

Physics 112
Quiz #19
November 5, 1999

Name: _____

IF YOU WANT A QUESTION GRADED OUT OF THREE POINTS (-1 [MINUS ONE] FOR WRONG ANSWER!!) WRITE "3" IN SPACE PROVIDED ON EACH QUESTION.

1. Suppose that a continuous wire runs around the four edges of this page, carrying a *clockwise* current. Circle all letters corresponding to the directions of an *external* magnetic field that would *not* cause a torque to be exerted on this loop.

A. ↑

B. ↓

C. →

D. ←

E. ⊗

F. ⊙

2. Suppose you lower a large bar magnet on top of the loop described in #1, with the *south* pole of the magnet closer to the loop (i.e., long axis [N-S axis] of the magnet perpendicular to plane of loop). What should you expect to happen:

A. Loop will be attracted toward the magnet.

B. Loop will be repelled away from the magnet.

C. Loop will be neither attracted nor repelled, but will experience a torque.

D. Loop will experience no attraction, no repulsion, and no torque.

Grade out of 3? Write "3" here: _____

3. A wire loop is sitting in a magnetic field. The field is pointing perpendicular to the plane of the loop. Which of these fields will cause the *largest* magnitude of current to flow in the loop?

A. Initial value 10 T, constant

B. Initial value 10 T, increasing at 2 T/s

C. Initial value 5 T, decreasing at 3 T/s

D. Initial value 20 T, constant

E. Initial value 40 T, increasing at 1 T/s

Grade out of 3? Write "3" here: _____

4. A uniform magnetic field points in the positive z direction; a straight wire carrying a current is sitting in this field. Rank in order the *magnitude of the force* exerted on this wire for the following five orientations of this wire:

A. along the x axis

B. along the y axis

C. along the z axis

D. in the xy plane, but not parallel to either the x or y axes

E. in the yz plane, but not parallel to either the y or z axes

Answer: (largest) _____ (smallest) [Use "=" sign if necessary]