

電路學(EE2210)第一次隨堂考

2015年3月11日

時間：10 分鐘

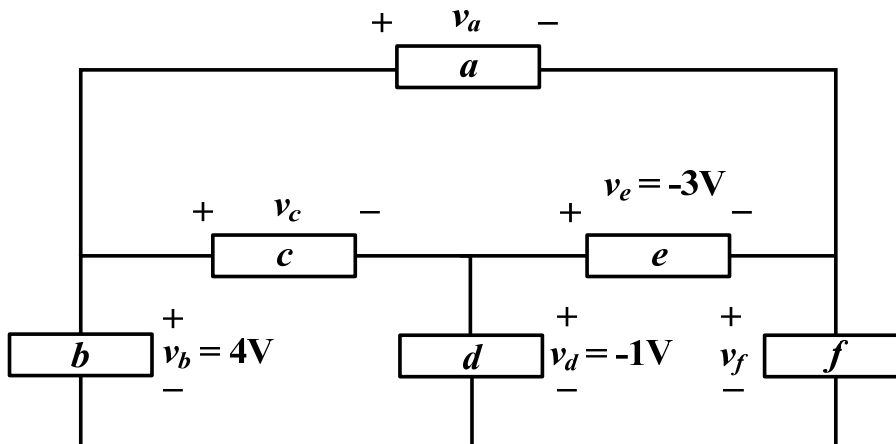
Close Book

學號： _____

姓名： _____

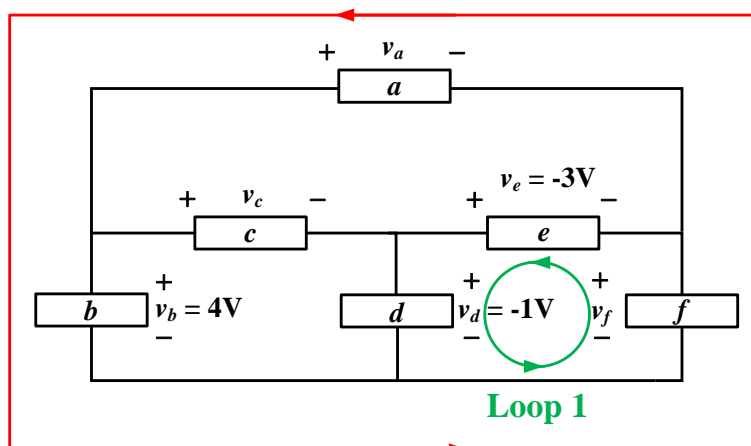
For the circuit as shown below, there are six elements which observe the *Associated Variables Convention*. Among the six elements, the voltages for three elements are given on the figure. The current for element a is $i_a = 2A$, for element c is $i_c = 3A$, and for element f is $i_f = 1A$. By using the KVL and KCL, please find

- (i) the voltages of element f and a (v_f and v_a),
- (ii) the currents of element e and d (i_e and i_d),
- (iii) the power of element d (p_d).



Solutions:

(i)



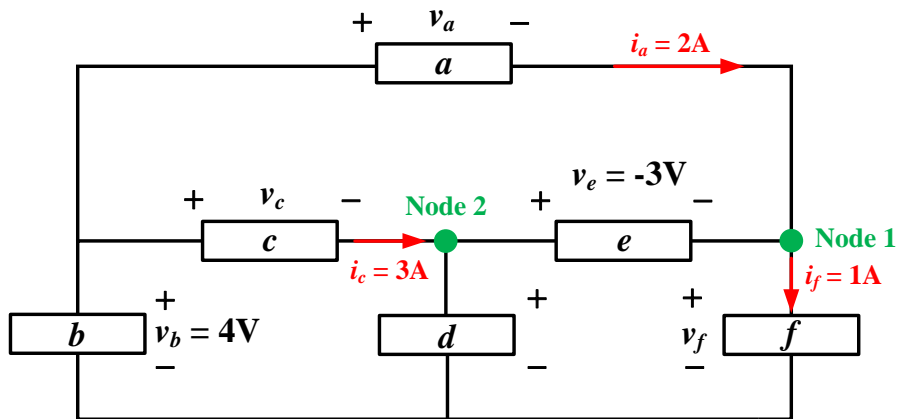
Loop 2

To find the voltages across the element, we need to apply KVL to loop 1 and loop 2:

To find v_f , we can apply KVL to loop 1: $-(-1)+(-3)+v_f = 0 \Rightarrow v_f = 2V$

To find v_a , we can apply KVL to loop 2: $-4 + v_a + v_f = 0 \Rightarrow v_a = 2V$

(ii)



To find the branch current, we need to apply KCL to node1 and node 2:

To find i_e , we can apply KCL to node 1: $2 + i_e - 1 = 0 \Rightarrow i_e = -1A$

To find i_d , we can apply KCL to node 2: $3 - i_d - i_e = 0 \Rightarrow i_d = 4A$

(iii)

The power of element d is simply the product of v_d and i_d : $p_d = v_d \times i_d = (-1) \times 4 = -4W$

(i) $v_f =$ 2V , $v_a =$ 2V ,

(ii) $i_e =$ -1A , $i_d =$ 4A ,

(iii) $p_d =$ -4W .