LAU
الجامعة اللبنانية الأميركية
Lebanese American University

LAU School of Engineering
Department of Electrical and Computer Engineering

ELE 305: Introduction to Electrical Engineering
Exam 1 – Spring 2017

Duration: **1 hour 40 minutes**
Date: 27/02/2016
Start Time: 7:00 pm

Dr. Elie Abou Diwan
Dr. Jihad Jawad Fahs
Dr. Harag Margossian

Name: _____ ID#: _____

INSTRUCTIONS:

- Answer each of the following questions in the space provided.
- You can use both sides of the sheets for answers.
- Solutions written outside this booklet will not be graded.
- This is a closed-book exam
- Programmable calculators and smart devices are not allowed.
- The number of points for each question is specified next to it.
- The total number of points is 100.

1	2	3	4	5	Total
/30	/15	/20	/10	/25	/100

Question 1 (30 points)

Consider the network in Figure 1.

a) What is the equivalent resistance seen by the element connected between nodes A and B in the circuit of Figure 1?
b) If the charge leaving the element is as given in Figure 2, sketch the voltage V_{AB} from t=0 to 9ms. *Hint:* if you could not solve part (a), use R_{eq}=10Ω

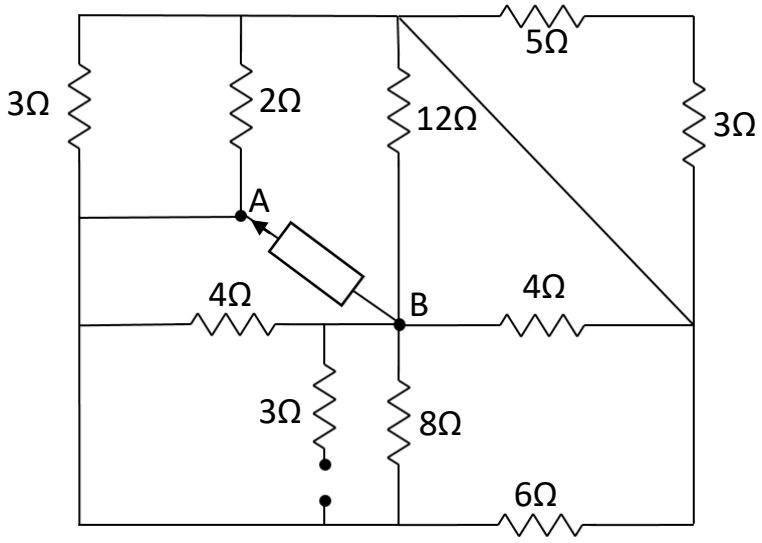

Figure 1

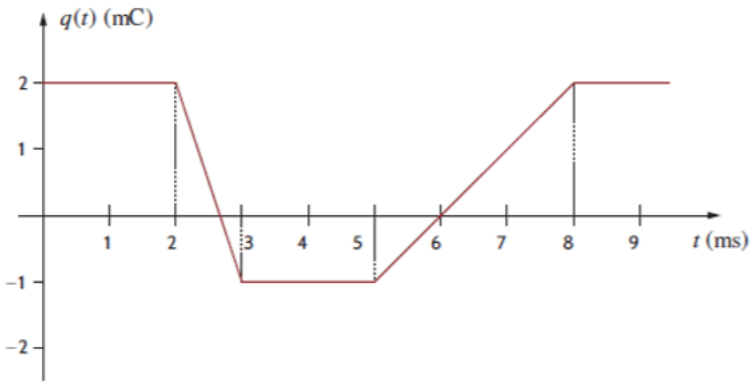

Figure 2

Question 2 (15 points)

Use mesh analysis to calculate the power delivered by the 3mA source in the network shown in Figure 3.

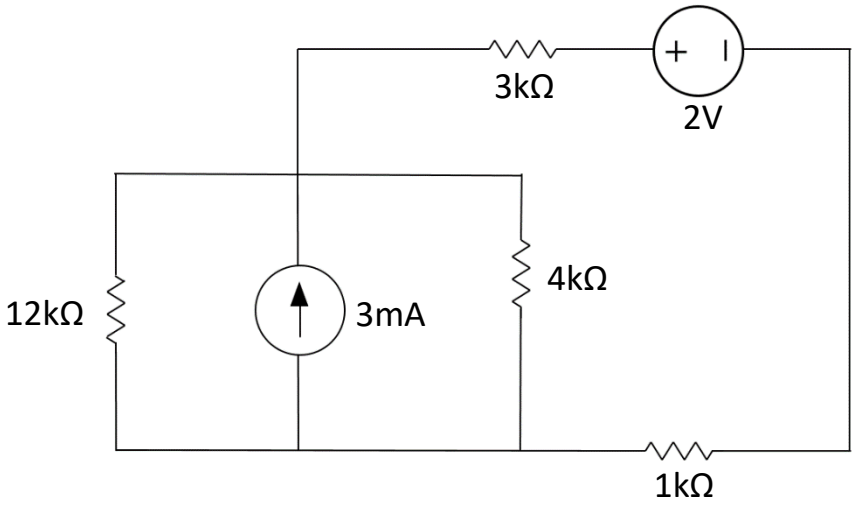

Figure 3

Question 3 (20 points)

Use superposition to find V_o in the network in Figure 4.

