

## Module 02 Baseline Quiz

Read sections 5.4 - 5.7

1. What is a field?
  - a) A quantity that has an x, y and z component.
  - b) A quantity that has a value at every point in space.
  - c) A vector that is defined at every point in space.
  - d) None of the above.
2. What is the principle of superposition in the context of an electric field?
  - a) The principle that allows us to superimpose positive and negative charges on top of each other.
  - b) The principle that allows us to calculate the electric field from multiple charges by calculating the field from each charge separately and adding them together.
  - c) The law giving the field produced by a point charge.
  - d) None of the above.
3. What direction does the electric field produced by an electron point?
  - a) The field points away from the electron.
  - b) The field points toward the electron.
  - c) The field does not have a direction.
  - d) None of the above.
4. When drawing electric field lines, what does it mean when the lines are closer together?
  - a) It does not mean anything.
  - b) It means that the electric field is stronger in that region.
  - c) It means that the electric field is weaker in that region.
  - d) None of the above.
5. How is the direction of the electric field related to electric field lines?
  - a) The direction of the electric field at any point in space is perpendicular to the electric field lines.
  - b) The direction of the electric field is parallel (tangent) to the electric field lines.
  - c) The electric field lines are not related to the direction of the field.
  - d) None of the above.

6. What is a dipole moment?
- a) A vector describing an electric dipole, it is the product of the dipole's charge and displacement vector between the two charges.
  - b) It is the displacement vector between the two charges in an electric dipole divided by the charge.
  - c) It is the torque produced about the center of an electric dipole when placed in a uniform electric field.
  - d) None of the above.
7. What is an induced dipole?
- a) An electric dipole created when a cloud of electrons interacts with larger charged molecules.
  - b) An electric dipole created when a neutral atom is placed in an external electric field.
  - c) An electric dipole created when Faraday's induction dominates the effect of external electric fields.
  - d) None of the above.
8. How would we calculate the electric field produced by a conducting wire that has a continuous charge distributed along its length?
- a) We can treat the wire as a point charge located at its center of mass and then use the formula for the electric field produced by a point charge.
  - b) We break the wire up into segments, write down the differential field produced by each segment, and then take the derivative of the field.
  - c) We break the wire up into segments, write down the differential field produced by each segment, and then integrate over all segments.
  - d) None of the above.