University of Arizona
Department of Electrical & Computer Engineering
ECE 220 Basic Circuits

Examination 1
February 11, 2010

Closed book/notes, calculators allowed up to level of TI89, HP48.

Part I: 8 questions
Part II: 8 questions
Part II is worth twice as much as Part I.

On the SCANTRON write and bubble-in your:

1. Name (Last, first)

2. 3 digit ID number which is given below. Write and bubble in under columns A-C under IDENTIFICATION NUMBER.

3. Write the color of your exam paper (IVORY or GREEN) on the top left margin of the SCANTRON.

Place your UA picture ID card on the adjacent desk where it can be easily seen.

When the 9:30 bell rings, begin the examination. All work should be done on the examination paper. Allow for reasonable amounts of roundoff error, and carefully mark one choice for each problem on the SCANTRON answer sheet.

All answer sheets and examinations will be collected at or before 10:30. You will be asked to stop writing and hand in your papers/answer sheets. Failure to comply promptly may result in disqualification from the exam.

NAME: _______________________________

SIGNATURE: _______________________

Remember this number:

It will be used to post your ECE 220 grades throughout the semester.
Part I.

A power reading of 26 mW can also be specified as:

a) $26 \times 10^{-6}$ W
b) $26 \times 10^{-6}$ kW
c) $26 \times 10^{-3}$ mW
d) $26 \times 10^{0}$ μW
e) none of these

2. How much energy does it take to move a toy car 100 m? Assume the car moves at 2 m/s using a 15 V battery that provides ½ A throughout the move.

a) 375 J
b) 750 J
c) 187.5 J
d) 1500 J
e) none of these

3. What statement best describes the powers in the following circuit?

a) current source delivers 8 mW, voltage source delivers 8 mW
b) current source delivers 8 mW, voltage source absorbs 8 mW
c) current source absorbs 8 mW, voltage source delivers 8 mW
d) current source absorbs 8 mW, voltage source absorbs 8 mW
e) none of these
Find \( i \):

a) 250 mA  
b) -250 mA  
c) 250 \( \mu \)A  
d) -250 \( \mu \)A  
e) none of these

All resistors shown have value 4\( \Omega \). Find the equivalent resistance as seen from terminals a and b.

a) 12 \( \Omega \)  
b) 9 \( \Omega \)  
c) 24 \( \Omega \)  
d) 10 \( \Omega \)  
e) none of these

The circuits are equivalent as seen from terminals a and b. They are also equivalent as seen from terminals c and d. Find the value of R.

a) 6  
b) 3  
c) 1  
d) 9  
e) none of these
How much power is delivered by the 1A source?

a) 2 W  
b) -2 W  
c) 4 W  
d) -4 W  
e) none of these

What is the value of $V_o$?

a) -3 V  
b) 3 V  
c) 6 V  
d) not enough information given  
e) none of the above
Part II.

q. What is the total energy delivered to the load?
   a) 5 J
   b) 10 J
   c) 15 J
   d) 20 J
   e) none of these
10. How much power is delivered by the 10 A source?

a) 100 W
b) 200 W
c) -50 W
d) 50 W
e) none of these
II. Find $V_{ab}$.
   
   a) 8 V  
   b) -8 V  
   c) -16 V  
   d) 16 V  
   e) none of these
Find total power consume by all resistors. All resistors are 2Ω.

\[ 11 \text{ V} \]

a) 165 W
b) -165 W
c) 330 W
d) -330 W
e) none of these
Find the current $i$.

a) 1 A
b) 2 A
c) 3 A
d) 4 A
e) none of these
Find $V_o$.

a) 0.5 V  
b) 1.0 V  
c) 1.5 V  
d) 2.0 V  
e) none of these
Find the shunt resistor $R_A$ needed for the ammeter below to give a full scale reading for $i = 5\text{mA}$.

a) 25 $\Omega$

b) 12.5 $\Omega$

c) 6.25 $\Omega$

d) 3.125 $\Omega$

e) none of these
Find $V_o$.

a) 1 V
b) 2 V
c) 3 V
d) 4 V
e) none of these
Answer Key – Exam 1
Spring 2010

1. B
2. A
3. C
4. D
5. B
6. D
7. A
8. A
9. C
10. D
11. C
12. A
13. D
14. B
15. C
16. B