

Answer on Question 49196, Physics, Electromagnetism 1. A magnetic field can deflect a beam of electrons, but it cannot do work on the electrons to change their speed. Why?

Solution

Magnetic field acts with Lorentz's force on charges. This force is perpendicular to the velocity of electron. Hence, it can not change the absolute value of velocity, or the speed. Hence, it can not change the kinetic energy and therefore it can not do any work.