Color: Ivory

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

Examination 1
February 13, 2014

Closed book/notes, calculators allowed up to level of TI89, TI Inspire, or HP50.

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

Show your UA picture ID card when you turn in your exam.

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 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: ______________________
Part I.

1. The “p” in pΩ means:
   a) $10^{-18}$
   b) $10^{-15}$
   c) $10^{-12}$
   d) $10^{-9}$
   e) none of these

2. Find $i$.
   a) $-4 \, \text{A}$
   b) $4 \, \text{A}$
   c) $-2 \, \text{A}$
   d) $2$
   e) none of these

3. Find the power absorbed by the current source.
   a) $-27 \, \text{W}$
   b) $9 \, \text{W}$
   c) $-3 \, \text{W}$
   d) $1 \, \text{W}$
   e) none of these

4. Find the equivalent resistance $R_{ab}$.
   a) $1 \, \Omega$
   b) $2 \, \Omega$
   c) $3 \, \Omega$
   d) $4 \, \Omega$
   e) none of these
5. The total energy absorbed by a circuit component up until time $t$ is $w(t) = e^{-2t}$ J. Find the power being delivered by the component at time $t = 0$.

a) 1 W  
b) $-1$ W  
c) 2 W  
d) $-2$ W  
e) none of these

6. Find $\nu$.

a) 2 $\mu$V  
b) $-2$ $\mu$V  
c) 4 $\mu$V  
d) $-4$ $\mu$V  
e) none of these

7. Find $\nu$.

a) 1 V  
b) $-2$ V  
c) 3 V  
d) $-4$ V  
e) none of these

8. Find $\nu$.

a) $-1.2$ V  
b) 1.5 V  
c) $-1.6$ V  
d) 1.8 V  
e) none of these
Part II.

9. Given that \( v(t) = 4 \text{ V} \) and \( i(t) = 2t \text{ A} \), find the energy absorbed by the load between time \( t = 0 \) and time \( t = 3 \).

a) \(-9 \text{ J}\)
b) \(18 \text{ J}\)
c) \(-36 \text{ J}\)
d) \(72 \text{ J}\)
e) none of these
10. Find the power delivered by the dependent source.

a) $-20 \text{ W}$
b) $20 \text{ W}$
c) $-40 \text{ W}$
d) $40 \text{ W}$
e) none of these
11. In the following circuit, \( R \neq 0 \). Is the circuit valid?

a) Yes  
b) No  
c) Depends on \( R \)  
d) Not enough information is given  
e) None of these
12. Find the equivalent resistance between \( a \) and \( b \).

a) 3 \( \Omega \)
b) 4.5 \( \Omega \)
c) 6 \( \Omega \)
d) 9 \( \Omega \)
e) none of these
13. Find $\nu$. 

a) $2 \text{ V}$ 
b) $-3 \text{ V}$ 
c) $4 \text{ V}$ 
d) $-5 \text{ V}$ 
e) none of these
14. Find $R$ so that $v = 0$.

a) 14 Ω  
b) 20 Ω  
c) 26 Ω  
d) 28 Ω  
e) None of these
15. Find $i$.

a) $1.8 \ mA$

b) $2.4 \ mA$

c) $3.0 \ mA$

d) $3.6 \ mA$

e) none of these
16. Find \( i \).

a) 6.0 A  
b) 4.5 A  
c) 3.0 A  
d) 1.5 A  
e) none of these
Answers:

1) c
2) b
3) a
4) a
5) c
6) d
7) b
8) a
9) c
10) d
11) a
12) b
13) b
14) d
15) b
16) c