

INDUSTRIAL ELECTRONICS N3

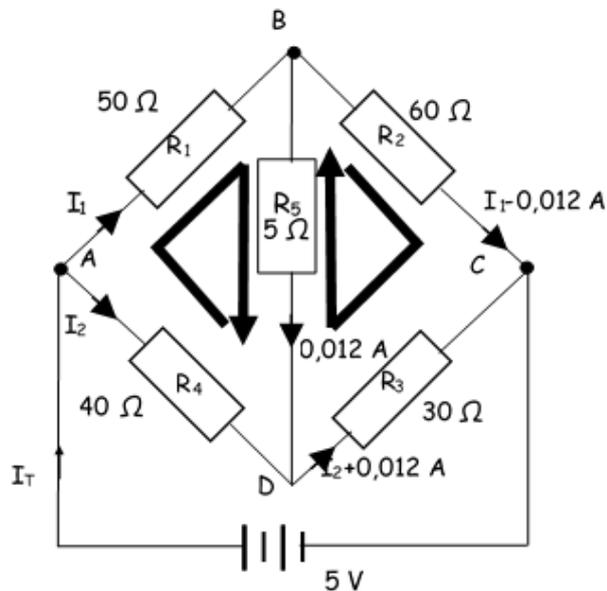
CATCH UP PLAN ACTIVITIES FOR STUDENTS

DATE: 04/05/2020 -15/05/2020

Chapter 1
DIRECT CURRENT
THEORY

1.1 Study FIGURE 1 on the DIAGRAM SHEET and determine, with the aid of Kirchhoff's laws:

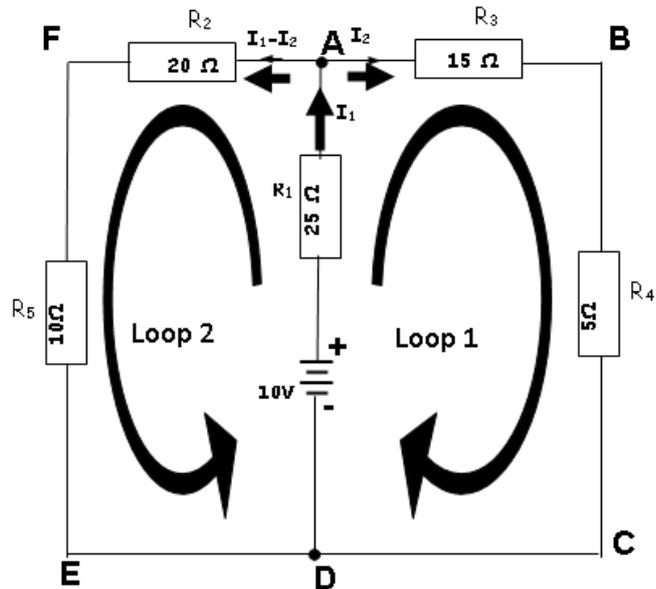
- i. The equation for loop 1 (ABDA). Set up the equation by starting at point A and proceed in the direction of loop 1.
- ii. The equation for loop 2 (BCDB). Set up the equation by starting at point B and proceed in the direction of loop 2.
- iii. The magnitude of currents I_1 and I_2 by making use of the equations in QUESTION i and QUESTION ii.



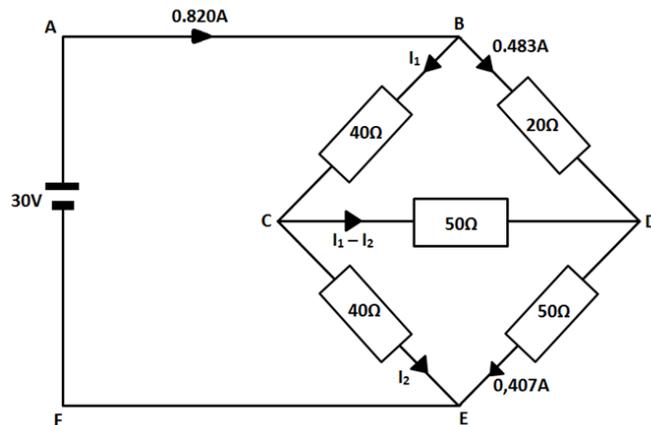
1.2 With aid of a diagram explain Kirchoffs first law.

1.3 With aid of a diagram explain Kirchoffs second law.

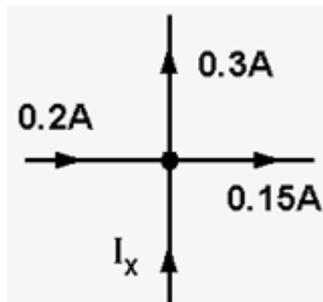
1.4 Study the figure below and use Kirchoffs law to determine voltage through **R2**



1.5 Study the figure below and determine current through junction **[C-D]** by using kirchoffs law



1.6 Determine the unknown current by using kichoffs law



Chapter 2
ALTERNATING
CURRENT THEORY

2. A series LC circuit has a coil of 0,5 H with an internal resistance of 10 ohms and a 100 microfarad capacitor. The components are connected across an alternating current supply of 240 volts with a frequency of 50 hertz.

Consider the given information and answer the following questions

2.1 of the coil. Make a labelled sketch of the circuit and draw a dotted block to show the internal resistance

2.2 Calculate the impedance of the coil.

2.3 Calculate the total impedance of the circuit

2.4 Calculate the current flow through the circuit

2.5 Calculate the voltage across the coil and the voltage across the capacitor.

3. An RLC series circuit with values $R = 150 \Omega$, $L = 23 \text{ mH}$ and with a capacitor of $52 \mu\text{F}$ respectively is connected to a supply voltage of 220 V and a frequency of 50 Hz.

Determine the following

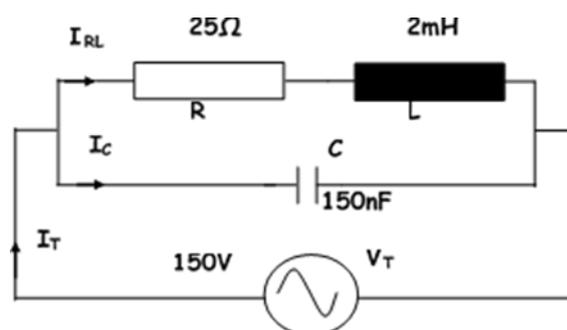
3.1 Inductive reactance

3.2 Capacitive reactance

3.3 Phase angle

3.4 Draw the phasor diagram of the circuit

4. Study the diagram below and answer the following questions



4.1 The resonant frequency

4.2 The dynamic impedance

4.3 The dynamic impedance

4.4 Name THREE conditions of series resonance

5. When a current of 5 A flows through a resistor connected in series with a capacitor, a voltage of 100 V is dropped across the resistor. This circuit is connected to a 230 V, 60 Hz supply

Calculate the following

5.1 Voltage across the capacitor

5.2 Capacitance of the capacitor

5.3 Phase angle between the current and the supply voltage

6. Refer from your text book page 10 and answer the questions

7. Refer from your text book page 4 and practise example 1.1 to understand kirchoffs first and second law

8. Page 9 answer self evaluation exercise 1.2