (Use Laplace Transformation method). [4]
6. Obtain the voltage across capacitor if the switch is changed to other position at $t=0$ (Consider the source will be isolated after switching). (Use Laplace transformation method) [6]



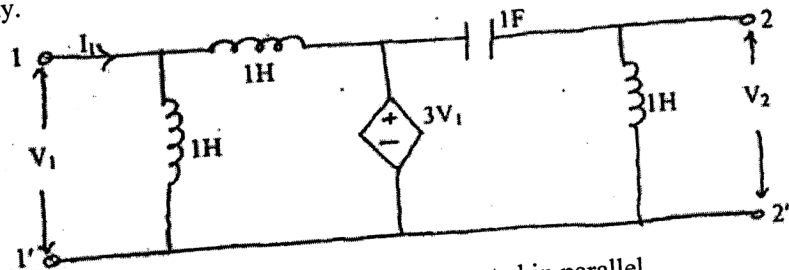
7. Obtain the transfer impedance (Z_{21}) and voltage transfer ratio (G_{21}) for the two-port network shown below. [6]



8. Sketch the bode plot of the network transfer function given by [6]
- $$N(s) = \frac{2(s+20)}{s(s+10)(s+5)}$$
9. The voltage waveform is shown in figure below. Obtain the trigonometric fourier series and plot the line spectrum. [5]



10. Find the T-parameters in the network shown below and also check for its reciprocity and symmetry. [6]



11. Find the equivalent Y parameters of three TPN connected in parallel. [4]
- ***