Grading criteria for midterm1:

Problem 1) 20 points

5 points for showing that R1 and R3 are in series and shorted.

   2 points if one finds out they are in series but not short-circuited.

5 points for showing that R2, R4 and R6 are in parallel. -2 for using wrong equation for parallel resistors.

   2 points for showing R2||R4 or R6||R4 or R4||R6. -1 for each wrong parallel equation.

5 points for showing that R5 and R7 are in parallel.

4 points for showing that R2||R4||R6 is in series with R5||R7

   3 points if only one of the resistors is misplaced.

   1 points if more than 1 resistor is misplaced but the idea is still correct.

1 point for the final correct answer

Problem 2(35pts):

4 points is given for the KCL equation that leads to solving the seperate currents.

5 points is given for the correct current value (i1 - i3)

4 points is given for the correct voltage value (v1 - v4)

Partial credit will be given if students used the wrong current values to calculate the voltages (2pts given instead of 4pts)

Partial credit will be given if students used the wrong polarity sign (3

pts instead of 5 pts for current or 3 points instead of 4 pts for voltage)

problem 3(25pts):

3 points is given for KCL equation that leads to solving i2.

3 points is given for the correct value of i2.

3 points is given for KCL equation that leads to solving i1.

3 points is given for the correct value of i1.

3 points is given for the correct V=IR equation for V1.

3 points is given for the correct value of V1.

3 points is given for the correct V=IR equation for V2.

3 points is given for the correct value of V2.

1 points is given for the correct value of i0.

Partial credit is given in a similar way as problem two.

Problem 4) 20 points

5 points for the correct power equation.

5 points for using the right value for the series resistance of which 3 points is given for the correct potentiometer resistance.

5 points is given for correct calculation of the resistors current and voltage in terms of α.

4 points if the sign is wrong. 2 points if only I or only v is correct. and the other one is wrong.

5 points for the final correct answer.

Only 1 or 2 points (depending on the mistake) if there is a partial mistake in the final replacement or calculation.

4points if the sign is wrong.

No points if the current, voltage or resistance of a different element is used.

-2 points if no units.