If an electron enters in a perpendicular magnetic field than why its kinetic energy remain constant?

Answer

Magnetic force is always perpendicular to velocity, so that it does no work on the charged particle:

$$\Delta W_m = \overrightarrow{F_m} \cdot \overrightarrow{\Delta x} = \overrightarrow{F_m} \cdot (\vec{v}\Delta t) = \overrightarrow{F_m} \cdot (\vec{v}\Delta t) = \left(\overrightarrow{F_m} \cdot \vec{v}\right)\Delta t = 0,$$

because scalar product of two perpendicular vectors is 0.

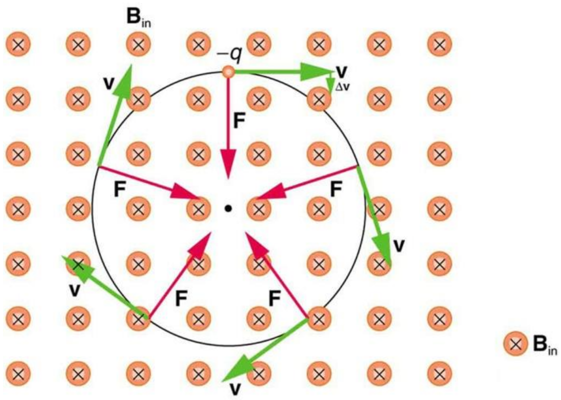
The particle's kinetic energy and speed thus remain constant:

$$\Delta K = K_f - K_{in} = W_m = 0 \rightarrow K = const.$$

The direction of motion is affected, but not the speed:

$$K = \frac{mv^2}{2} \rightarrow v = \sqrt{\frac{2K}{m}} = const.$$

A charged particle moves perpendicular to a uniform B-field, such as shown in Figure.



Here, the magnetic force supplies the centripetal force $F_c = \frac{mv^2}{r}$ and particle moves in a circle.