Circuit Analysis Techniques

Lecture 4
Tutorial

Lecture delivered by:

Objectives

At the end of this lecture, student will be able to:

- Solve problems on KCL
- Solve problems on KVL,
- Solve problems on Mesh and Nodal analysis

Problems

Problem 1

The current and voltage characteristic of a semiconductor diode in the forward direction is measured and recorded in the following table:

v (V)	0.5	0.6	0.65	0.66	0.67	0.68	0.69	0.70	0.71	0.72	0.73	0.74	0.75
i (mA)	2×10^{-4}	0.11	0.78	1.2	1.7	2.6	3.9	5.8	8.6	12.9	19.2	28.7	42.7

- In the reverse direction (i.e., when v < 0), i = 4 *10^15 A.

- Using the values given in the table, calculate the static and dynamic resistances (R and r) of the diode when it operates at 30 mA, and

- Find its power consumption p.

Problems

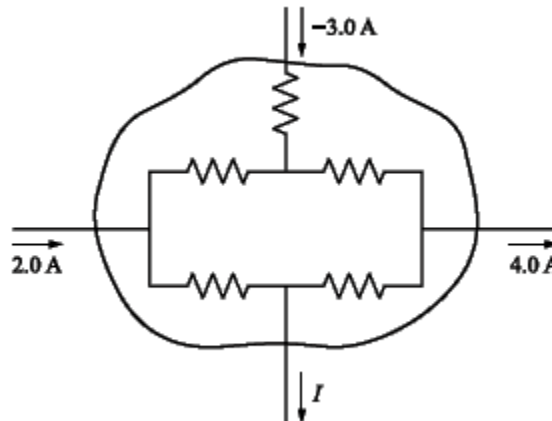## Problem 2

An inductance of 3.0mH has a voltage that is described as follows:

➢For 0 > t > 2 ms, V = 15.0V and, for 2 > t > 4 ms, V = 30.0 V.

➢Obtain the corresponding current and sketch V_L and I for the given intervals.
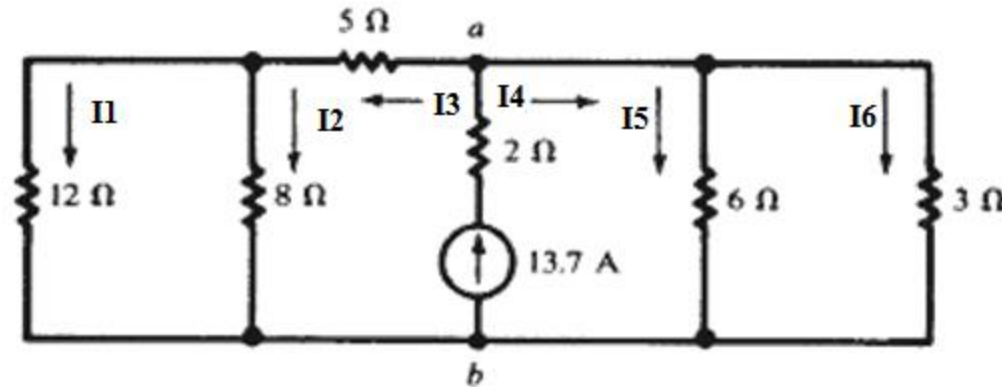
Problem 3

Find the current I for the circuit shown in Fig
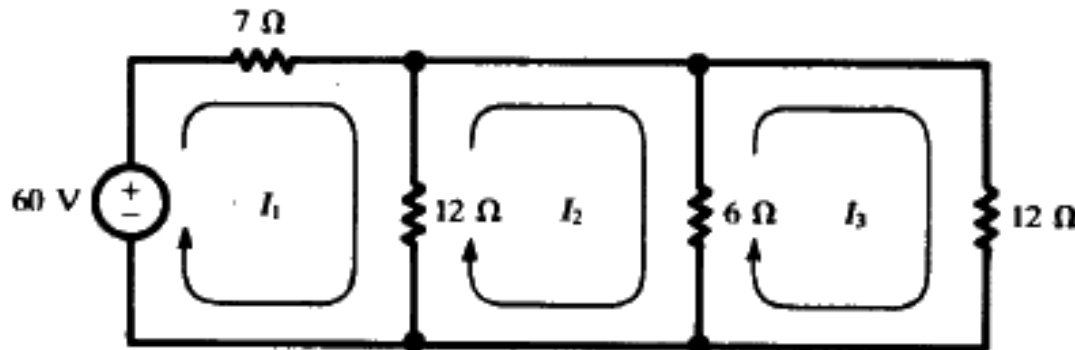
Problems

Problem 4

Find all branch currents in the network
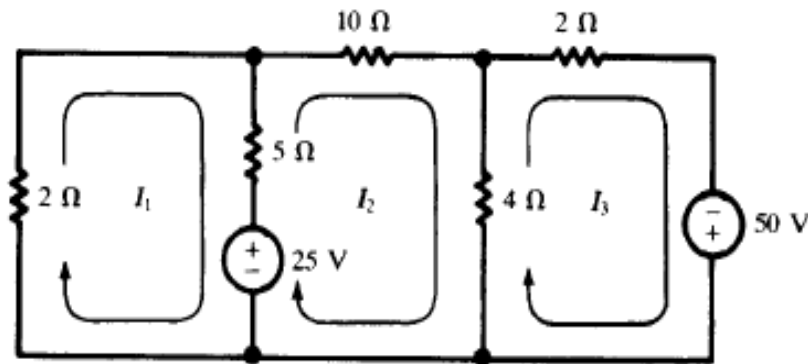

Problem 5
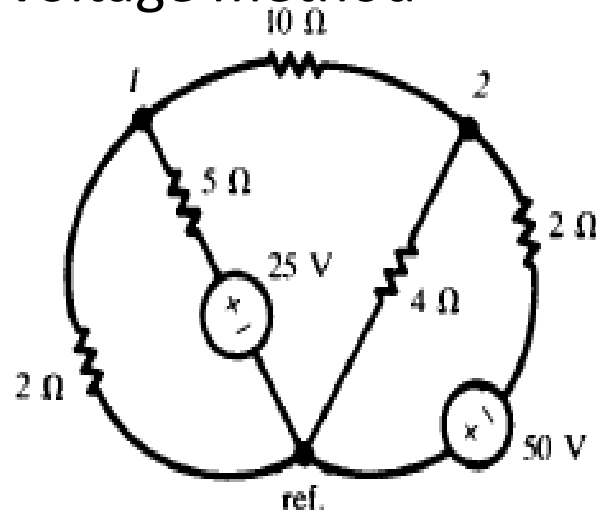
Solve by the mesh current method

Problems

Problem 6

Write the mesh current matrix equation for the network of Fig by inspection, and solve for Currents.

Problem 7

Solve Problem by the node voltage method

Summary

- Problems are solved on KCL

- Problems are solved on KVL

- Problems are solved on mesh and node analysis