



DEPARTMENT: Electrical & Computer Engineering

DATE & TIME: 30<sup>th</sup> October 2009 at 1800

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PAGE NO.: 1 of 1

COURSE: ENG 1450—Intro. Elect. & Comp. Eng.

EXAMINATION: Mid-term (20%)

DURATION: 1 Hour

EXAMINERS: C. Shafai/B. Kordi

INSTRUCTIONS:

- Do not remove the staple.
- Closed-book exam. No books/notes allowed.
- Calculators are NOT allowed.
- Attempt ALL questions.
- Return both this booklet and the bubble sheet at the end of the examination.
- This is a multiple choice examination and consists of 15 questions.
- Mark your answer in pencil on the bubble sheet provided.
- No marks will be given for working on this booklet.
- Each correct answer has one mark and each wrong answer has zero marks.
- No negative marks for wrong answer.

STUDENT NUMBER

PRINT YOUR NAME IN FULL ON THIS LINE

SIGNATURE

A01 (Prof. Shafai)    A02 (Prof. Kordi)

CIRCLE YOUR SECTION

E2-105    E2-110    E3-270

CIRCLE YOUR EXAMINATION ROOM

(n/a)

SEAT NUMBER

Mark	
Out of	15



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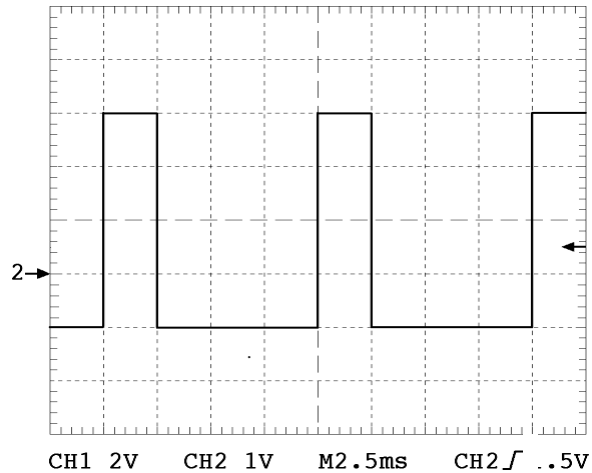
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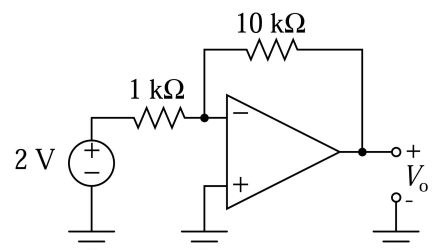
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The following figure shows the display of an oscilloscope. Questions 1 and 2 are related to this figure.



- 1 What is the frequency of the waveform displayed?
- a) 250 Hz
  - b) 100 Hz
  - c) 80 Hz
  - d) 40 Hz
  - e) None of the above.
- 2 The minimum and maximum values of the waveform are...
- a) -1 and 3 volts.
  - b) 0 and 8 volts.
  - c) 0 and 4 volts.
  - d) -2 and 6 volts.
  - e) -2 and 2 volts.
- 3 A 9-V battery supplies 1 mA to a circuit for 2 hours. How much energy is delivered to the circuit?
- a) 9 mJ
  - b) 18 J
  - c) 18 mJ
  - d) 6.48 J
  - e) 64,800 mJ
- 4 For the amplifier circuit shown, the op-amp is connected to +15 V and -15 V power supply rails. What is the measured value of  $V_o$ ?
- a) + 15 V
  - b) - 15 V
  - c) + 20V
  - d) - 20 V
  - e) - 5 V





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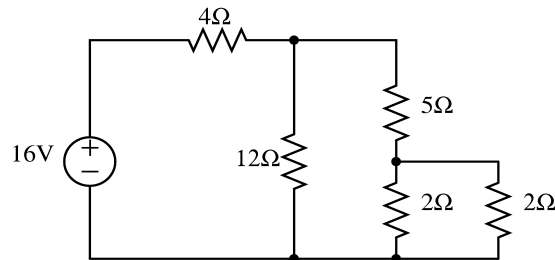
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Questions 5 - 7 are related to the circuit shown below.



5 How much is the voltage across the 12- Ω resistor?

- a) 4 V
- b) 8 V
- c) 12 V
- d) 16 V
- e)  $16/3$  V

6 Determine the power absorbed by the 5-Ω resistor.

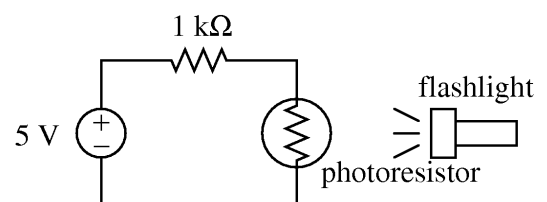
- a)  $20/3$  W
- b)  $16/5$  W
- c)  $2/3$  W
- d)  $10/3$  W
- e) None of the above

7 Determine the power delivered by the voltage source.

- a) 2 W
- b) 4 W
- c) 8 W
- d) 16 W
- e) 32 W

8 A photoresistor is used in a circuit as shown below. When the flashlight is off the voltage across the photoresistor is 4 volts and when the flashlight is on the voltage across the photoresistor drops by 1.5 volts. How much is the resistance of the photoresistor when the flash light is off and on, respectively?

- a) 1 kΩ, 2.5 kΩ
- b) 1 kΩ, 4 kΩ
- c) 4 kΩ, 1 kΩ
- d) 4 kΩ, 0 kΩ
- e) None of the above.





