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Question 1

2 / 2 points

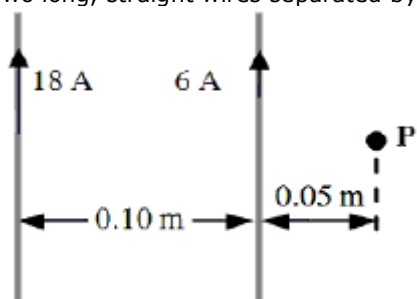
A charged particle is launched with a velocity of 5.2×10^4 m/s at an angle of 35° with respect to a 0.0045-T magnetic field. If the magnetic field exerts a force of 0.0026 N on the particle, determine the magnitude of the charge on the particle.

- a) 19 μC
- b) 15 μC
- c) 11 μC
- d) 27 μC
- e) 23 μC

Question 2

2 / 2 points

Two long, straight wires separated by 0.10 m carry currents of 18 A and 6 A in the same direction as shown.



Reference: Ref 21-6

Determine the magnitude of the magnetic field at the point **P**.

- a) 4.8×10^{-5} T
- b) 7.2×10^{-5} T
- c) 2.4×10^{-5} T
- d) 9.6×10^{-5} T
- e) zero tesla

Question 3

2 / 2 points

A proton is traveling south as it enters a region that contains a magnetic field. The proton is deflected downward toward the earth. What is the direction of the magnetic field?

- a) north
- b) downward, toward the earth
- c) west
- d) south
- e) east

2 / 2 points

Question 4

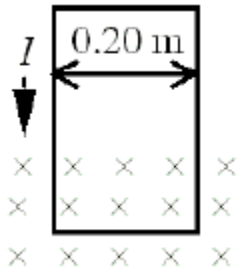
A proton traveling due west in a region that contains only a magnetic field experiences a vertically *upward* force (away from the surface of the earth). What is the direction of the magnetic field?

- a) down
- b) north
- c) east
- d) south
- e) west

Question 5

2 / 2 points

A loop of wire with a weight of 0.55 N is oriented vertically and carries a current $I = 2.25$ A. A segment of the wire passes through a magnetic field directed into the plane of the page as shown. The net force on the wire is measured using a balance and found to be zero. What is the magnitude of the magnetic field?

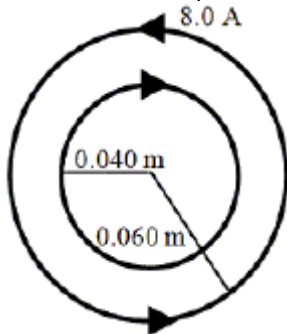


- a) 4.5 T
- b) 0.84 T
- c) 0.51 T
- d) 1.2 T
- e) zero tesla

Question 6

2 / 2 points

The figure shows two concentric metal loops, each carrying a current. The larger loop carries a current of 8.0 A and has a radius of 0.060 m. The smaller loop has a radius of 0.040 m. What is the value of a current in the smaller loop that will result in zero total magnetic field at the center of the system?

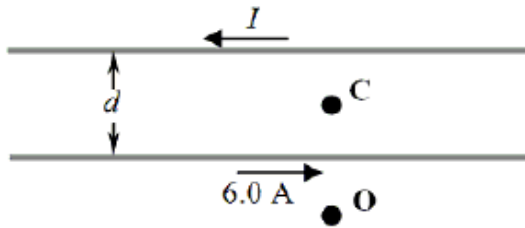


- a) 12 A
- b) 5.3 A
- c) 24 A
- d) 8.8 A
- e) 6.0 A

2 / 2 points

Question 7

Two long, straight, parallel wires separated by a distance d carry currents in opposite directions as shown in the figure. The bottom wire carries a current of 6.0 A. Point **C** is at the midpoint between the wires and point **O** is a distance $0.50d$ below the 6-A wire as suggested in the figure. The total magnetic field at point **O** is zero tesla.



Reference: Ref 21-5

Determine the value of the current, I , in the top wire.

- a) This cannot be determined since the value of d is not specified.
- b) 6 A
- c) 3 A
- d) 18 A
- e) 2 A

Question 8

2 / 2 points

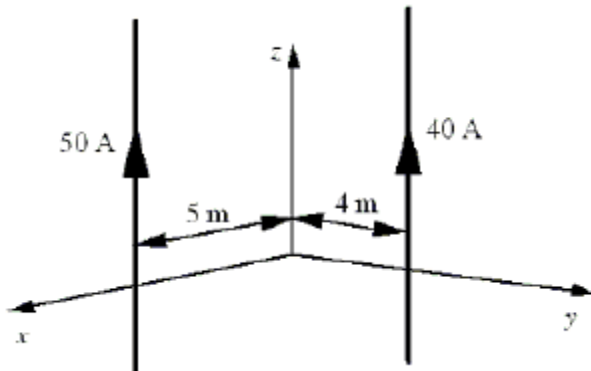
A circular coil consists of 5 loops each of diameter 1.0 m. The coil is placed in an external magnetic field of 0.5 T. When the coil carries a current of 4.0 A, a torque of magnitude 3.93 N-m acts on it. Determine the angle between the normal to the plane of the coil and the direction of the magnetic field.

- a) 30°
- b) 90°
- c) 45°
- d) 60°
- e) 0°

Question 9

1 / 2 points

The drawing shows two long, thin wires that carry currents in the positive z direction. Both wires are parallel to the z axis. The 50-A wire is in the x - z plane and is 5 m from the z axis. The 40-A wire is in the y - z plane and is 4 m from the z axis. What is the magnitude of the magnetic field at the origin?

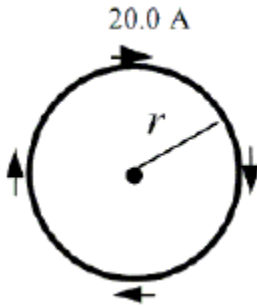


- a) 1×10^{-6} T
- b) 6×10^{-6} T
- c) 3×10^{-6} T
- d) zero tesla
- e) 4×10^{-6} T

Question 10

2 / 2 points

A wire is bent into the shape of a circle of radius $r = 0.10$ m and carries a 20.0-A current in the direction shown.



Reference: Ref 21-8

Determine the magnetic moment of the loop.

- a) $0.84 \text{ A} \cdot \text{m}^2$
- b) $1.3 \text{ A} \cdot \text{m}^2$
- c) $0.40 \text{ A} \cdot \text{m}^2$
- d) $0.20 \text{ A} \cdot \text{m}^2$
- e) $0.63 \text{ A} \cdot \text{m}^2$