

**Physics 112**  
**Quiz #23**  
**November 19, 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. Which of the following will have an electric field that reverses direction the *most times* each second?
  - A. blue light
  - B. a radio wave
  - C. a dental x-ray
  - D. a gamma ray
  - E. an infrared beam
  - F. a microwave antenna
  
2. A proton is moving along the x axis toward positive x. A magnetic field pointing toward positive z is switched on. The proton then:
  - A. experiences no force
  - B. experiences a force pushing it toward positive x
  - C. experiences a force pushing it toward negative x
  - D. experiences a force pushing it toward positive y
  - E. experiences a force pushing it toward negative y
  - F. experiences a force pushing it toward positive z
  - G. experiences a force pushing it toward negative z
  
3. A light ray traveling in air strikes a flat sheet of glass at a  $45^\circ$  angle. Then the angle between the *reflected* ray and the *refracted* (transmitted) ray is:
  - A.  $0^\circ$
  - B. between  $0^\circ$  and  $90^\circ$
  - C.  $90^\circ$
  - D. between  $90^\circ$  and  $180^\circ$
  - E.  $180^\circ$
  - F. cannot answer this without knowing *exact* index of refraction of the glass

***Grade out of 3? Write "3" here: \_\_\_\_\_***
  
4. A square loop of wire, 2 m on each side, is sitting in the xy plane. A 3-T magnetic field points in the z direction. The loop is then turned upside down over a period of 2 seconds. (The loop is "flipped over" so that it is still in the xy plane but the current now flows in the opposite direction.) If the resistance of the loop is 4 ohms, what is the average amount of current that flows in the loop while it is turning?
  - A. 0.75 A
  - B. 1.0 A
  - C. 1.5 A
  - D. 3.0 A
  - E. 4.5 A
  - F. 6.0 A
  - G. 9.0 A

***Grade out of 3? Write "3" here: \_\_\_\_\_***