Name_Professor S.K. Sinha_____

$\mu 0 = 4\pi . 10^{-7}$ N/A2

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Situation 29.1

A current flows on the x-axis. A field point is on the y-axis at y = +30 mm. The magnetic field produced at the field point is equal to -0.40 k μT along the y-direction.

  1) The current and its sense along the x-axis are closest to:

    A) 60 mA, positive

    B) 90 mA, positive

    C) 120 mA, negative

    D) 120 mA, positive

    E) 60 mA, negative

Figure 29.2
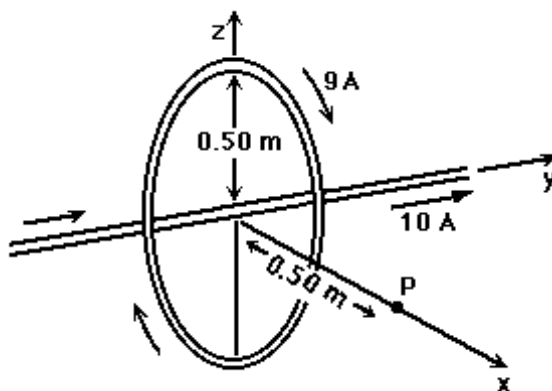
A long straight wire on the y-axis carries a 10 A current in the positive y-direction. A circular loop 0.50 m in radius, which is in the y-z plane, carries a 9 A current, as shown.

  2) In Figure 29.2, a field point P is on the positive x-axis, at a distance of 0.50 m from the center of the loop. The magnetic field at the field point P is closest to:

    A) (+4.0 x 10^{-6}T) i - (4.0 x 10^{-6}T) k

    B) zero

    C) (-4.0 x 10^{-6}T) i - (8.0 x 10^{-6}T) k

    D) (-4.0 x 10^{-6}T) i - (4.0 x 10^{-6}T) k

    E) (-8.0 x 10^{-6}T) k

Figure 29.5

3) In Figure 29.5, an irregular loop of wire carrying a current lies in the plane of the paper here. Suppose that now the loop is distorted into some other shape while remaining in the same plane. Point P is still within the loop. Which of the following is a true statement concerning this situation?

   A) The magnetic field at point P will always lie in the plane of the paper.

   B) The magnetic field at point P will not change in magnitude when the loop is distorted.

   C) The magnetic field at P will not change in direction when the loop is distorted.

   D) It is possible that the magnetic field at point P is zero.

   E) None of these is true.

Figure 29.3
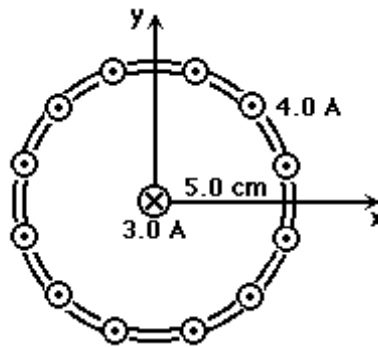
A long cylindrical shell 5.0 cm in radius is coaxial with a long thin wire. The shell carries a current of 4.0 A, uniformly distributed over the shell, and the wire carries a current of 3.0 A, as shown.

4) In Figure 29.3, a field point is on the positive x-axis, 3.0 cm from the wire. The y-component of the magnetic field at this point is closest to:

   A) +7 x 10^{-6}T   B) -47 x 10^{-6}T   C) +20 x 10^{-6}T   D) -7 x 10^{-6}T   E) -20 x 10^{-6}T