THE INTERNATINONAL UNIVERSITY (IU) – VIETNAM NATIONAL UNIVERSITY – HCMC

Midterm Examination

Date: ……April 23, 2020……..

Duration: 150 minutes

SUBJECT: Principles of EE1	
Dean of School of Electronics & Telecommunications Engineering Signature: Full name:	Lecturer: Dr Huynh Tan Quoc Signature: Full name:

INTRODUCTIONS:

1. This is an OPEN-BOOK examination.
2. Students takes 2 decimal digits in calculation
3. Discussion and material transfer are strictly prohibited
   Total pages: 05 (including this page)

Problem 1: (10 pts) Calculate the power for all the elements in the circuit shown in Figure P1 and state whether it is absorbed or delivered. Suppose V_A= 20 V, i_a= 5 A, i_b= 4 A, V_D= 11 V, i_d= 1 A, V_F= 8 V.

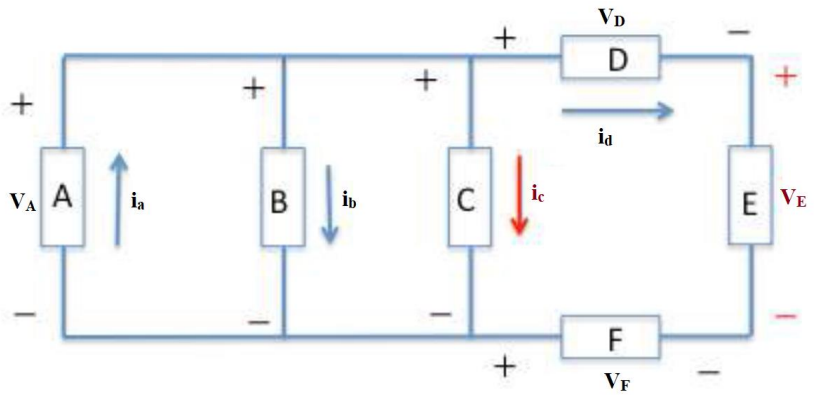

Figure P1

a) Find i_c and V_E?
b) Calculate the power for all the elements in the circuit shown and state whether it is absorbed or delivered.

Problem2: (10 points) For the voltage divider circuit shown, with V_i= 60 V, R_1= 2 kΩ, R_2 = 4 kΩ, R_L= 4 kΩ,

a) Find the voltage *vo*1 under no load condition (Figure P2.a)
b) Find the voltage *vo*2 under loading condition (Figure P2.b)

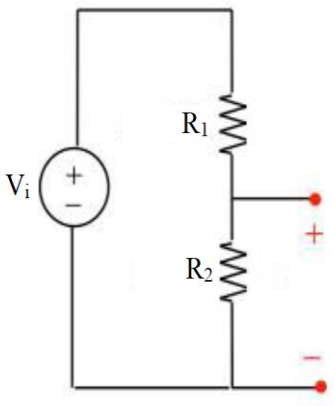

Figure P2.a

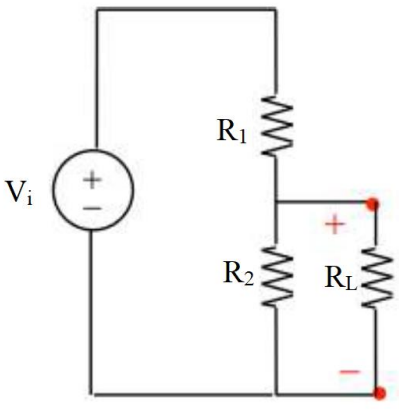

Figure P2.b

Problem3: (10 points) Find I_o with V = 11 V, R_1 = 7 kΩ, R_2 = 5 kΩ, R_3 = 5 kΩ, R_4 = 1 kΩ, R_5 = 5 kΩ

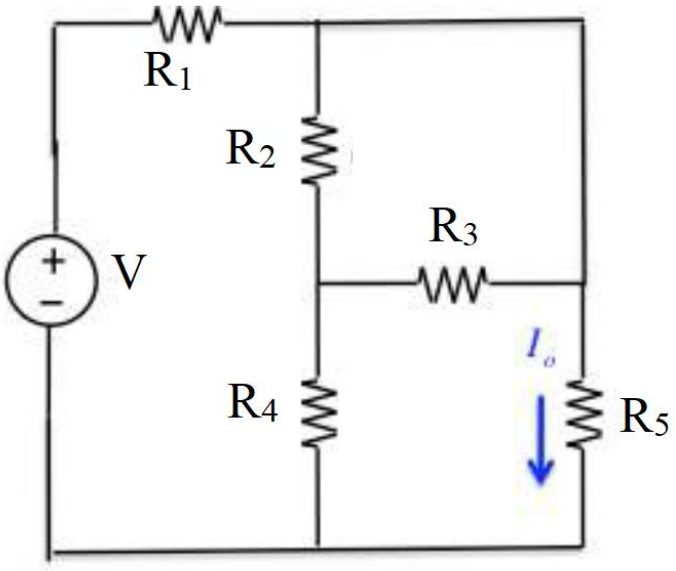

Figure P3

Problem4: (10 points) For the circuit shown, such that I = 0.1 A, V = 15 V, R_1 = 52 Ω, R_2 = 32 Ω, R_3 = 126 Ω, R_4 = 63 Ω.

