1. 單位
2. logic

Midterm Examination II

Electric Circuit

2018/12/2

1. (10%) Find the current I_o of the circuit shown in Fig. 1 by using the superposition theorem.

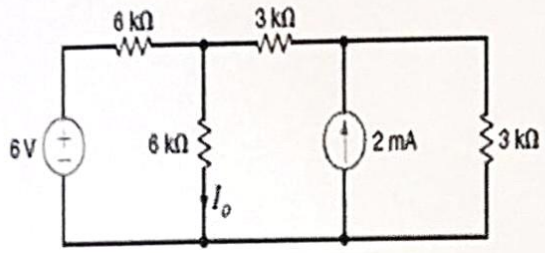

Fig. 1

2. (10%) For the circuit in Fig. 2, Please find its Thevenin's equivalent circuit.

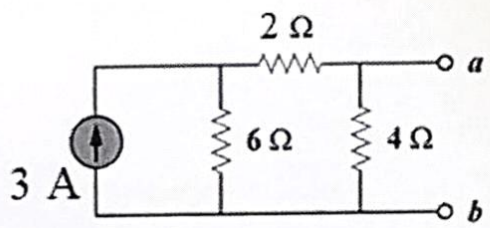

Fig. 2

3. (10%) For the circuit in Fig. 3, please
   (a) find R_L =? such that the power delivered to R_L is maximum.
   (b) determine the maximum power P_{Lmax} =?.

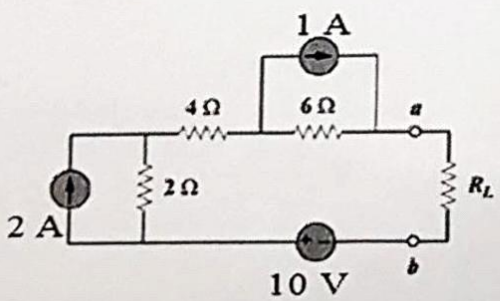

Fig. 3

4. (10%) For the op amp circuit in Fig. 4, determine the value of v_2 such that $v_0 = -17.5\ V$.

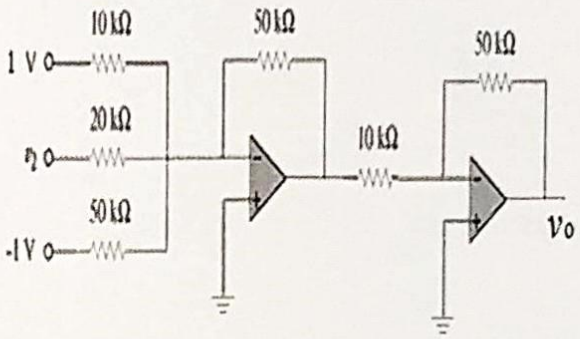

Fig. 4

5. (10%) Obtain the output v_o in the circuit of Fig. 5.

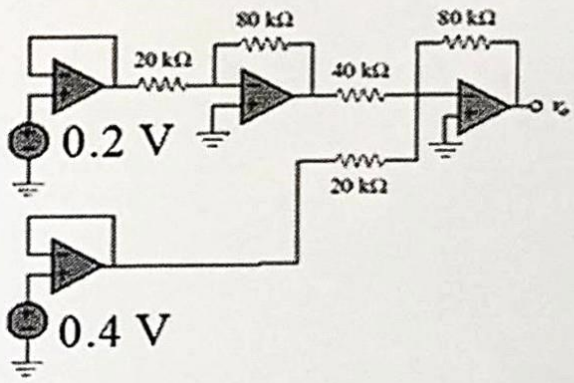

Fig. 5

6. (15%)

(a) - (9%) A 1-m H inductor has the following current

$$i(t) = \begin{cases} 10A, & t < 0 \\ Ae^{-100\,t} + Be^{-600\,t}\ (A), & t \geq 0 \end{cases}$$

If the inductor has the initial voltage $v_L(0) = 0.5\ V$, please find:

(i) the constants A and B,