

**Instructions: You have a total of 120 minutes to complete this test.
Answer each of the following questions completely.**

Your answers to this test must follow the following format in an email to me:
a f e d c d e c ... (etc) with a single space between each letter answer to the question.

Send your answers to lyonphysics@gmail.com.

The email must be time stamped before 10:05 AM May 13.

Note:

you may want to put an extra space between the answer string for each problem.

Constants:

$$e^- = -1.602 \times 10^{-19} \text{ C} , \quad k = 8.99 \times 10^9 \frac{\text{Nm}^2}{\text{C}^2} \quad \epsilon_0 = \frac{1}{4\pi k} = 8.85 \times 10^{-12} \frac{\text{C}^2}{\text{Nm}^2}$$

$$\mu_0 = 4\pi \times 10^{-7} \frac{\text{Tm}}{\text{A}} , \quad c = 3 \times 10^8 \frac{\text{m}}{\text{s}} \quad 1\mu = 1 \times 10^{-6} \quad 1\text{nm} = 1 \times 10^{-9} \text{m}$$

Due to rounding off, choose the answer which is **closest**.

This exam has 8 problems and 53 individual answers.

ou will want to make sure your submissions are

8 7 6 9 5 5 6 7 = 53

Your submission of your answers signifies your pledge to the Lyon Honor Code.

Students are instructed that they may not discuss the content of final examinations prior to the conclusion of the examination period as such discussions may involve violations of the Honor Code. You are therefore instructed not to discuss any aspect of this exam until after Monday May 17, 2021.