Use the superposition principle to find the voltage V_o

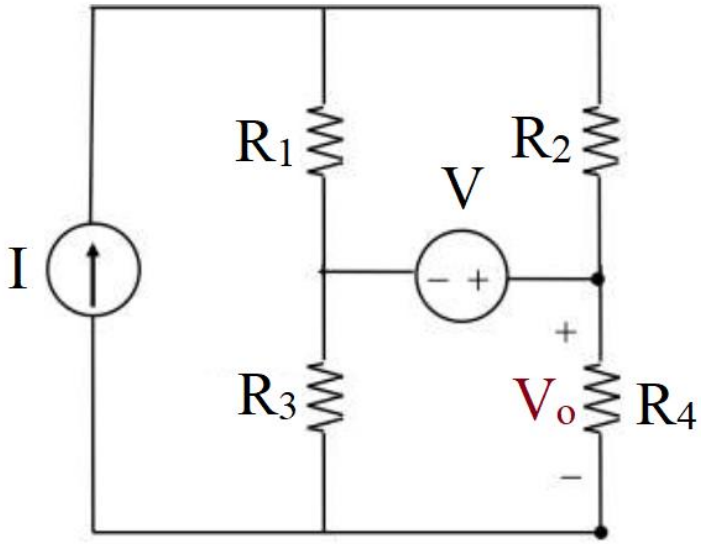

Figure P4

Problem 5: (20 points) Determine the currents i_1, i_2, i_3, i_4 in the following circuits with reference to the indicated direction. Let V= 84 V, I= 9 A, R1= 42 Ω, R2= 14 Ω, R3= 49 Ω, R4= 28 Ω.

a) By using node voltage method.
b) By using mesh current method.

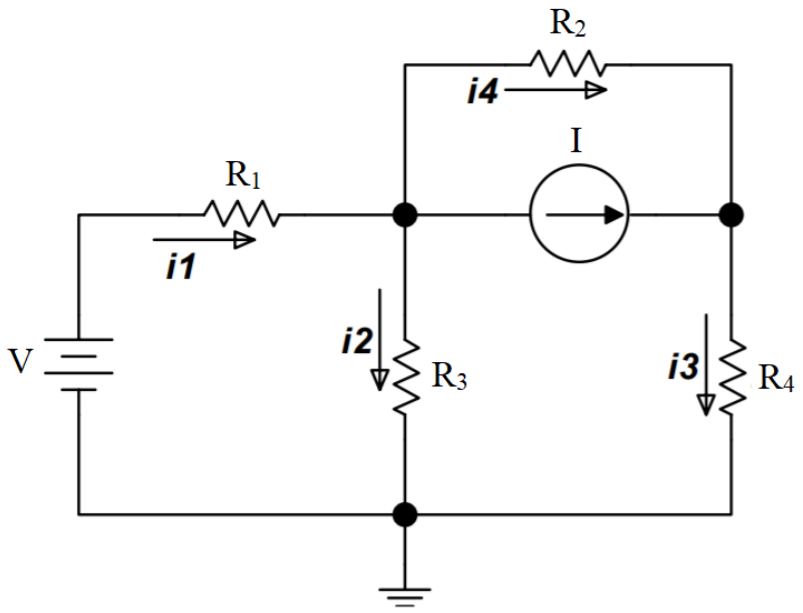

Figure P5

Problem 6: (20 points) Consider the circuit in Figure P6. Suppose V1 = 4 V, R1 = 4 kΩ, R2 = 4 kΩ, V2 = 19 V, R3 = 10 kΩ, R4 = 8 kΩ;

a) Find the Thevenin equivalent for the circuit between node (a) and (b) as seen by the resistive load *RL*

b) Find the value for *RL* such that the voltage across the load *VL*= 1 *V*, Calculate the power delivered to the load

c) Find the value for *RL* such that the current the power delivered to the load is maximum, Calculate the power delivered to the load

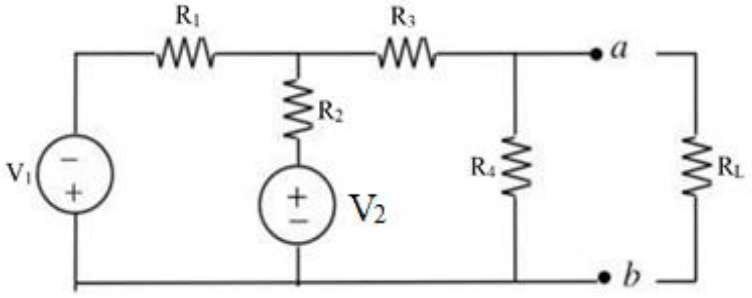

Figure P6

Problem 7: (20 points) For the OP.AMP circuit shown in Figure P7, Let V_i= 4 V, R_1= 5 kΩ, R_2= 9 kΩ, R_3= 9 kΩ;

Assume it is ideal, find the value of *Rf* such that *Vo*= 10 *V*

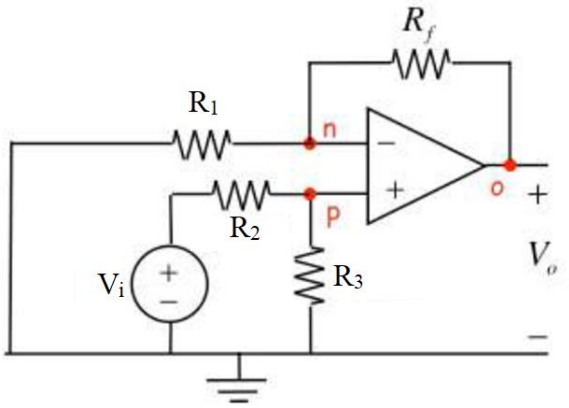

Figure P7