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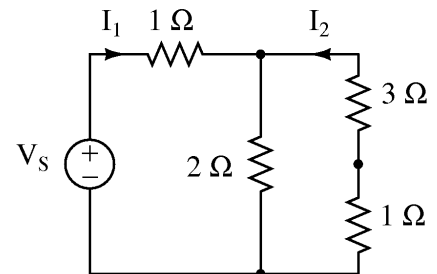
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- 9 The primary and secondary windings of a transformer have 200 and 100 turns, respectively. A 20-volt RMS sinusoidal voltage is applied to the primary of the transformer. How much is the peak of the secondary voltage?

- a) 10 V
- b) 20 V
- c)  $10/\sqrt{2}$  V
- d)  $10 \times \sqrt{2}$  V
- e)  $10 \times \sqrt{3}$  V

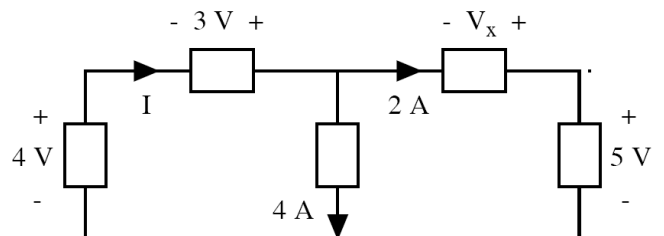
- 10 If the power dissipated in the 3-ohm resistor is 0.75 W, which of the following is correct?

- a)  $I_2 = -0.5$  A
- b)  $I_1 = 1.5$  A
- c)  $V_S = 3.5$  V
- d) All of the above
- e) None of the above



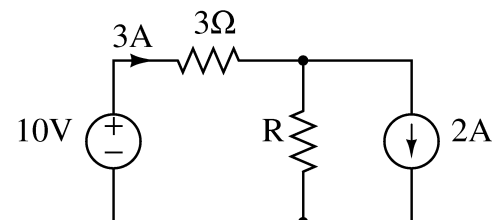
- 11 What are  $V_x$  and  $I$  in the following circuit?

- a) 2 V and 2 A
- b) 2 V and 6 A
- c) -2 V and 2 A
- d) -2 V and -2 A
- e) None of the above



- 12 What is  $R$  in the following circuit?

- a) 7 ohms
- b) 4 ohms
- c)  $7/3$  ohms
- d) 1 ohm
- e) Not enough information is given



- 13 How much energy is stored in a 10-pF capacitor when a voltage of 10 volts is applied to it?

- a) 1 nJ
- b) 0.5 mJ
- c) 0.5  $\mu$ J
- d) 0.5 nJ
- e) 0.5 pJ



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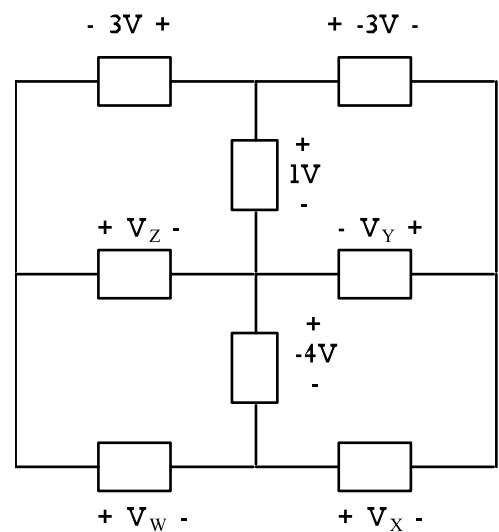
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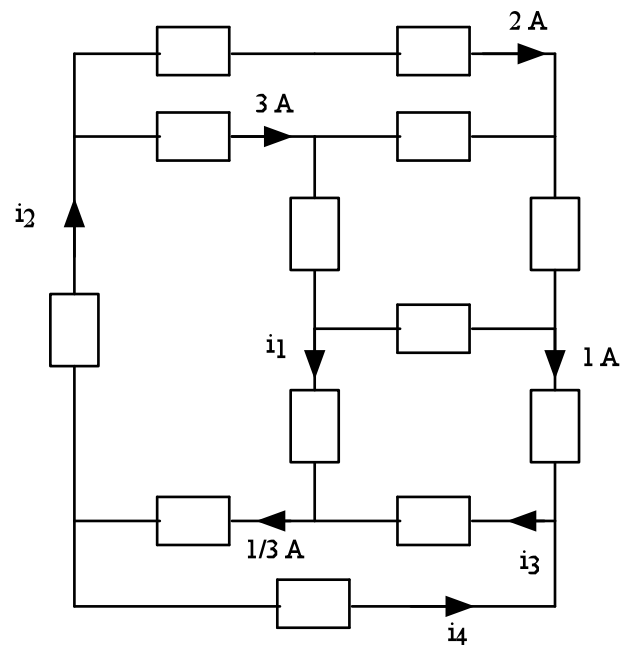
14 Using KVL, determine the voltage  $V_w$  in the following circuit.

- a) -2 V
- b) 1.5 V
- c) 4 V
- d) 2 V
- e) none of the above.



15 Using KCL, determine the current  $i_1$  in the following circuit.

- a) 6 A
- b) 4 A
- c) -2 A
- d) 8 A
- e) none of the above



# ENG1450 Mid-term Exam Answer Key

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Problem	Correct Answer
1	b
2	a
3	e
4	b
5	b
6	e
7	e
8	c
9	d
10	d
11	e
12	d
13	d
14	e
15	b