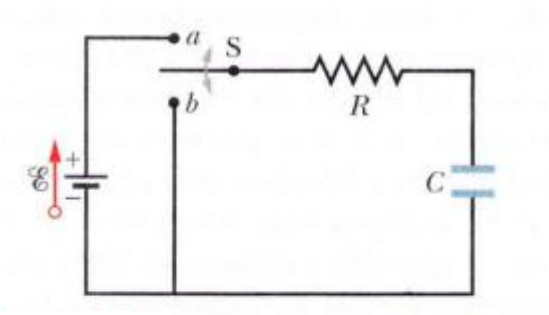
**Name _____**

**PHY2048C,Practice Final Exam**

**A- Read all the exam once, or twice, before beginning to write. Make sure to comprehend all questions and start with those you feel most confident in.**
**B – Be clear and concise. There are no extra points for being verbose or writing extra.**
**C –Only use the white pages that I will provide. You have 180 minutes to answer the exam.**

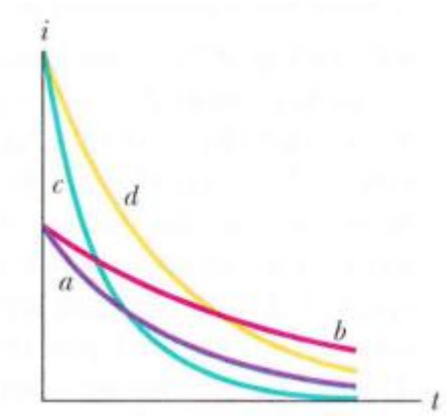
Consider this circuit




When switch S is closed on *a*, the capacitor is *charged* through the resistor. When the switch is afterward closed on *b*, the capacitor *discharges* through the resistor.

**Problem 1**

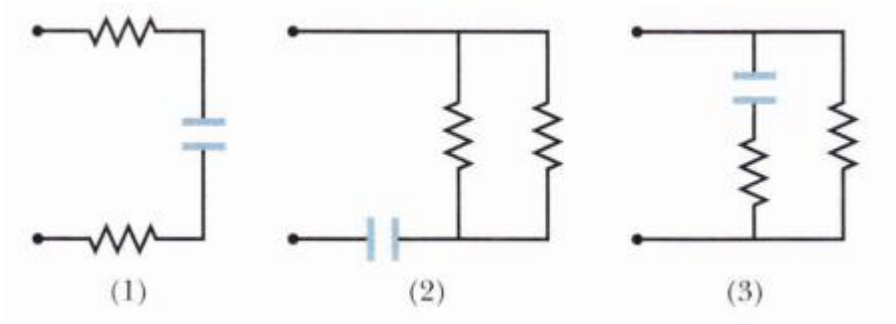
After the switch in the circuit is closed on point a,, there is current i through resistance R. The Figure below gives that current for four sets of values of R and capacitance C: (1) $R_0$ and Co, (2) $2R_0$ and Co, (3) $R_0$ and 2Co, (4) $2R_0$ and 2Co. Which set goes with which curve?




**Problem 2**

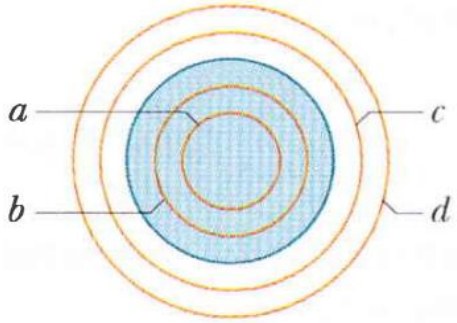
The figure below shows three sections of circuit that are to be connected in turn to the same battery via a switch as in the circuit above. The resistors are all identical, as are the capacitors. Rank the sections

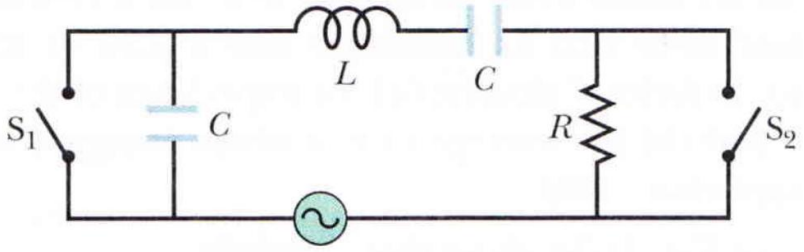
according to (u) the final (equilibrium) charge on the capacitor and (b) the time required for the capacitor to reach 50% of its final charge , greatest first.




**Problem 3**

The figure shows four circular Amperian loops (a, b, c, d) concen tric with a wire whose current is directed out of the page. The current is uniform across the wire's circular cross section (the shaded region). Rank the loops according to the magnitude of $\oint B.dl$ around each, greatest first



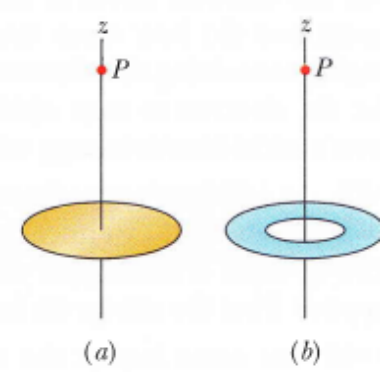




**Problem 4**

The figure above a driven RLC circuit that contains two identical capacitors and two switches. The emf amplitude is set at 12.0 V, and the driving frequency is set at 60.0 Hz. With both switches open, the current leads the emf by 30.9 degrees. With switch S1 closed and switch S2 still open, the emf leads the current by 15 degrees. With both switches closed, the current amplitude is 447 mA. What are (a) R, (b) C, and (c) L?

**Problem 5**

Consider the electric field of a disk along the central perpendicular axis of the disk, at a point P at distance 2.00R from the disk. Now consider a ring of the same outer radius R but with inner radius R/2.00. Assume that the ring will have the same surface charge density as the original disk. What is the ratio between the magnitude of the electric field between the ring and the disk?




**Problem 6** If you were to place the ring and the disk concentrically a distance P appart (the same distance that point P had from the disk). How much work will the electric field do when moving a charge from the center of the ring to the center of the disk?