**CONCODIA UNIVERSITY**

**Department of Electrical & Computer Engineering**

**ELEC-275/4: Winter 2012**

**Midterm Exam**

**Date: February 29, 2012 Time: 90 Minutes.**

**Dr. S. K. Das Answer all the questions.**

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1. (a) Replace the circuit to the right of ***a-b*** of Fig.1 by its equivalent single resistance R­eq ;

(b) then find the current **I1** and **I2** . (4 marks)

**9** ****

**12 volts**

**6** ****

**4** ****

**16** ****

**8**

2 ****

**72** ****

I1

I2

***a***

***b***

Req

Fig. 1.

2. Using **nodal analysis**, find **V1** , **V2**, and **I**  of Fig. 2.

( 6 marks)

**16 V**

**2 A**

**8 **

**6 **

**8 **

**16 **

V1

V2

**8 **

**Vref = 0**

I

Fig. 2.

3. Using **mesh analysis**, find **I1** , **I2**, and **V** of Fig. 3.

I3

2 A

8 ****

2 ****

2 ****

V2

6 ****

**+** **V -**

I1

I2

I1

I3

**+ -**

18 volts

22 volts

4 ****

3 ****

Fig. 3.

4. (a) Replace the circuit to the left of ***a****-****b*** of Fig. 4 by its **Thevenin** equivalent. Draw this equivalent circuit.

(b) Use this Thevenin equivalent to find **Vo ,** the voltage across the load RL.

(c) Will this load (i.e. RL = 6 ) draw maximum power from the source? Justify your answer.

(7 marks)

***a***

**3 Amps**

**2** ****

**8 **

**15 **

**4 **

Vo

**RL = 6 **

**+**

**\_**

\_

***b***

**4 volts**

Fig. 4.

5. Replace the circuit of Fig. 5 (between points ***a*** and ***b***) by one with a single equivalent capacitance and a single equivalent inductance. ( 3 marks)

8 F

6 F

3 F

***a***

***b***

3 mH

14 mH

10 mH

5 mH

15 mH

3 mH

Fig. 5.

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