EECS70A Spring 2010

Midterm2-Grading Criteria

Problem 1) 20 Points

12 points given for correct voltages

8 points for setting up the correct nodal equations (2 points each, only 1 point if there is a small mistake, like the wrong sign or wrong value for resistance)

4 points for solving the equations:

2 points for the correct elimination or Kramer's rule, 2 points for the correct final answer with units (1 point for each correct final answer)

8 points given for correct currents

5 point for the correct equations,1 point each

3 points for correct final results (3 points if all 5 answers are correct, 2 points if 3 or 4 answers are correct, 1 if 1 or 2 answers are correct)

-2 points if the unit is wrong or no units.

Problem2) 20 points

3 points given for each correct mesh equation

1 point given for solving the equation using elimination or Cramer's rule.

2 points given for correct final values for mesh currents

3 points for KCL equations to find the currents (1 point for each equation)

2 points given for correct final values for element currents.

2 points for correct power equation.

1 point is given for the correct final answer for the power.

-1 point for wrong/missing units

Problem 3) 20 points

15 points given for calculation of V:

3p. for Req(2p. for the relation, 1p. for final answer)

3 points for Ceq

3 points for τ (1point for units or ms)

3 points for the correct equation for V(t)

3 points for the final answer, (1 point for unit)

5 point for i1(t): 3 point for the right equation (-2 for wrong resistor value)

2 point for final answer (1 point for unit)

Only 1 point for i(t=0)

Problem4) 20 points

6 points for R_{th}:

Method1: short the voltage source and draw the correct circuit (1 p.)

Show that the two leftmost resistors are in series (1p.)

2k||1k=3/2K (1p.)

2/3K+2K=8/3K (1 p.)

8/3K||1K=8/11K (2 p.)

Method2: first find V_{th} and I_n, then

$R_{th}= V_{th}/I_n$ (4p. for the equation)

2p. for the final correct answer

10 points for Vth, or I_n: (Whichever is found with circuit analysis)

1p. for the correct circuit diagram, with a-b open

Method 1: Equivalent resistant and voltage/current division

Correct R_{eq} (2 p.)

Total Current (2p.)

Current division (2 p.)

Method 2: mesh analysis

3p. given for each correct mesh equation

Method 3: nodal analysis

1 p. for each correct node equation except for the super node.

2 p. for the super node.

3 points for the correct final equation for I or V and correct final value

4 points for V_{th} or I_n that is fount with the relation $V_{th}=R_{th}x\ I_n$

2 point for the relation, 2point for the final answer.

If two separate circuit analysis is used to find V_{th} and I_n, 7 points is given for each.

Problem5) 20 points

8 points given for converting L and R valued into impedances.

3 points for showing that R_1 and L_1 are in parallel (Z1).

3 points for showing that R_2 and L_2 are in parallel (Z2).

6 points for showing that Z1 is in series with Z2.

-1 point if one assumes R1=R2=R, and/or L1=L2=L

-2 points if the solution is right but the inverse relation for parallel impedances is used ($z_{eq}=1/R+1/j\omega L$)

-10 points if someone uses L values instead of jωL to find the impedance

-2 points if someone uses L values instead of jωL to find the impedance but replaces L with the impedance at the final stage.

-6 points if someone uses L values instead of jωL to find the impedance and replaces L with the impedance at a later stage, but the substitution is done in a wrong way.
