EE240 Circuits I
Quiz 03 Solutions

Total Marks: 10
Time Duration: 20 minutes

Question 1 (5 marks)

Consider the network in the Figure below, where the coupled inductors are marked with the dots. Write down the network equations using Kirchhoff voltage law.
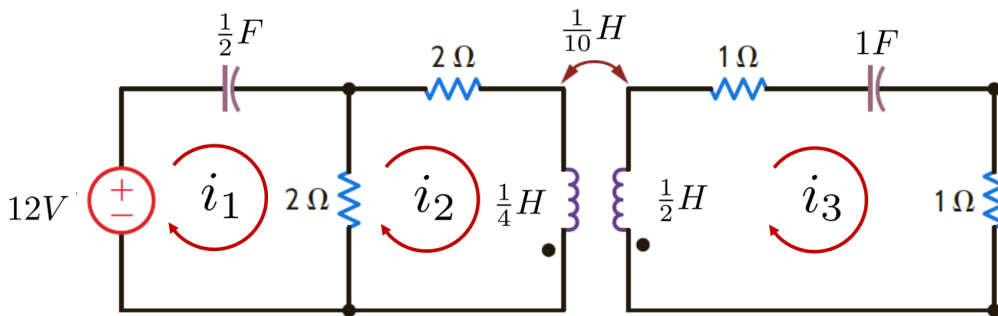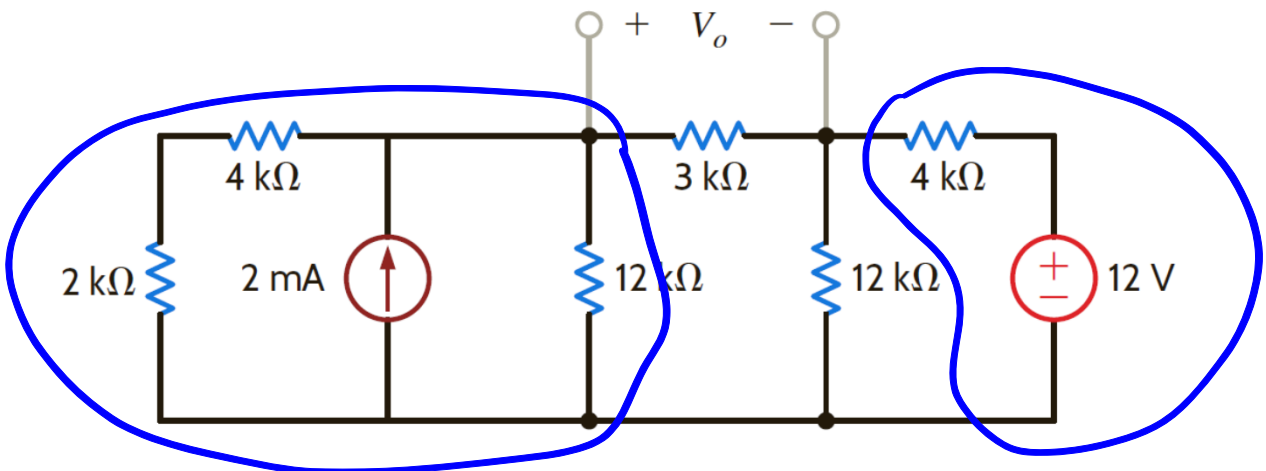

Solution:

$$2 \int i_1 dt + 2i_1 - 2i_2 - 12 = 0$$

$$-2i_1 + 4i_2 + \frac{1}{4}\frac{di_2}{dt} - \frac{1}{10}\frac{di_3}{dt} = 0$$

$$-\frac{1}{10}\frac{di_2}{dt} + 2i_3 + \int i_3 dt + \frac{1}{2}\frac{di_3}{dt} = 0$$