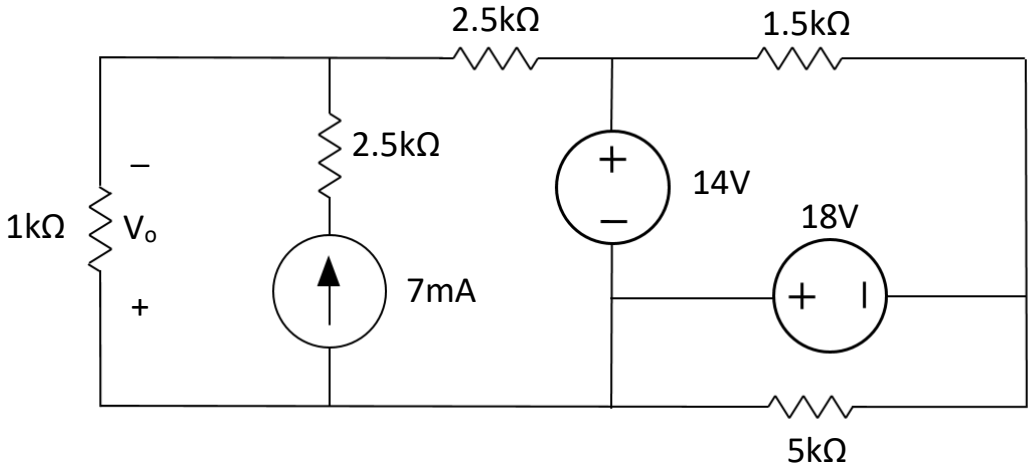

Figure 4

Question 4 (10 points)

Use source transformation to find V_o in the network in Figure 5.

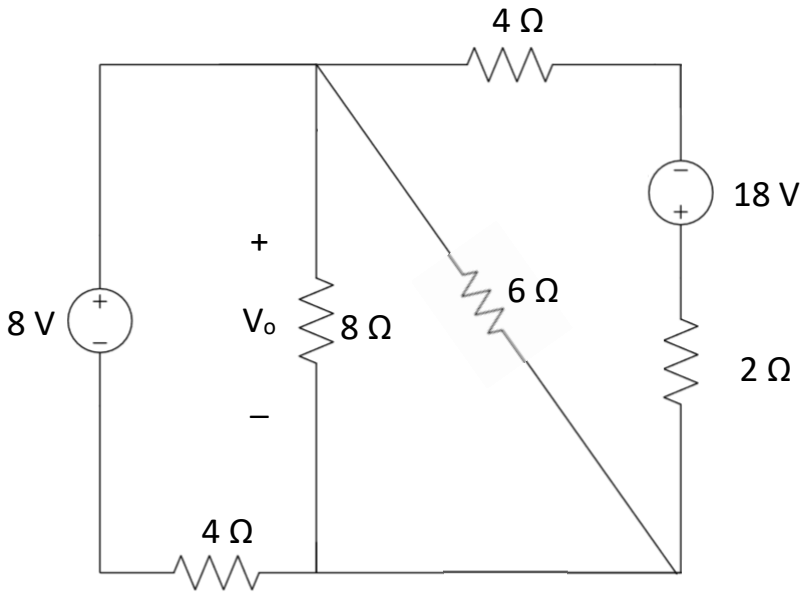

Figure 5

Question 5 (25 points)

Consider the network in Figure 6.

a. Find the thevenin equivalent of the circuit between nodes A and B as seen by the resistances R1 and R2.
b. Find an expression for R_2 in terms of R_1 that would ensure maximum power transfer to R_2.

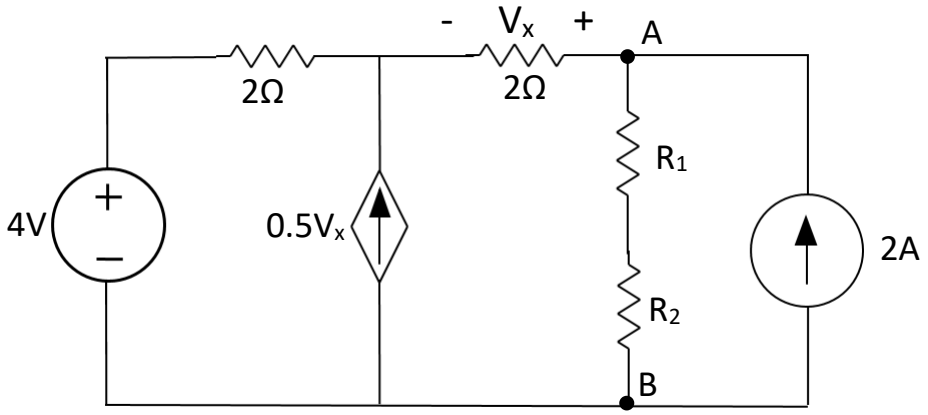

Figure 6