

**ECE 2100 Circuit Analysis**  
**Spring 2018**  
**Exam #1**

**NAME:** \_\_\_\_\_

**INSTRUCTIONS:**

1. **THIS EXAM IS CLOSED BOOK AND CLOSED NOTES.**
2. **NO ELECTRONIC DEVICES ARE ALLOWED.**  
All electronic devices, including watches, must be stowed away.
3. You may only use the provided pencil.  
All other writing instruments and erasers must be stowed away.
4. No hats or hoods may be worn during the exam.
5. Work each problem in the provided space.
6. Show ALL work required to arrive at a solution for either full or partial credit.
7. READ the entire question before answering.
8. Have your student ID on your desktop for inspection by the instructor.
9. SIGN the honesty pledge at the bottom of the page. Exams without a signature will receive no credit.

**I have neither given nor received assistance from anyone in regards to completion of this exam. I have followed the instructions as provided on this sheet. I HAVE VERIFIED THAT THIS EXAM HAS (7) PAGES.**

**SIGNATURE:** \_\_\_\_\_ **DATE:** \_\_\_\_\_

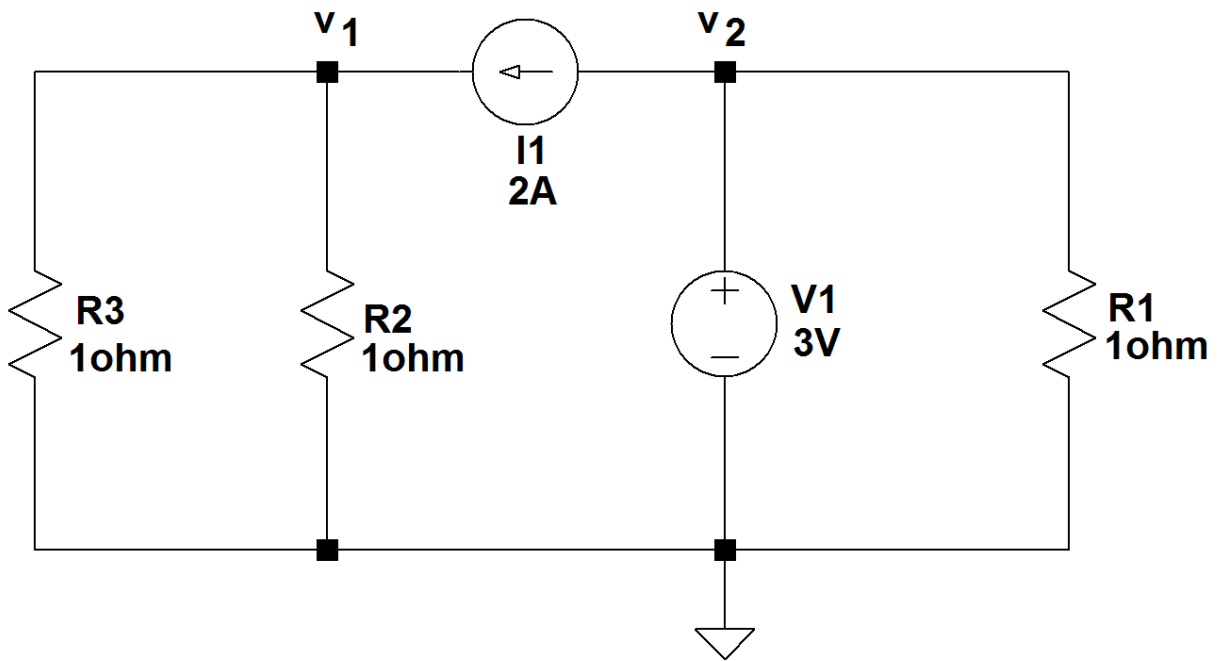
Maximum exam score is 30 points.

1. (3 points) What is the ideal input resistance of an ammeter? Justify your response using a Thevenin equivalent circuit.

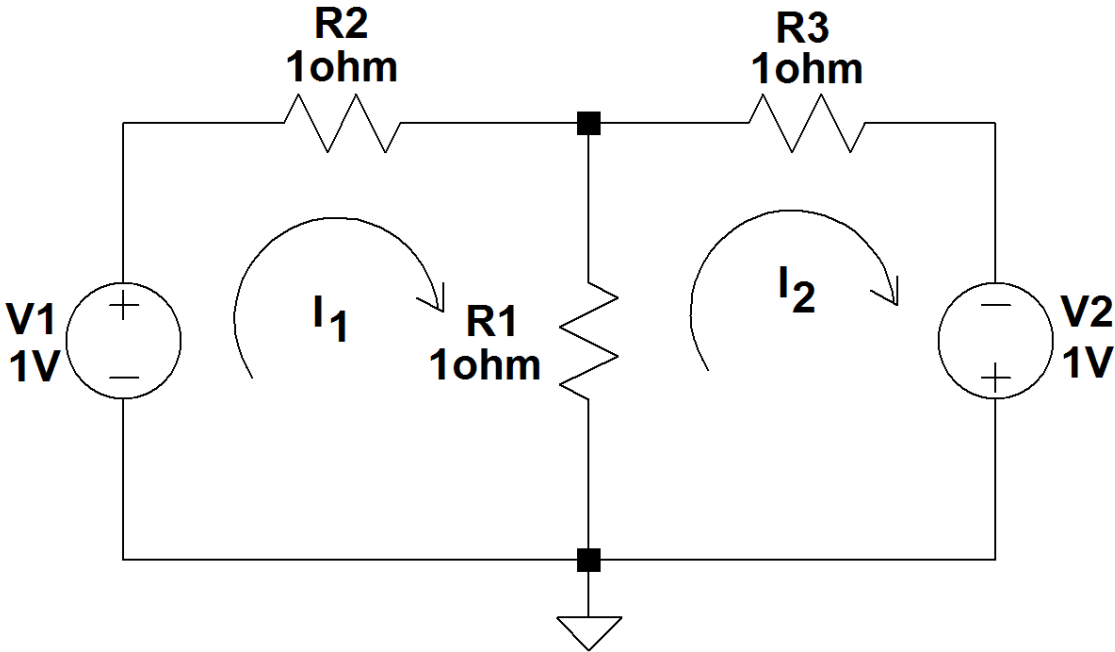
2. (2 points) Consider the system  $y = e^x$  where  $x$  is the system input,  $y$  is the system output, and  $e=2.71828...$  Is this a linear system?  
**Justify your response.**

