29-05

Question 839 0.53-48%

An e ectron is accelerated from rest through a potential difference of 500 Volts, then injected into a uniform magnetic field. Once in the magnetic field, it complctes one revolution in 4.0 nano-s. What is the radius of the orbit?

(a) 8.4 mm
(b) 4.2 mm
(c) 13 mm
(d) 1.0 mm
(e) 16.8 mm

29-7 Magnetic force on a Current-Carrying Wire

29-07

Question 840 0.43-44%

A wire of total length 4L and carrying a current I is placed in a uniform magnetic field B that is directed out of the page as shown in Figure 6. Determine the net magnetic force on the wire.

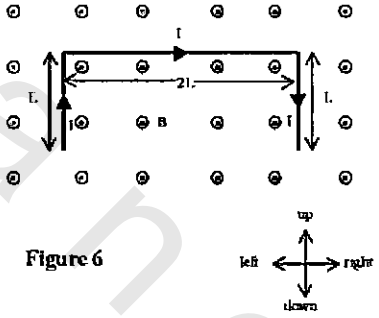

Figure 6

(a) 2ILB up
(b) 4ILB down
(c) 2ILB left
(d) 2ILB down
(e) 4ILB up

29-07

Question 841 0.29-40%

A segment of wire carries a current of 25 A. It is bent into the shape shown in Figure 4. The wire is placed in a uniform magnetic field of 40 mT and directed out of the page. Find the magnitude of the magnetic force on this segment of wire.

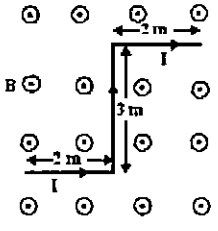

Figure 4

(a) 4.1 N
(b) 5.0 N
(c) 3.6 N
(d) 2.5 N
(e) 7.0 N

29-07

Question 842

Two infinite wires are parallel to the y-axis. One carries current i1 = 12 A in the +y-axis at x=0; the other carries i2 at x = 8.0 cm. For what magnitude and direction of i2 will the resultant magnetic field be zero at x = 6.0 cm?

(a) 4.0 A in the -y-axis.
(b) 4.0 A in the +y-axis.
(c) 6.0 A in the -y-axis.
(d) 6.0 A in the +y-axis.
(e) 2.0 A in the +y-axis.

29-07

Question 843 0.45-36%

A wire bent into a semicircle of radius R = 2.0 m forms a closed circuit and carries a current of 1.5 A. The circuit lies in the xy-plane, and a uniform magnetic field B = 3.0 T is present along the y axis, as shown in figure (6). Find the magnitude of the magnetic force on the curved portion of the wire.

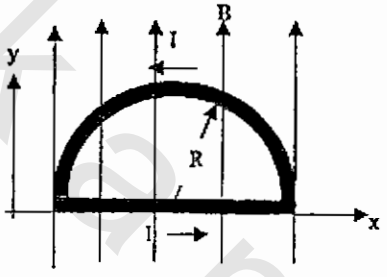

Figure (6)

(a) 6.0 N.
(b) 9.0 N.
(c) 12 N.
(d) 0 N.
(e) 18 N.

29-07

Question 844 0.56-49%

A wire 72 cm in length has a mass of 15 g. It is suspended by a pair of flexible leads in a magnetic field B = 0.54 T pointing out of the page, as shown in figure 8. What current must exist in the wire for the tension in the supporting leads to be zero ?

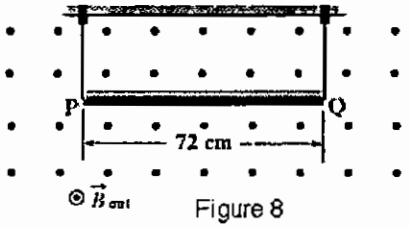

Figure 8

(a) 0.49 A from Q to P
(b) 0.38 A from P to Q
(c) 0.38 A from Q to P
(d) 0.49 A from P to Q
(e) 0.039 A from Q to P