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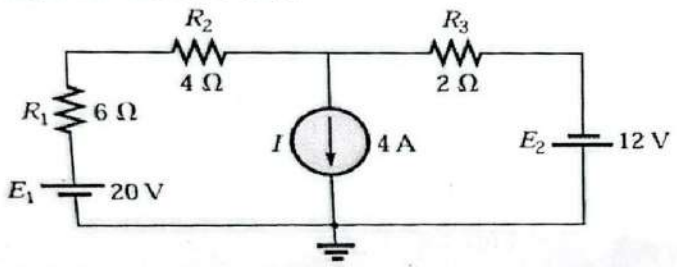
# Daffodil International University

**Department of Textile Engineering (TE)**
**Faculty of Engineering**
**Final Examination, Spring-2026**

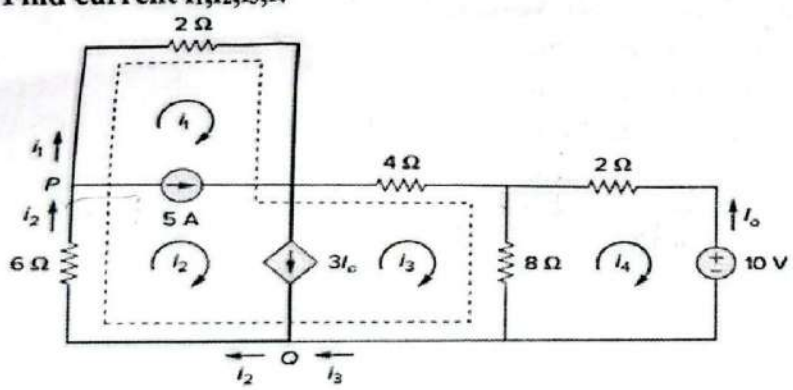
**Course Code: 0713-221** **Course Title: Basic Electrical and Electronic Engineering**
**Level & Term: L2T2** **Full Marks: 40, Time: 2 Hours**
**Course Teacher: Tasnia Noshin Orin (TNO), Amit Kumar Paul (AKP), Sakaid Hosain Shakir(SHS)**

***(Answer <u>any 5 set</u> of the following Questions)***

**1. a. Explain whether you can apply mesh analysis for the given circuit or not and find the currents.** **[CLO-2, C2,C1]** **[4+4]**

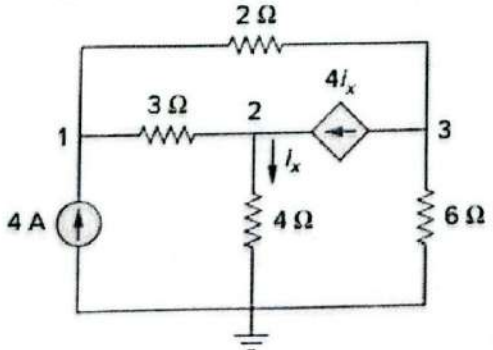



**b. Find current $i_1, i_2, i_3, i_4$**



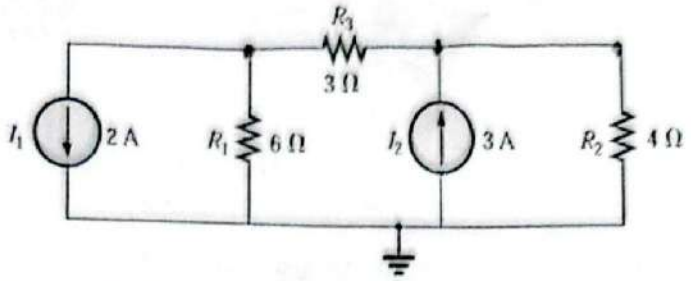

**2. a. List steps to determine node voltages.** **[CLO-2, C1,C5, C2]** **[2+3+3]**

**b. Determine node voltages at three non-reference nodes.**




**c. Calculate the unknown node voltages.**

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3. a. Define: Zenner breakdown, Avalanche breakdown. [CLO-4 C1, C2, C3] [2+4+2]
b. Explain V-I characteristics curve of PN junction diode with proper diagram.
c. Suppose you have a silicon diode with a reverse saturation current ($1.5\times10^{-12}$A). Calculate the diode current if the knee voltage is 0.67V and n=1.5 at room temperature?

4. a. Determine the current Io of the following circuit 4.1 [CLO-2, CLO-3, C5] [4+4]

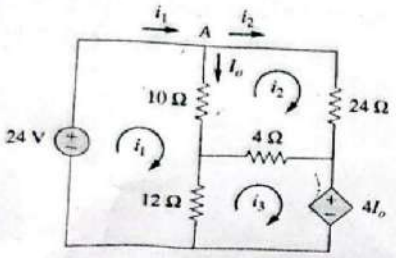



Fig: 4.1

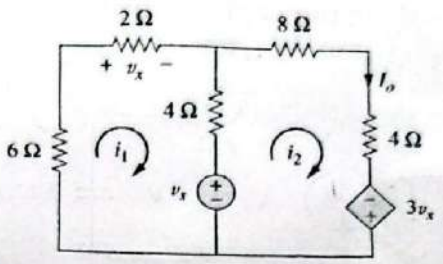
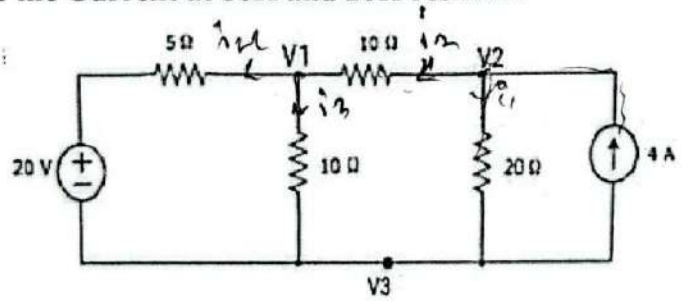



Fig: 4.2

b. For the following circuit 4.2 find $I_o$ when $V_s$=12V & $V_s$=24V and determine whether the circuit is linear or not.

5. a. Determine V1 and V2 using Nodal analysis. [CLO-3, C5,C1] [4+4]
b. Calculate the Current at 10Ω and 20Ω resistor.




6 a. Identify the value of $I_1$ and $I_2$ when the 120 V source is deactivated. [CLO-3, C1,C5] [4+4]
b. Determine $I_1$ when the two voltage sources are both active in the circuit.

