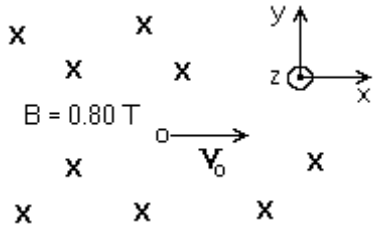
Exam

Name_____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Figure 28.2

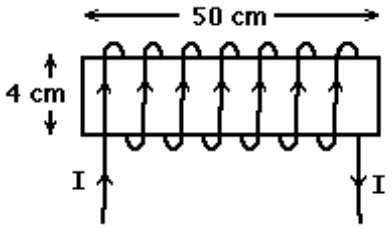


A uniform magnetic field of magnitude 0.80 T in the negative z–direction is present in a region of space. A uniform electric field is also present.

1) In Figure 28.2, an electron, projected with an initial velocity $v_o = 2.0 \times 10^4$ m/s in the positive x–direction, traverses the region without deflection. The electric field vector, in kV/m, is closest to:
   A) –16 (y–direction)
   B) –25 (y–direction)
   C) +25 (y–direction)
   D) –25 (x–diercetion)
   E) +16 (x–direction)

2) If you were to cut a small permanent bar magnet in half,
   A) each piece would contain both north and south poles, but on a given piece the intensity of the north and south poles would not necessarily be equal.
   B) one piece would be a magnetic north pole and the other piece would be a south pole.
   C) neither piece would be magnetic.
   D) each piece would in itself be a smaller bar magnet with both north and south poles.
   E) None of these statements is true.

Figure 29.7



A solenoid is wound with 400 turns on a form 4 cm in diameter and 50 cm long. The windings carry a current in the sense that is shown. The current produces a magnetic field, of magnitude 1.5 mT, at the center of the solenoid.

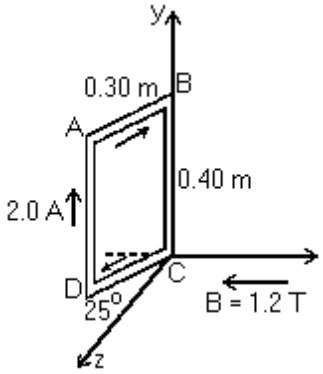
3) In Figure 29.7, the current in the solenoid windings is closest to:
   A) 1.1 A B) 1.9 A C) 1.5 A D) 1.7 A E) 1.3 A

4) An electron in a magnetic field has a cyclotron frequency of 3.0×10^{12} Hz. What is the magnetic field strength? (The mass of an electron is 9.1×10^{-31} kg, and the charge of an electron is 1.6×10^{-19} C.)
   A) 12 T B) 0.084 T C) 110 T D) 0.009,3 T

5) A tube with a 4.0–mm radius has ions flowing through it. To determine the rate at which the charge is being moved through the tube, the magnetic field just outside the tube is measured and found to be 69.0 G. (note: 1G =10^{-4}T) If the only contributor to the magnetic field is the moving ions, and if the walls of the container are very thin and do not screen magnetism, what is the magnitude of the current flowing through the tube?

A) 1734 A B) 867 A C) 276 A D) 138 A

Figure 28.7



A rigid rectangular loop, which measures 0.30 m by 0.40 m, carries a current of 2.0 A, as shown. A uniform external magnetic field of magnitude 1.2 T in the negative x–direction is present. Segment CD is in the x–z plane and forms a 25° angle with the z–axis, as shown.

6) In Figure 28.7, the y–component of the magnetic force on segment AB is closest to:

A) +0.30 N B) –0.30 N C) zero D) –0.65 N E) +0.65 N

Figure 29.5

7) In Figure 29.5, an irregular loop of wire carrying a current lies in the plane of the paper here. Suppose that now the loop is distorted into some other shape while remaining in the same plane. Point P is still within the loop. Which of the following is a true statement concerning this situation?

A) It is possible that the magnetic field at point P is zero.
B) The magnetic field at P will not change in direction when the loop is distorted.
C) The magnetic field at point P will not change in magnitude when the loop is distorted.
D) The magnetic field at point P will always lie in the plane of the paper.
E) None of these is true.

Answer Key
Testname: 1BB–QUIZ4

1) A
2) D
3) C
4) C
5) D
6) E
7) B