

LAHORE UNIVERSITY OF MANAGEMENT SCIENCES
Department of Electrical Engineering

EE240 Circuits I
Quiz 04 - Section 1 - Solutions

Name: _____

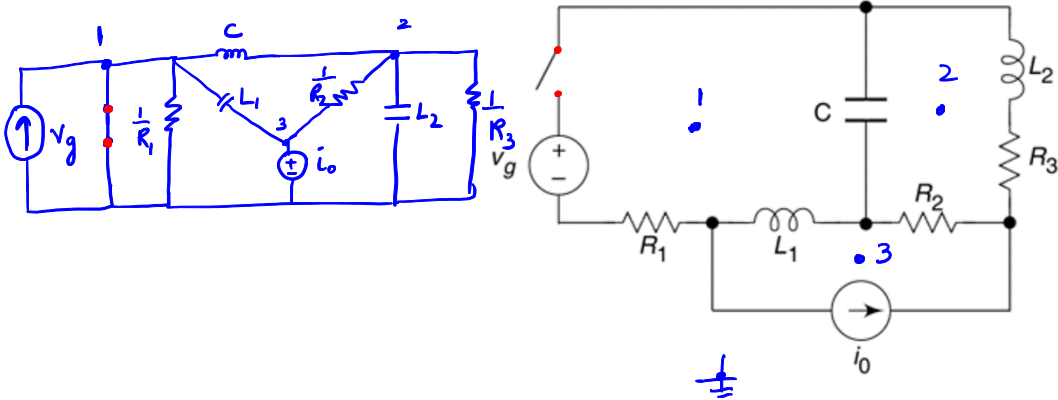
Campus ID: _____

Total Marks: 10

Time Duration: 20 minutes

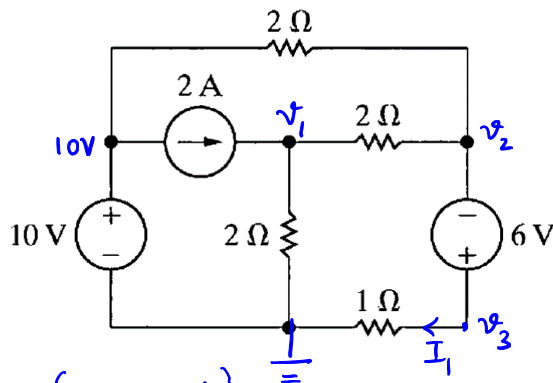
Question 1 (6 marks)

Draw the dual of the circuit shown below. Open switch appears as closed switch in the dual circuit.



Question 2 (4 marks)

Use either *nodal*, loop or source transformation to determine the current through the 1Ω resistor.



Super Node: $v_3 = v_2 + 6$

① $\frac{v_1}{2} + \frac{v_1 - v_2}{2} = 2$

② $\frac{v_2 - 10}{2} + \frac{v_2 - v_1}{2} + \frac{v_3}{1} = 0$ (Super Node)

① $2v_1 - v_2 = 4 \Rightarrow 2v_1 - v_3 + 6 = 4 \Rightarrow 2v_1 - v_3 = -2$

② $2v_2 - v_1 + 2v_3 = 10 \Rightarrow 4v_3 - v_1 = 22$

$-2v_1 + 8v_3 = 44$
 $\Rightarrow v_3 = \frac{42}{7} \text{ V}$

$I_1 = \frac{v_3}{1} = \frac{42}{7} \text{ A}$