

Answer on Question #46223 – Physics – Electromagnetism

Question.

A magnetic field does NOT exert a force on a:

- a) paper clip
- b) magnet
- c) stationary charge
- d) moving charge

Solution.

- a) paper clip

As everybody knows, the magnets exert a force on metal.

- b) magnet

Magnets exert forces on other magnets even though they are separated by some distance. Opposite poles of a magnet attract and similar poles repel.

- c) stationary charge

The magnetic field exerts on a moving charge with the Lorentz force:

$$\vec{F} = q[\vec{v} \times \vec{B}]$$

If $\vec{v} = 0$, i.e. a charge is stationary, $\vec{F} = 0$. So, A magnetic field does not exert a force on a stationary charge.

- d) moving charge

The magnetic field exerts on a moving charge with the Lorentz force:

$$\vec{F} = q[\vec{v} \times \vec{B}]$$

Answer.

- c) stationary charge