

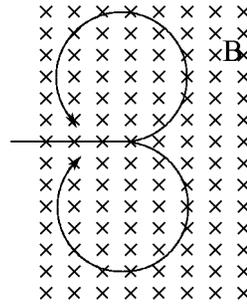
1. A 2.0 C charge with a mass of 6.0 kg is moving with a velocity of 12 m/s perpendicular to a magnetic field of 5.0 T. What is the radius of its trajectory?

- A) 0.2 m
- B) 0.8 m
- C) 1.25 m
- D) 5.0 m
- E) 7.2 m

Base your answers to questions 2 and 3 on the following situation. Several particles are projected into a uniform magnetic field with the same velocity perpendicular to the field lines.

2. The particle that would move in a circular path with the greatest radius is
- A) Proton
  - B) Electron
  - C) Positron
  - D) Alpha
  - E) Neutron
3. The particle that would continue motion in a straight line is
- A) Proton
  - B) Electron
  - C) Positron
  - D) Alpha
  - E) Neutron
- \_\_\_\_\_

4.



Two charged particles are projected into a region with a uniform magnetic field and take circular paths with the same radius, but opposite direction, as shown above. These particles are most likely

- A) an electron and a proton
  - B) an alpha particle and a beta particle
  - C) a proton and a neutron
  - D) an electron and a positron
  - E) a neutron and a neutrino
5. A 4 mA beam of electrons enters a 2 T magnetic field and moves in a circle with a radius of 3 m. The plane of this circle is perpendicular to the magnetic field. Which of the following is the most nearly the work done by the magnetic field on the particle during 5 s?
- A) 0 J
  - B)  $10^{-20}$  J
  - C)  $10^{-3}$  J
  - D)  $10^4$  J
  - E)  $10^{22}$  J
6. A beam of electrons enters a magnetic field. Which of the following best describes their motion?
- A) They continue in a straight line.
  - B) They are bent toward Magnetic North.
  - C) They exhibit circular motion in the counterclockwise direction.
  - D) They exhibit circular motion in the clockwise direction.
  - E) Not enough information is given.

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7. A particle of mass  $m$  and charge  $q$  moves with an initial velocity  $v$  perpendicular to a magnetic field  $B$ . What is the radius of the trajectory of this particle after it enters the magnetic field?

A)  $qB/mv$

B)  $mvB/q$

C)  $mv/qB$

D)  $mv^2q/B$

E)  $mv^2/qB$

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**Answer Key**  
**B Force on a Moving Charge MC Questions [Mar 28, 2011]**

1.   E
  2.   D
  3.   E
  4.   D
  5.   A
  6.   E
  7.   C
-

Name \_\_\_\_\_

Class \_\_\_\_\_

Date \_\_\_\_\_

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

4. \_\_\_\_\_

5. \_\_\_\_\_

6. \_\_\_\_\_

7. \_\_\_\_\_