

Exam 2 – white version
Physics 2760
SP 2013

Last Name _____

First Name _____

ID # _____ Lab Section # _____

Key

This is a closed book exam. I understand, pursuant to University Regulations on academic honesty, that I am not to use any notes or information other than what is in the official, non-annotated formula sheet.

Signature _____

For multiple choice questions, please make sure that you circle the letter for the answer which you believe to be correct and only that answer. If more than one answer is circled for the same problem, you will not receive credit for it. Don't get hung up on questions. They should take only one or two minutes each. If you find yourself spending more than a few minutes on a multiple choice question you are probably looking at it the wrong way. You should skip it for now and come back to it later.

For full credit show your work for solutions to questions that require calculations. Explain from where you start to solve the problem and show your math flowing from it for full credit. **No shown work, no credit!**

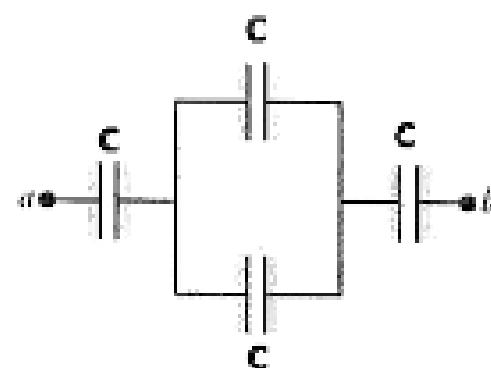
During the exam, if you have questions please raise your hand and the TA or the instructor will come to you and provide help.

The last page is the formula sheet. Feel free to tear it off. You may keep the formula sheet after the exam.

Four

1. (5 points) Three capacitors having the same capacitance "C" are connected as shown in the figure. The equivalent capacitance across terminals a and b is

- (a) $2C/3$ (b) $3C/2$ (c) $4C$ (d) $2C/5$ (e) $5C/2$



$$\frac{1}{C} + \frac{1}{2C} + \frac{1}{C} = \frac{5}{2C}$$

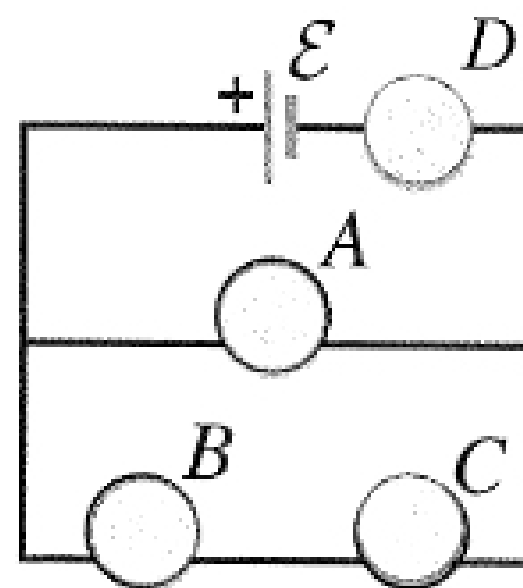
2. (5 points) A parallel plate capacitor is attached to a battery that maintains a constant potential difference V between the plates. The electric energy stored in the capacitor is U. While the battery is still connected, a glass slab is inserted so as to just fill the space between the plates. The dielectric constant K of the glass is 5. The stored energy (after the insertion of the glass) becomes

- (a) $5U$ (b) $U/5$ (c) $25U$ (d) $U/25$ (e) remains the same

$$\frac{1}{2} K C V^2 = K U = 5U$$

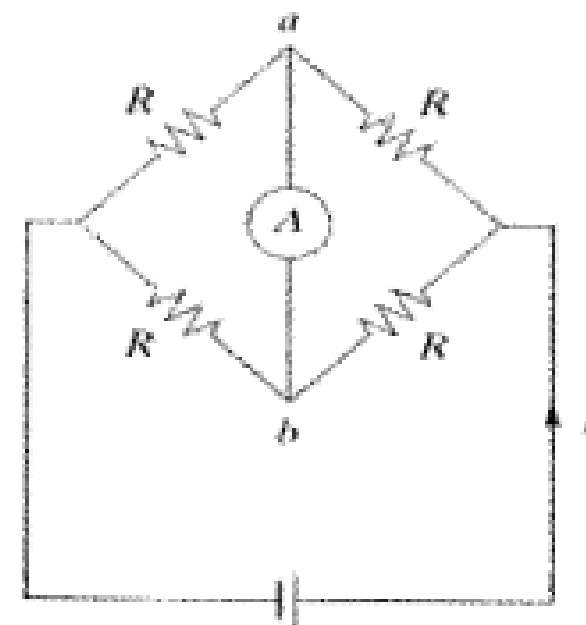
3. (5 points) Four identical light bulbs A, B, C and D are connected to a source of emf as shown. Suppose bulb A is unscrewed and removed from its socket. (The empty socket remains in the circuit.) What happens to lights bulb D?

- (a) gets brighter (b) gets darker (c) stays the same brightness



4. (5 points) An ammeter A is connected between points a and b in the circuit as shown in the figure, in which the four resistors are identical. The current through the ammeter is

- (a) zero (b) $I/2$ (c) $I/4$ (d) need more information



5. (5 points) A light bulb is connected in the circuit shown in the figure with the switch open and the capacitor uncharged. Which one of the following graphs best describes the brightness B of the bulb as a function of time t after closing the switch?

- (a) 1 (b) 2 (c) 3 (d) 4 (e) 5

