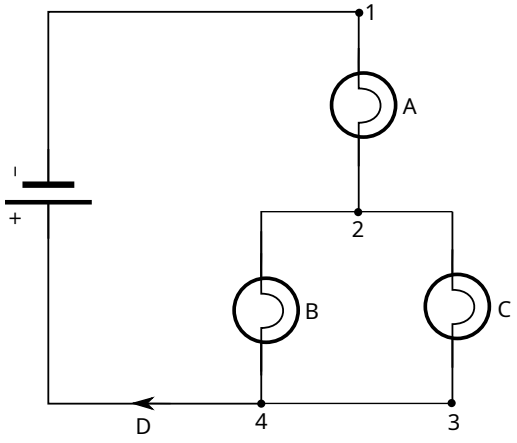
Physics 106 Midterm Practice Exam questions

- **open book**: prelabs, worksheets, homeworks, non-programmable calculator are allowed.
- **questions** are of equal value; “choose all” questions are graded like set of yes/no questions.
- **time**: 80 minutes

1. You drop a bowling ball into a deep pond. While sinking, it slows down more and more until it stops at a depth of 0.5 meter and then stays completely motionless at this depth. What can you say about the physical properties of the bowling ball and why can you make that statement?

2. Look a the circuit diagram on the right. Assume that all light bulbs are of the same make and model. Which of the following statements are true? (**choose all that apply**)



   (a) The current through bulb A is the same as the current through bulb B.

   (b) The voltage between points 2 and 4 is the same as the voltage between points 2 and 3.

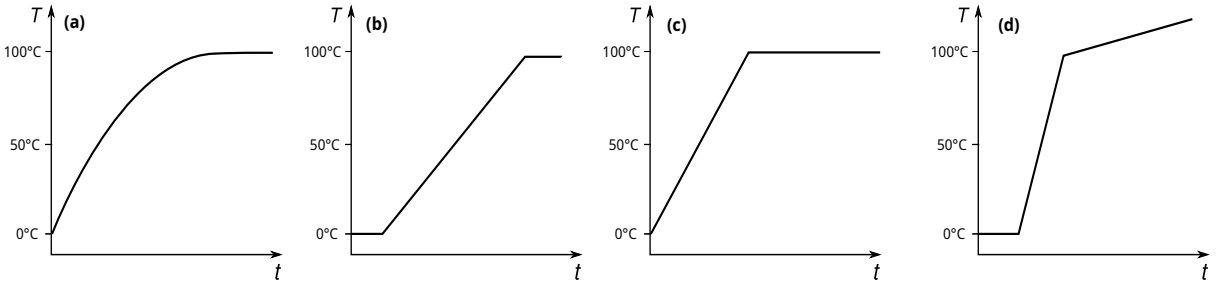
   (c) The current through bulb A is the same as the current through point D.

   (d) The current through point D is the sum of the current through bulbs A, B, and C.

   (e) The voltage between points 1 and 4 is the same as the voltage between points 1 and 2 **plus** the voltage between points 2 and 3.

3. You put a mixture of ice and water on a stove and measure temperature of the water as time goes on.

   (a) Assuming that the stove has a constant heating power, how does the curve temperature over time look like? (**choose one**)



   (b) Follow-up question: in the diagram you chose, identify which physical processes go on in which part of the diagram.

4. You build a capacitor from tinfoil, with one sheet of paper in between. Which of the following strategies **increases** the capacitance? (**choose all that apply**)

   (a) Using larger sheets of paper and tinfoil

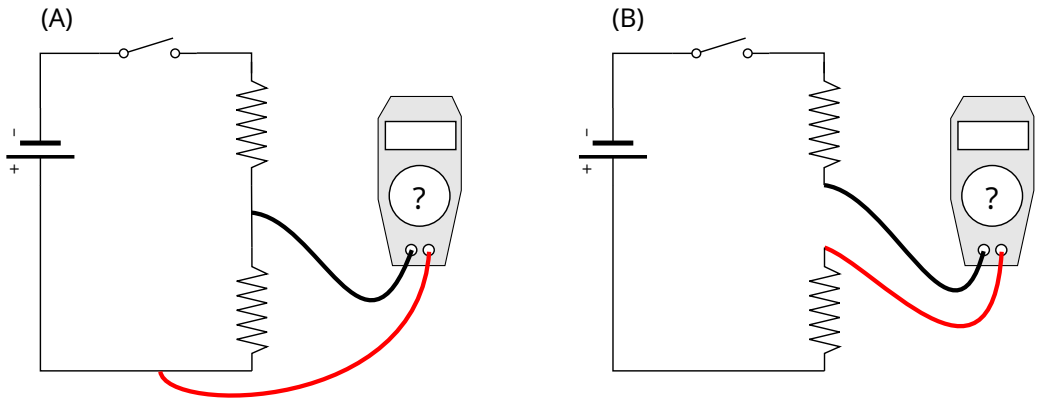
   (b) Bringing the two sheets of tinfoil in contact with each other

   (c) Using a larger voltage to charge the capacitor

   (d) Using three sheets of paper instead of one in between the tinfoil

   (e) Sandwitching the capacitor between two additional sheets of paper

5. A meter set up in the two configurations is shown. Which statement is **true**? (**choose one**)



(a) A could measure current and B could measure voltage

(b) A and B could both measure voltage

(c) A and B could both measure current

(d) A could measure voltage and B could measure current

(e) You will potentially damage the multimeter if you try to measure current in B

6. Explain the **spring constant** in your own words.