

Problem Sheet - 4

IEC102

Q.1. The Thevenin equivalent at terminals a-b of the linear network shown in Fig. Q1 is to be determined by measurement. When a $10\text{ k}\Omega$ resistor is connected to terminals a-b, the voltage V_{ab} is measured as 6 V . When a $30\text{ k}\Omega$ resistor is connected to the terminals, V_{ab} is measured as 12 V .

Determine

- The Thevenin equivalent at terminals a-b.
- V_{ab} when a $20\text{ k}\Omega$ resistor is connected to the terminals a-b.

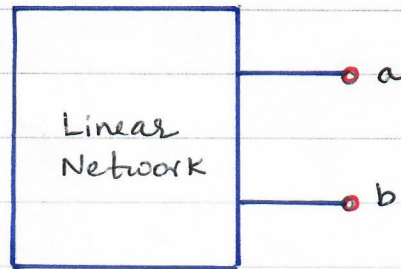


Fig. Q1

Q2 For the bridge network shown in Fig. Q2, find R_{ab} and i .

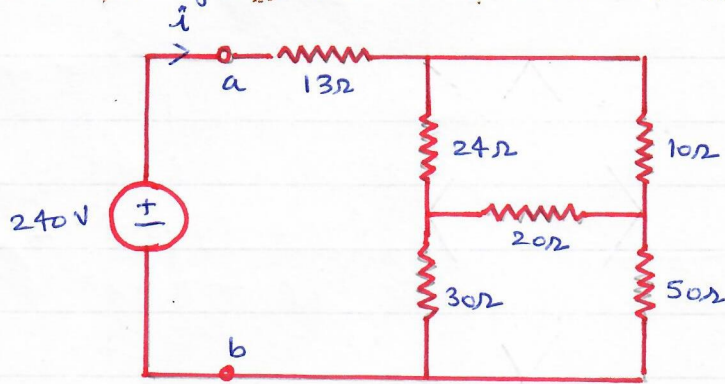


Fig. Q2

Q3 The voltage source $v_s(t)$ in the circuit shown in Fig. Q3a) has the source waveform as shown in Fig. Q3b)

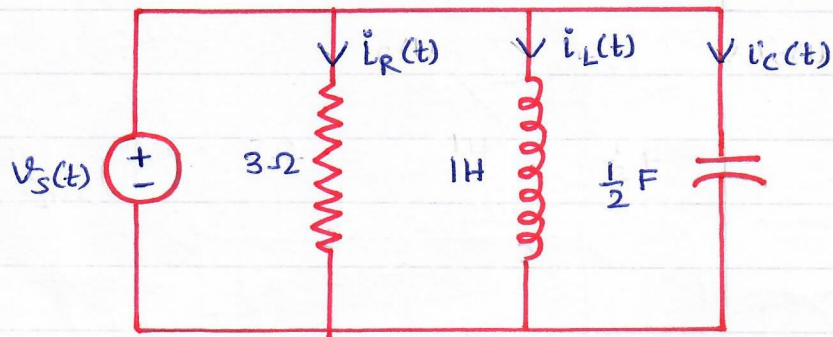


Fig. Q3a)

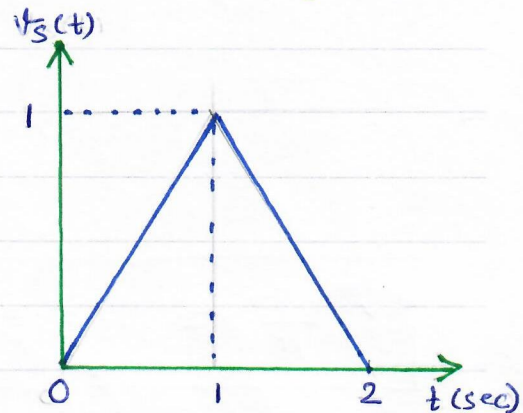


Fig. Q3b)

- Sketch $i_R(t)$
- Sketch $i_C(t)$
- Sketch $i_L(t)$, assume $i_L(0) = 0$.

Q4 For the circuit shown in Fig. Q4, calculate the value of 'R' that will make energy stored in the capacitor the same as that stored in the inductor under dc conditions.

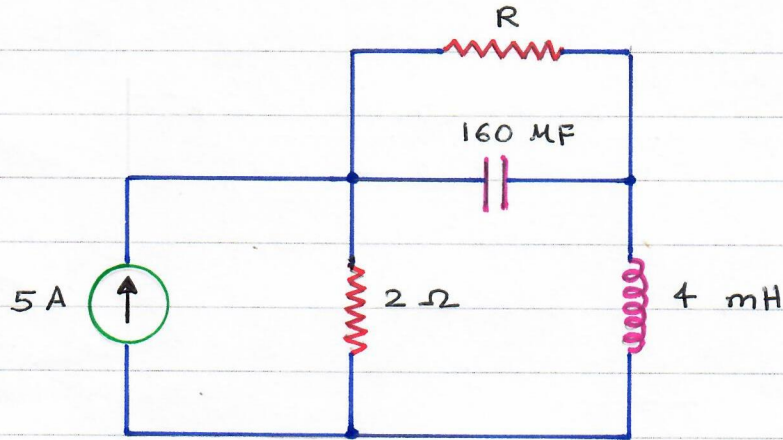


Fig. Q4