

Question 881

30-01

0.49-45%

Figure 10 shows two concentric, circular wire loops, of radii $r_1=15$ cm and $r_2=30$ cm, are located in the xy plane. The inner loop carries a current of 8.0 A in the clockwise direction, and the outer loop carries a current of 10.0 A in the counter clockwise direction. Find the net magnetic field at the center.

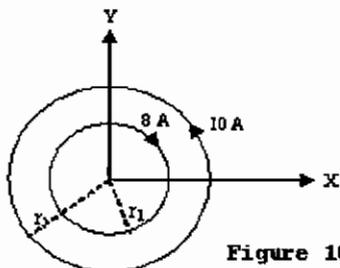


Figure 10

- (a) 12.6×10^{-6} T, directed out of the page.
 (b) zero.
 (c) 33.5×10^{-6} T, directed out of the page.
 (d) 33.5×10^{-6} T, directed into the page.
 (e) 12.6×10^{-6} T, directed into the page.

Question 882

30-01

0.15-40%

How strong is the magnetic field at a distance of 10.0 cm from a long straight wire, of radius 3.0 cm carrying a current of 5.0 A?

- (a) 1.0×10^{-5} T.
 (b) 9.0×10^{-5} T.
 (c) 2.1×10^{-7} T.
 (d) 7.1×10^{-5} T.
 (e) 3.4×10^{-5} T.

Question 883

30-01

0.15-29%

Two long parallel wires, a distance d apart, carry currents of I and $5I$ in the same direction. Locate the point r , from I , at which their magnetic fields cancel each other.

- (a) $r=d/6$.
 (b) $r=3d/2$.
 (c) $r=2d$.
 (d) $r=d/4$.
 (e) $r=d/2$.

30-2 Force Between Two Parallel Currents

Question 884

30-02

Given two parallel current-carrying wires, the force between them:

- (a) is attractive if the currents are in opposite directions.
 (b) is repulsive if the currents are in the same direction.
 (c) is attractive if the currents are in the same direction.
 (d) decreases as the distance between them decreases.
 (e) increases as the distance between them increases.

Question 885

30-02
0.49-47%

Figure 8 shows a cross section of three long parallel wires each carrying a current of 15 A. The currents in the wires A and C are out of the paper, while that in wire B is into the paper. If the distance $a = 5.0$ mm, what is the magnitude of the force per unit length on wire C?

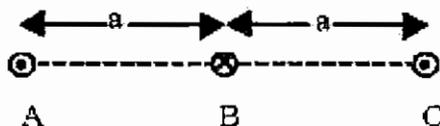


Figure 8

- (a) 5.4 milli-N/m
- (b) 3.6 milli-N/m
- (c) 9.2 milli-N/m
- (d) 2.1 milli-N/m
- (e) 4.5 milli-N/m

Question 886

30-02
0.36-47%

Two long parallel wires carrying equal currents of 10 A in opposite directions. The force per unit length of one wire on the other is 1 milli-N/m. If both currents are doubled, the force per unit length of one wire on the other will be:

- (a) 1 milli-N/m, repulsive
- (b) 4 milli-N/m, attractive
- (c) 2 milli-N/m, repulsive
- (d) 4 milli-N/m, repulsive
- (e) 2 milli-N/m, attractive

Question 887

30-02

Suppose that the identical currents I in figure (7) are all out of the page. The magnitude of the force per unit length on the wire at the origin is: [take $I = 10.0$ A, and $a = 1.0 \times 10^{-4}$ m.]

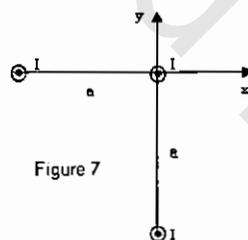


Figure 7

- (a) 0.28 N/m.
- (b) 0.18 N/m.
- (c) 0.55 N/m.
- (d) 0.17 N/m.
- (e) 0.30 N/m.

Question 888

30-02

Three parallel wires lie in the xy -plane. The separation between adjacent wires is 0.1 m, and each wire carries a 10-A current in the same direction. Find the magnitude of the net force per unit length on one of the outer wires.

- (a) 7.5×10^{-4} N.
- (b) 3.0×10^{-4} N.
- (c) 1.1×10^{-4} N.
- (d) 5.0×10^{-7} N.
- (e) 6.0×10^{-4} N.

Question 889

30-02

0.40-57%

Two parallel wires, carrying equal currents of 10 A, attract each other with a force F . If both currents are doubled, and the distance between them reduced by 50%, the new force will be:

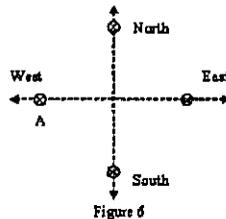
- (a) $16 * F$.
- (b) $4 * F$.
- (c) F .
- (d) $8 * F$.
- (e) $F/4$.

Question 890

30-02

0.27-68%

Four long straight wires carry equal currents into page as shown in Figure 6. The magnetic force exerted on wire A is:



- (a) East.
- (b) North.
- (c) West.
- (d) South.
- (e) Zero.

Question 891

30-02

0.35-57%

Two long parallel wires, D and B, are separated by 2.0 cm. The current in D is THREE times the current in B. If the magnitude of the force on 2.0 m length of one of the wires is equal to 60 micro-N, find the current in B.

- (a) 5.0 A.
- (b) 1.5 A.
- (c) 2.0 A.
- (d) 1.0 A.
- (e) 0.5 A.

Question 892

30-02

0.35-46%

Figure 4 shows a cross section of three parallel wires each carrying a current of 12 A. The currents in wires A and C are out of the page, while that in wire B is into the page. If the distance $R = 4.0$ mm, what is the magnitude of the magnetic force on a 3.0-m length of wire B?

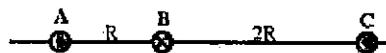


FIGURE 4

- (a) 11 mN
- (b) 51 mN
- (c) 22 mN
- (d) 17 mN
- (e) 32 mN