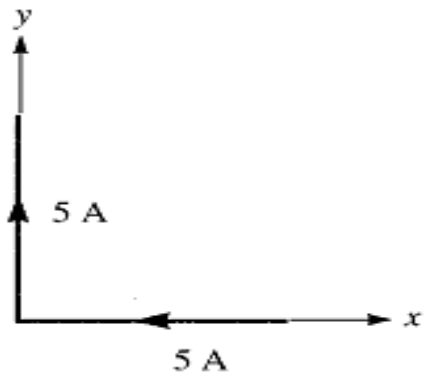
UNIVERSITY OF PETROLEUM & ENERGY STUDIES, DEHRADUN

Program	**B. Tech CS : (All Batches)**	**Semester**	**I**
Course	**ENGINEERING PHYSICS**	**Course Code**	**PHYS1023**
Session	**Sept - Dec, 2021**	**Topic**	**MAGNETOSTATICS**

(All bold notations represent vector quantities)

1. An infinitely long conductor is bent into an L shape as shown in Figure below. If a direct current of $5\ A$ flows in the conductor, find the magnetic field intensity at **(a)** $(2, 2, 0)$, **(b)** $(0, -2, 0)$, and **(c)** $(0, 0, 2)$. Take the origin at the bend.



2. In a certain conducting region, $\boldsymbol{H} = yz(x^2 + y^2)\boldsymbol{a_x} - y^2xz\boldsymbol{a_y} + 4x^2y^2\boldsymbol{a_z}$ A/m**,**
   (a) Determine $\boldsymbol{J}$ at $(5, 2, -3)$
   (b) Find the current passing through $x = -1, 0 < y, z < 2$ and

3. A conducting circular loop of radius 20 cm lies in the $z = 0$ plane in a magnetic field, $\boldsymbol{B} = 10\cos 377t\ \boldsymbol{a_z}$ mWb/m^2. Calculate the induced voltage in the loop.

4. Explain the Transformer and Motional EMF.