

ISLAMIC UNIVERSITY OF TECHNOLOGY (IUT)
ORGANISATION OF ISLAMIC COOPERATION (OIC)

DEPARTMENT OF ELECTRICAL AND ELECTRONIC ENGINEERING

Mid-Semester Examination

Course No.: EEE 4101

Course Title: Electrical Circuit I

Winter Semester, A.Y. 2018-2019

Time: 90 Minutes

Full Marks: 75

There are **4 (four)** questions. Answer **any 3 (three)** questions. All questions carry equal marks. Marks for parts of the questions are indicated in the right margin. Programmable calculators are not allowed. Do not write on this question paper. Symbols carry their usual meanings.

1. a) The charge entering the upper terminal of the BOX in Figure 1(a) is shown below. How much energy is absorbed by the BOX between 0 and 9 seconds? 13

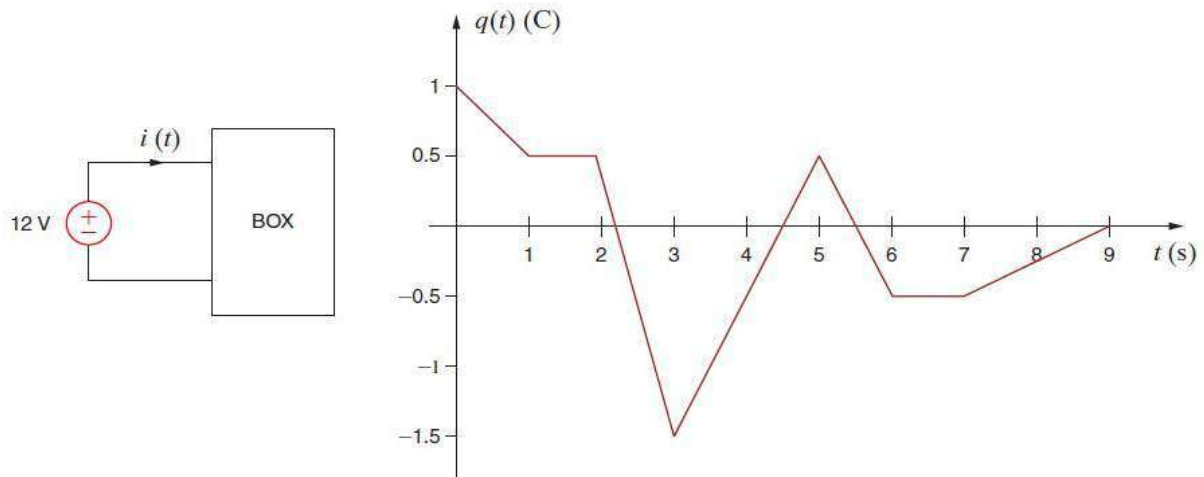


Figure 1(a)

- b) Find the power absorbed/supplied by the dependent source shown in Figure 1(b). 12

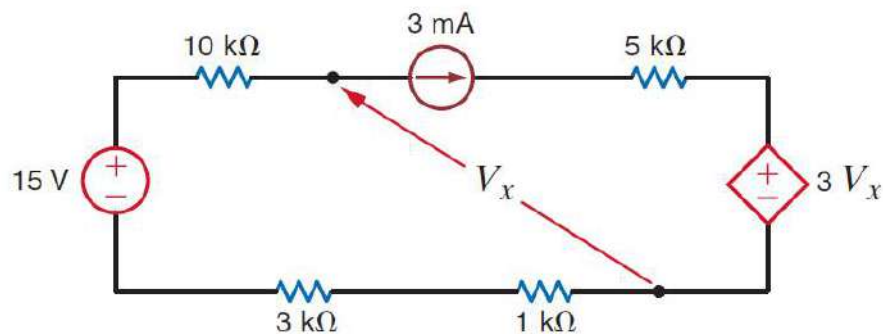


Figure 1(b)

2. a) An element is represented by the relation between current and voltage as $v = 3i + 5$. 13

Determine whether the element is linear or not.

b) Calculate the node voltages v_1 , v_2 and v_3 in the circuit of Figure 2(b).