3. (5 points) A meter movement has a series resistance of  $10\Omega$  and a full scale current of  $1\text{mA}$ . Use this meter movement to design a  $1\text{A}$  full scale ammeter. Be sure to show a schematic of your design.

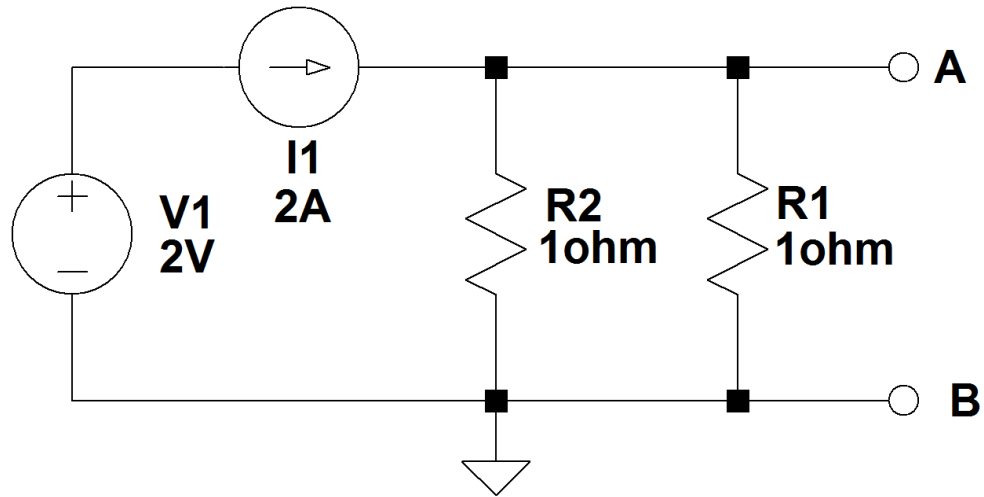
4. (5 points) Find node voltages  $v_1$  and  $v_2$  using nodal analysis.



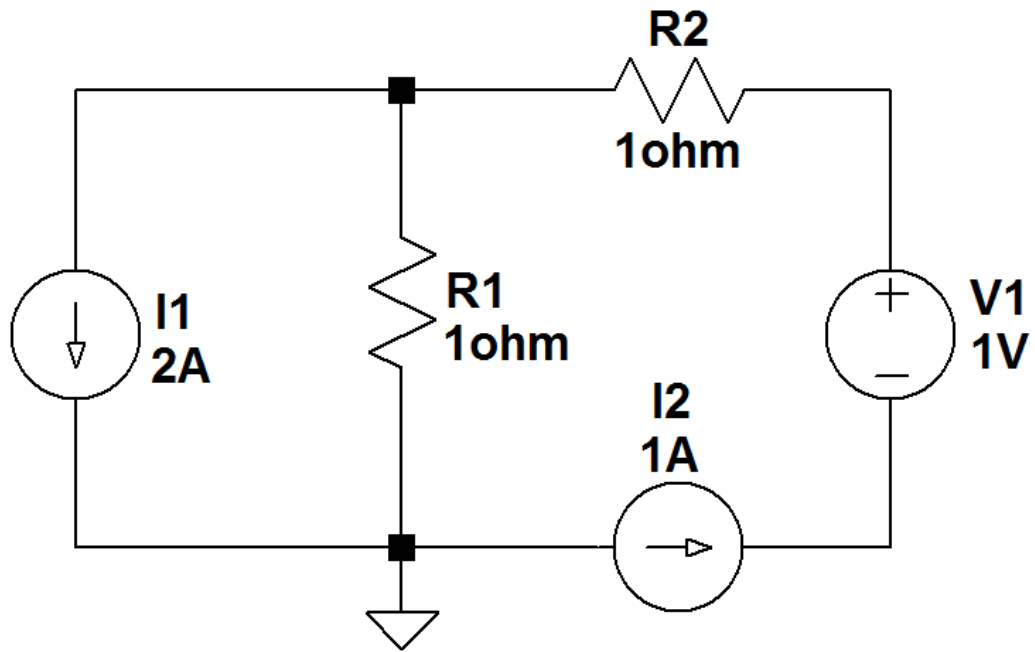
5. (5 points) Find mesh currents  $I_1$  and  $I_2$  using mesh analysis.



6. (5 points) Thevenize the following circuit “looking into” terminals A-B. Be sure to sketch the Thevenin equivalent circuit.



7. (5 points) Find the power of each circuit element. **Be sure to show all work.** Answers without supporting work will receive no credit. Put answers in table.



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ELEMENT	POWER
I1	
I2	
V1	
R1	
R2	