Q. 4 An electron is projected with uniform velocity along the axis of a current carrying long solenoid. Which of the following is true?

(a) The electron will be accelerated along the axis

(b) The electron path will be circular about the axis

(c) The electron will experience a force at 45° to the axis and hence execute a helical path

(d) The electron will continue to move with uniform velocity along the axis of the solenoid

K **Thinking Process**

Here, magnetic lorentz force comes into existence when a charge moves in uniform magnetic field produces by current carrying long solenoid.

Ans. (d) Magnetic Lorentz force electron is projected with uniform velocity along the axis of a current carrying long solenoid $F = -evB \sin180° = 0$ ($\theta = 0°$) as magnetic field and velocity are parallel. The electron will continue to move with uniform velocity along the axis of the solenoid.