12

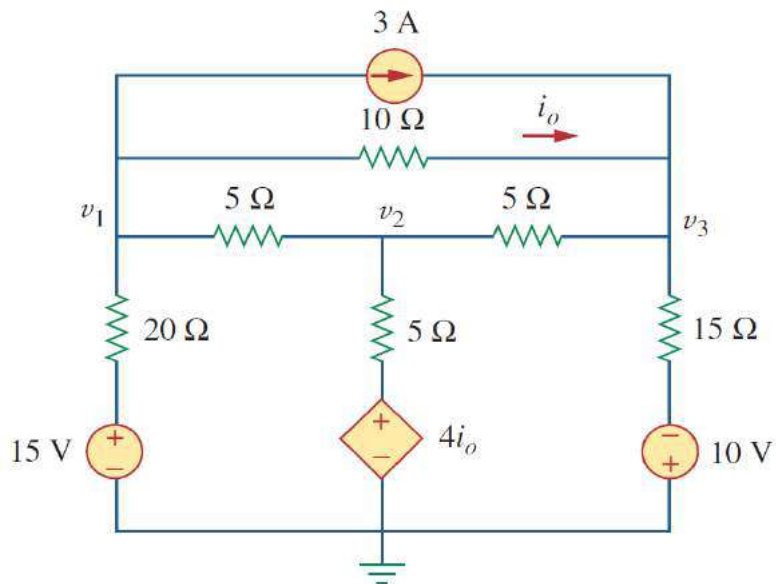


Figure 2(b)

3. a) Determine the values of the node voltages of the circuit shown in Figure 3(a).

13

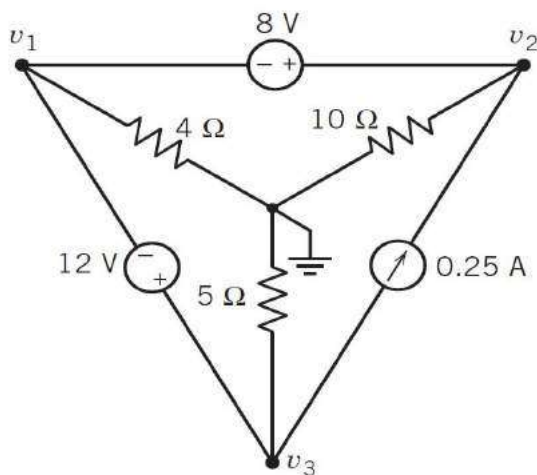


Figure 3(a)

b) Find V_o in the circuit of Figure 3(b) using mesh current analysis.

12

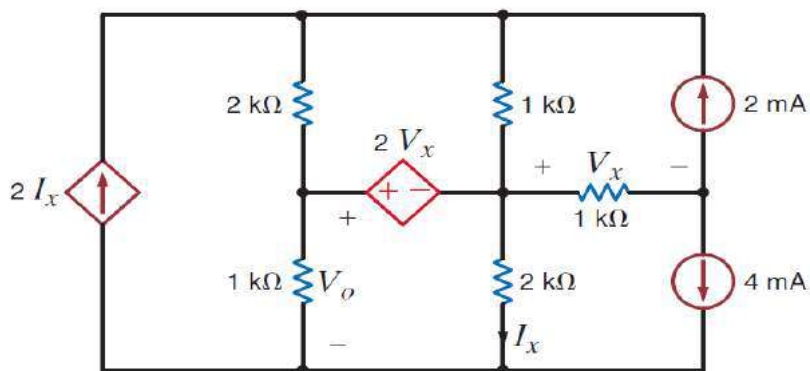


Figure 3(b)

4. a) Find I_o in the circuit of Figure 4(a) using superposition.

13

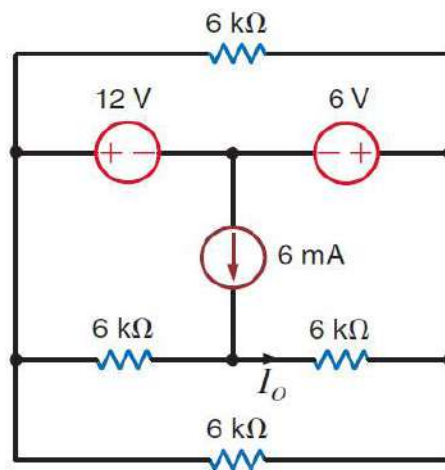


Figure 4(a)

b) Calculate the maximum power that can be transferred to R_L in the circuit of Figure 4(b).

12

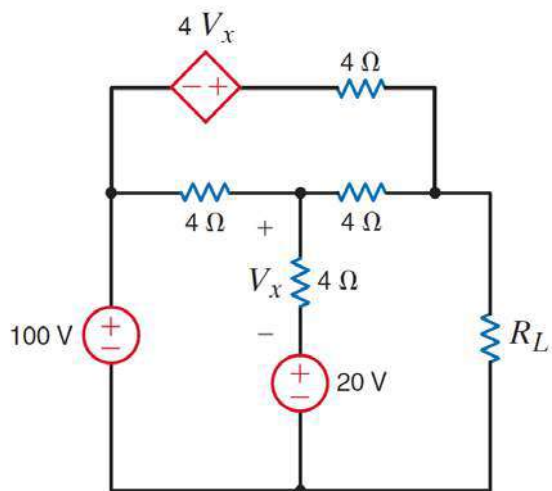


Figure 4(b)