

EE 201 Exam 1

September 16, 2003

Name SOLUTIONS

ID # _____

- The exam is closed notes, closed book
- No calculators allowed on the exam
- Do not open the exam until told to by the proctors
- Put your name on both the question sheet and the scantron answer form.
- Put your section number on the scantron sheet.

- Sections:

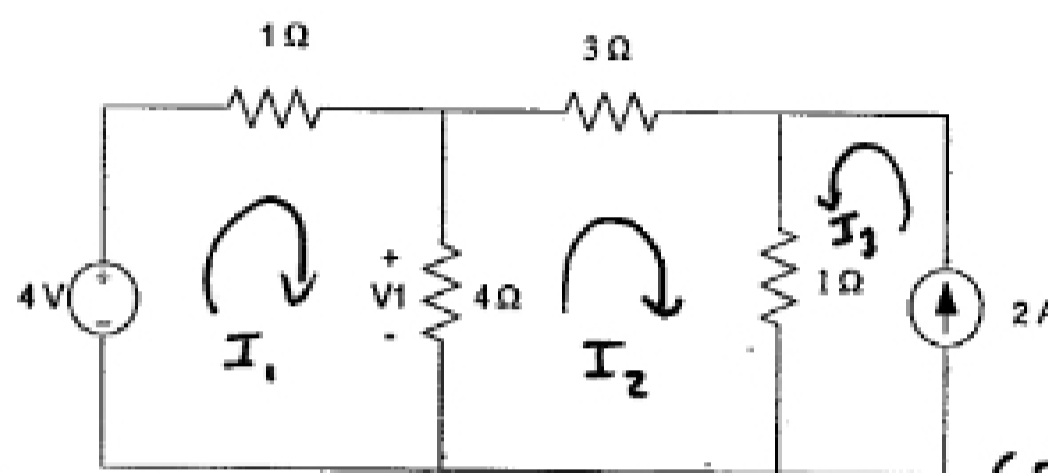
<u>Time</u>	<u>Section</u>	<u>Scantron code</u>
7:30 a	Section 1	0001
11:30 am	Section 2	0002
2:30 pm	Section 3	0003

- The exam consists of 20 multiple choice questions worth 5 points each.
- Keep your scantron hidden when you are not using it.
- The cheating policy for this exam follows Purdue University rules. If you cheat on the exam, you will be punished as dictated.

1. Which of the following statements is (are) true?

- a. The derivative of power is energy
- b. The integral of charge is current
- c. Electrons travel in the opposite direction of current**
- d. B & C
- e. A, B, & C

2. Find V_1 in the circuit below.



$$I_3 = 2A$$

$$-4 + I_1(1) + (I_1 - I_2)4 = 0$$

$$(I_2 - I_1)4 + I_2(3) + (I_2 + 2)(1) = 0$$

$$(5I_1 - 4I_2 = 4) \times 2$$

$$+ (-4I_1 + 8I_2 = -2)$$

$$6I_1 = 6$$

$$I_1 = 1A$$

$$I_2 = 1/4 A$$

a. 3V

b. 5V

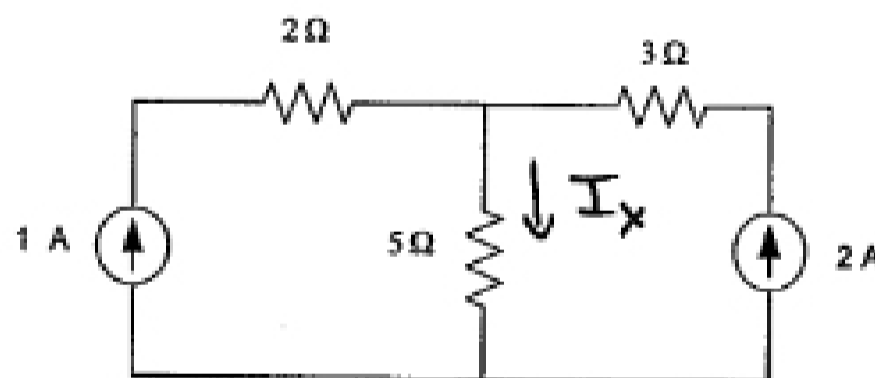
c. -1V

d. 2V

e. -3V

$$V_1 = (I_1 - I_2)(4\Omega) = 3V$$

3. Consider the circuit below, find the power absorbed by the 5Ω resistor.



$$I_x = 1A + 2A = 3A$$

$$P = I_x^2 R = 9 \times 5 = 45W$$

a. 35W

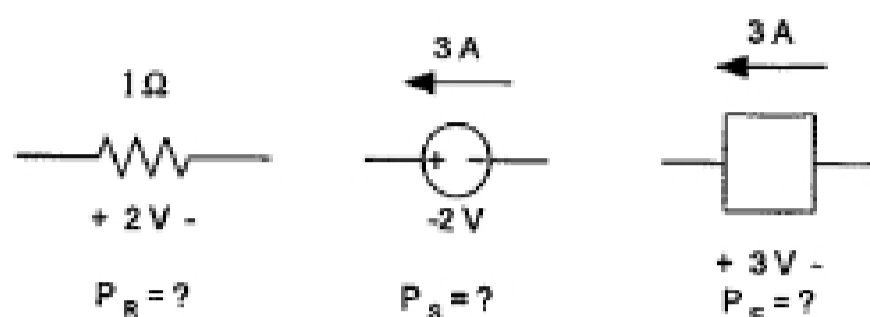
b. 45W

c. 20W

d. 5W

e. 15W

4. Find the power absorbed by the resistor (P_R), by the voltage source (P_S), and by the general circuit element (P_E) as shown in the figure below



$$P_R = \frac{(2V)^2}{1\Omega} = 4W$$

$$P_S = -IV = -(3A)(-2V)$$

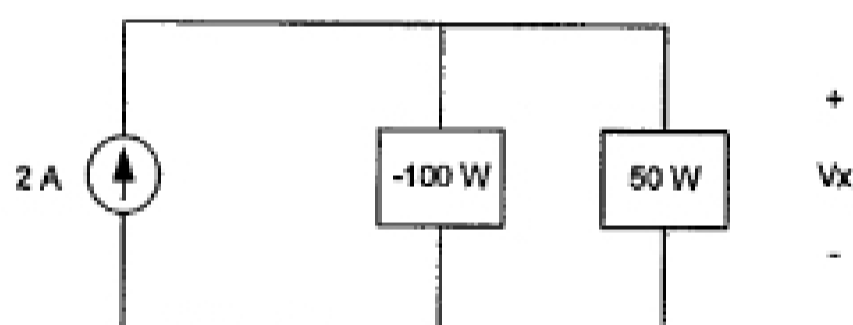
$$P_S = 6W$$

$$P_E = -IV = -(3A)(3V)$$

$$P_E = -9W$$

- a. $P_R = 2W$, $P_S = -6W$, $P_E = 9W$
 b. $P_R = 4W$, $P_S = 6W$, $P_E = -9W$
 c. $P_R = 4W$, $P_S = -6W$, $P_E = -9W$
 d. $P_R = 2W$, $P_S = -6W$, $P_E = -9W$
 e. $P_R = 4W$, $P_S = -6W$, $P_E = 9W$

5. For the circuit shown, the powers absorbed by the two general circuit elements are as indicated. Calculate the value of V_x .



a. $-25V$

b. $50V$

c. $25V$

d. $-50V$

e. $75V$

$$\sum_i P_i = 0$$

$$(-2A)(V_x) + (-100W) + 50W = 0$$

$$2V_x + 50 = 0$$

$$V_x = -25W$$