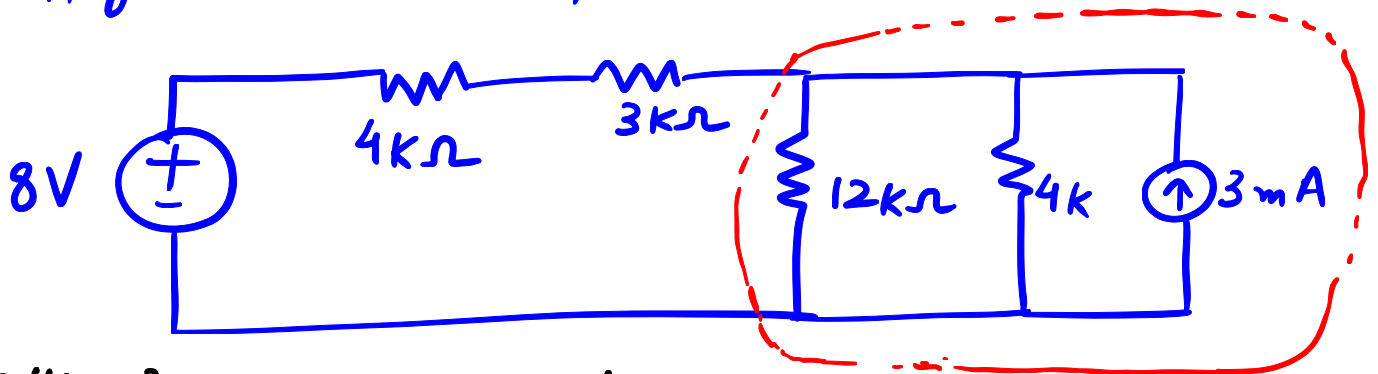**Question 2** (5 marks)

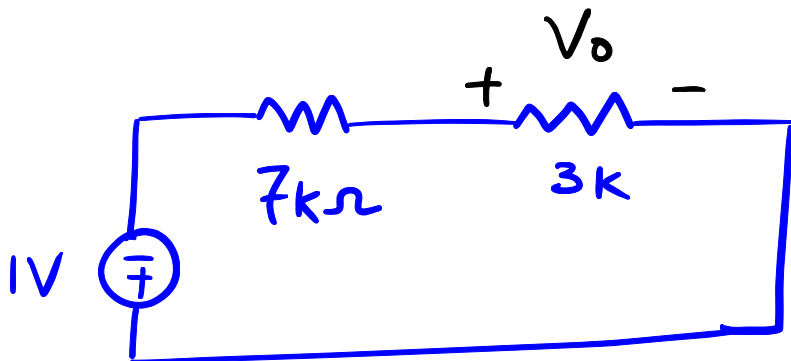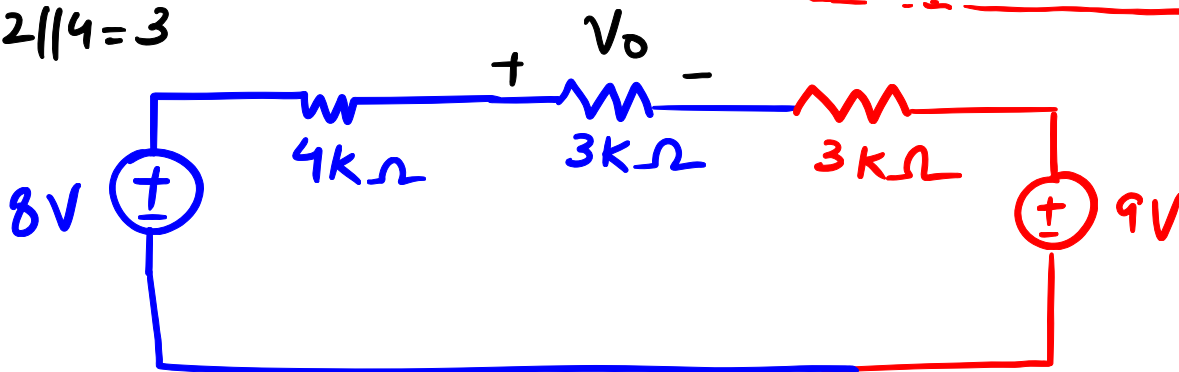Determine V_o in the circuit below using source transformation.

$(2K+4K) \| 12K = 4K$ (This is in parallel with 2mA source)

* Apply source Transformations

$12 \| 4 = 3$

V_0

$\Rightarrow V_0 = (-1)\dfrac{(3k)}{10k}$

$$\boxed{V_0 = -0.3V}$$