

29-08

Question 851

In figure (9), a loop of wire carrying a current,  $I$ , of 3.0 A is in the shape of a right triangle with two equal sides, each 2.0 m long. A 2.0 T uniform magnetic field is in the plane of the triangle and is parallel to the hypotenuse. The resultant torque on the loop is:

- (a) 24 N\*m.
- (b) 15 N\*m.
- (c) 12 N\*m.
- (d) 3 N\*m.
- (e) 16 N\*m.

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0.44-62%

Question 852

The plane of area  $4.0 \text{ cm}^2$  rectangular loop of wire is parallel to a 2.0 T magnetic field. The loop carries a current of 6.0 A. Calculate the magnitude of the torque acts on the loop.

- (a)  $2.4 \times 10^{-3} \text{ N}\cdot\text{m}$ .
- (b)  $3.6 \times 10^{-3} \text{ N}\cdot\text{m}$ .
- (c) zero.
- (d)  $1.0 \times 10^{-3} \text{ N}\cdot\text{m}$ .
- (e)  $4.8 \times 10^{-3} \text{ N}\cdot\text{m}$ .

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0.37-23%

Question 853

A circular coil of 160 turns has a radius of 1.90 cm and carries a current  $I$ . If the maximum torque that the coil can experience in a uniform 35.0 mT magnetic field is  $0.08 \text{ N}\cdot\text{m}$ , what is the value of  $I$ .

- (a) 22.0 A.
- (b) 2.3 A.
- (c) 9.6 A.
- (d) 14.2 A.
- (e) 12.6 A.

**29-9 The Magnetic Dipole Moment**

29-09

Question 854

Which one of the following statements is WRONG?

- (a) It is impossible to isolate magnetic monopoles.
- (b) The SI units of the magnetic moment is  $\text{A}\cdot(\text{m}^2)$ .
- (c) A magnetic force acting on a moving negatively charged particle is always anti-parallel to its direction of motion.
- (d) The work done by the magnetic force on a charge moving with a speed  $v$  in a static magnetic field  $B$  is always zero.
- (e) The total magnetic force on any closed current loop in a uniform magnetic field is zero.

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Question 855

The current loop in figure (5) consists of one loop with two semicircles of different radii. If the current in the circuit is 19 A,  $a = 3.0$  cm and  $b = 5.0$  cm, then the magnetic dipole moment of the current loop is:

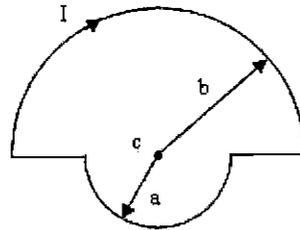


Figure 5

- (a)  $0.02 \text{ A}\cdot\text{m}^2$ , out of the page.  
 (b)  $0.10 \text{ A}\cdot\text{m}^2$ , into the page.  
 (c)  $1.15 \text{ A}\cdot\text{m}^2$ , into the page.  
 (d)  $0.10 \text{ A}\cdot\text{m}^2$ , out of the page.  
 (e)  $0.02 \text{ A}\cdot\text{m}^2$ , into the page.

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Question 856

Which of the following statements are true?

- (I) The magnetic field unit is the tesla.  
 (II) A magnetic field cannot change the kinetic energy of a charged particle.  
 (III) A charged particle moving parallel to a magnetic field will be deflected.  
 (IV) The unit of magnetic dipole moment is ampere/meter.

- (a) II, and III.  
 (b) I, and II.  
 (c) II, III, and IV.  
 (d) III, and IV.  
 (e) I, III, and IV.

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0.25-41%

Question 857

A closed loop has an area of  $5.8 \times 10^{-2} \text{ m}^2$  and carries a current of 3.0 A. It is placed in an external magnetic field, whose magnitude is 0.50 T, with its dipole moment initially making an angle of 90 degrees with the external magnetic field. How much work is done by the magnetic field as it rotates the loop from its initial orientation to the final orientation where the dipole moment is aligned with the field?

- (a) - 0.042 J  
 (b) + 0.042 J  
 (c) zero  
 (d) + 0.087 J  
 (e) - 0.087 J