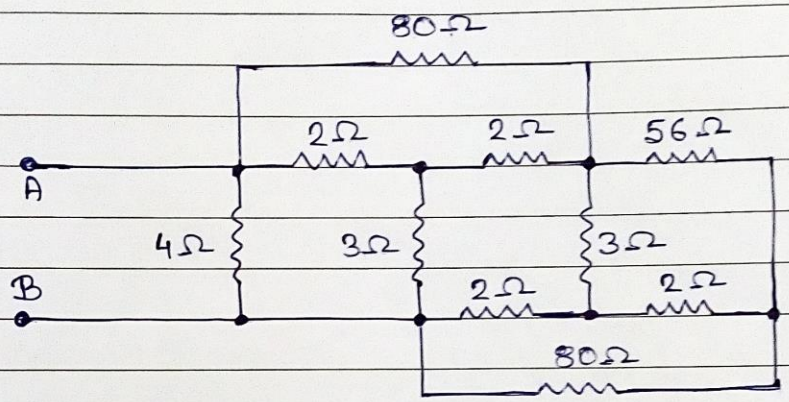
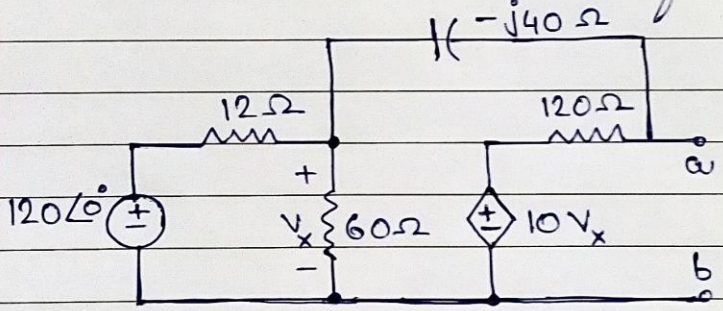
Assignment.

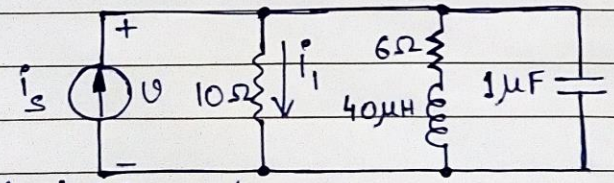
Q) Find the equivalent resistance between terminal A and B :-



Q) Find the Thevenin circuit for terminals 'a' & 'b'

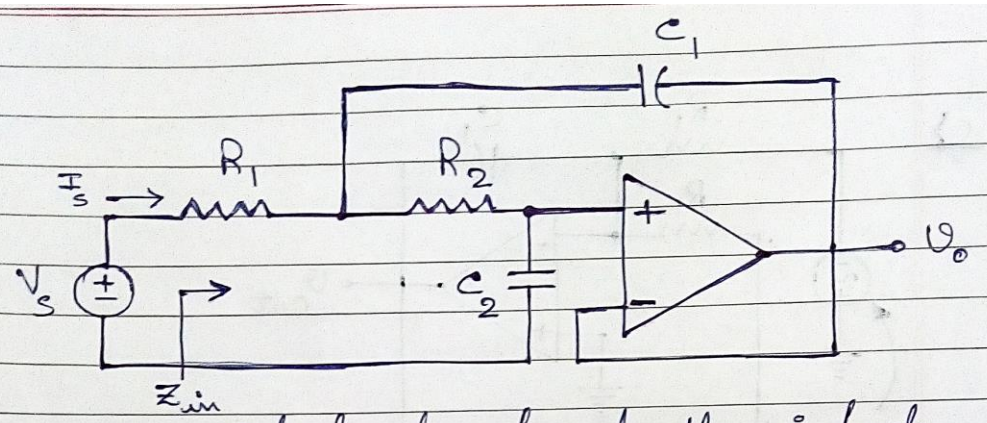


Q)



If $i_s(t)$ and $v(t)$ are in-phase in the steady state, prove that the equivalent resistance/impedance seen by the current source has a phase angle of 0° (or purely resistive). Also, find the resonant frequency of the circuit.

Q1



Assuming ideal opamp, if the input impedance is defined as $Z_{in} = V_s/I_s$, find the input impedance of the circuit above when $R_1 = 10\,k\Omega$, $R_2 = 20\,k\Omega$, $C_1 = 10\,mF$, $C_2 = 20\,nF$ and $\omega = 5000$ rad/s.

NOTE:-

- Each question carries 5 marks.
- Do it manually ONLY, showing clearly all the steps and calculations.
- Answers should be indicated in a box so that its clearly understandable
- Indicate clearly any assumptions, if made.