

**Quiz 5: So you read the exam solutions ...**

1. If you place a negatively charged particle in an electric field, the charge will move
- from higher to lower electric potential and from lower to higher potential energy.
  - from higher to lower electric potential and from higher to lower potential energy.
  - from lower to higher electric potential and from lower to higher potential energy.
  - from lower to higher electric potential and from higher to lower potential energy.
2. A pyramid has a square base of side  $a$ , and four faces which are equilateral triangles. A charge  $Q$  is placed on the center of the base of the pyramid. What is the net flux of electric field emerging from one of the triangular faces of the pyramid?
- Uncertain: we must know whether  $Q$  is just above or below the base.
  - 0
  - $\frac{Q}{8\epsilon_0}$
  - $\frac{Qa^2}{2\epsilon_0}$
  - $\frac{Q}{2\epsilon_0}$
3. In a region of uniform electric field  $\vec{E}$ , a charged particle experiences an acceleration  $\vec{a}$ . If a second particle with **four** times the charge and **twice** the mass of the first particle enters that same region, it will experience an acceleration
- $\frac{1}{4}\vec{a}$
  - $\frac{1}{2}\vec{a}$
  - $\vec{a}$
  - $2\vec{a}$
  - $4\vec{a}$
4. A spherical balloon contains a positively charged object at its center. As the balloon is inflated to a greater volume while the charged object remains at the center, does the electric **flux** at the surface of the balloon:
- increase
  - decrease
  - remain the same
5. Two particles are separated by a distance of 3.0 m; each exerts an electric force of 1.0 N on the other. If one particle carries 10 times as much electric charge as the other, what is the magnitude of the smaller charge?
- 10 pC
  - 10  $\mu$ C
  - 10 nC
  - 10 kC