Module 08 Baseline Quiz

Read sections 12.1 - 12.7

1. A long straight wire lies on the x-axis and carries a current. On the positive y-axis, the magnetic field points in the negative z direction. What direction does the current in the wire run?
   a) more information is required
   b) the current is zero
   c) negative x direction
   d) positive x direction
   e) None of the above.
2. What is the Biot-Savart Law?
   a) It gives the magnetic field produced by a long straight wire.
   b) It gives the magnetic field produced by a circular loop.
   c) It gives the magnetic field produced by an infinitesimal current loop.
   d) It gives the magnetic field produced by an infinitesimal current.
   e) None of the above.
3. The magnetic field obeys the principle of superposition. This means that the magnetic field
   a) created by multiple sources can be added together.
   b) created by multiple sources always cancel each other out.
   c) exerts a force on charged particles, but only at certain positions.
   d) None of the above.
4. A current loop sits in the $x - y$ plane, centered on the origin. At the origin, the magnetic field due to the loop points in the positive z direction. What direction does the current in the loop run when viewed from the positive z direction?
   a) clockwise
   b) counter-clockwise
   c) the current is zero
   d) more information is needed
   e) None of the above.
5. Two long conducting wires sit parallel to one another. The magnetic field at a point exactly half way between the two wires is measured to be zero. Which of the following statements could be true?

(Choose all that could be true)

a) The current through both wires is zero.

b) The current through one wire is zero, but not both.

c) The same current runs through both wires in the same direction.

d) The same current runs through both wires in opposite directions.

e) None of the above.

6. Two long conducting wires set parallel to one another. If current runs in the same direction through both wires, will the wires attract or repel each other?
   a) Neither attract nor repel.

   b) Repel.

   c) Attract.

   d) None of the above.

7. What is Ampere's Law?
   a) A relation between the magnetic field produced by a closed current loop and the total current through the loop.

   b) A relation between the magnetic force exerted on a by a closed current loop and the total current that passes through the loop.

   c) A relation between the path integral along a closed path through a magnetic field and the total current enclosed by the loop.

   d) None of the above.

8. What is a solenoid?
   a) A long straight wire.

   b) A rectangular loop of wire.

   c) A coil of wire.

   d) None of the above.

9. What is the magnetic moment of Hydrogen?
   a) $9.27 \times 10^{-24}\,\mathrm{A\,m^2}$

   b) 0

   c) $9.27\,\mathrm{A\,m^2}$

   d) None of the above.

10. What is a paramagnetic material?

a) A material that will become magnetized in the direction of an external magnetic field but will not remain magnetized after the external field is removed.

b) A material that will become magnetized in the opposite direction of an external magnetic field and remain magnetized after the external field is removed.

c) A material that will become magnetized in the opposite direction of an external magnetic field but will not remain magnetized after the external field is removed.

d) A material that will become magnetized in the direction of an external magnetic field and remain magnetized after the external field is removed.

e) None of the above.