# EvaluAIde Beta Bonus Assignment – College Physics II: Electrostatics

**Instructions:**

- Answer all questions in detail. Show your work and reasoning for each part.
- Your submission must be a single PDF file. You may type your solutions or handwrite and scan them.
- This assignment is for bonus credit and will help improve our grading tools—thank you for participating!
- Submit your PDF via the usual course submission portal by the posted deadline.

## Questions

1. **Coulomb's Law:**
   Two point charges, $q_1 = +2.0\ \mu$C and $q_2 = -3.0\ \mu$C, are placed 0.50 m apart in vacuum.
   a) Calculate the magnitude and direction of the electrostatic force on each charge.
   b) Is the force attractive or repulsive?

2. **Electric Field of a Point Charge:**
   What is the magnitude and direction of the electric field at a point 0.30 m away from a $+5.0\ \mu$C point charge?

3. **Electric Field from Multiple Charges:**
   Two charges, $+1.0\ \mu$C and $-2.0\ \mu$C, are fixed 0.40 m apart.
   a) Find the electric field at the midpoint between them (magnitude and direction).
   b) If a $+1.0$ nC test charge is placed at the midpoint, what force does it experience (magnitude and direction)?

4. **Electric Potential (Point Charges):**

   What is the electric potential at a point 0.25 m from a $-4.0\ \mu$C point charge? (Assume zero potential at infinity.)

5. **Potential Difference and Work:**

   An electron moves from point A (potential = $+100$ V) to point B (potential = $-50$ V).

   a) What is the potential difference $V_B - V_A$?

   b) How much work is done by the electric field on the electron during this move?