Exam

Name_____

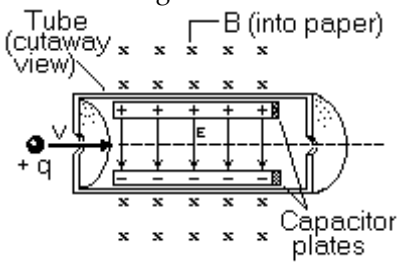
MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

1) A current flowing along the x–axis produces a magnetic field at a point on the y–axis at y=30mm that is equal to –0.40 μT (note: negative means that the field points downward into the x–y plane). The current and its sense along the x–axis are closest to:
   A) 60 mA, negative
   B) 60 mA, positive
   C) 90 mA, positive
   D) 120 mA, positive
   E) 120 mA, negative

2) A charged particle of mass 0.0090 g is subjected to a 5.0–T magnetic field which acts at a right angle to its motion. If the particle moves in a circle of radius 0.20 m at a speed of 4.0 m/s, what is the magnitude of the charge on the particle?
   A) 28 C B) 0.0018 C C) 560 C D) 0.036 C

3) Which of the following is an accurate statement?
   A) A current carrying loop of wire tends to line up with its plane parallel to an external magnetic field in which it is positioned.
   B) The magnetic force on a moving charge does not change its energy.
   C) The magnetic force on a current carrying wire is greatest when the wire is parallel to the magnetic field.
   D) A magnetic field line is, by definition, tangent to the direction of the magnetic force on a moving charge at a given point in space.
   E) Magnetic field lines have as their sources north and south poles.

Figure 28.1



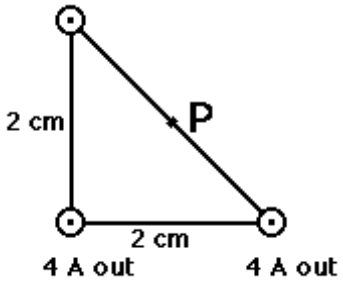
4) In Figure 28.1 is a velocity selector that can be used to measure the speed of a charged particle. A beam of particles is directed along the axis of the instrument. A parallel plate capacitor sets up an electric field E which is oriented perpendicular to a uniform magnetic field B. If the plates are separated by 4 mm and the value of the magnetic field is 0.1 T, what voltage between the plates will allow particles of speed 5×10^5 m/s to pass straight through without deflection?
   A) 4.60 V B) 146 V C) 200 V D) 2240 V E) 600 V

5) What is the magnetic field inside a solenoid with 82.0 loops that is 3.0–mm long and that has a 1.0–A current flows through it? (note $1G = 10^{-4}$ T)
   A) 246 G B) 2.2 G C) 343 G D) 3.0 G

6) A 3.0–m long wire carrying a current of 1.0 A through a magnetic field of magnitude 19.0 T experiences a force of 7.0 N entirely due to the current passing through the magnetic field. What angle does the wire make with the magnetic field?

A) 0.0021° B) 7.1° C) 14.2° D) 83°

Figure 29.9



7) Three very long, straight, parallel wires each carry currents of 4 A, directed out of the page in the drawing in Figure 29.9. The wires pass through the vertices of a right isosceles triangle of side 2 cm. What is the magnitude of the magnetic field at point P at the midpoint of the hypotenuse of the triangle?

A) 4.42×10^{-6} T B) 1.77×10^{-5} T C) 5.66×10^{-5} T D) 1.26×10^{-4} T E) 1.77×10^{-4} T

Answer Key
Testname: 1BA–QUIZ4

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