

- 5 Fig. 5.1 shows a particle of charge $-5.0 \times 10^{-6} \text{ C}$ undergoing uniform circular motion horizontally clockwise direction. The motion takes place in a region with a uniform magnetic field and uniform electric field, with both fields directed downwards in the plane of the paper.

The magnetic flux density is 0.50 T and the electric field strength is 150 N C^{-1} .

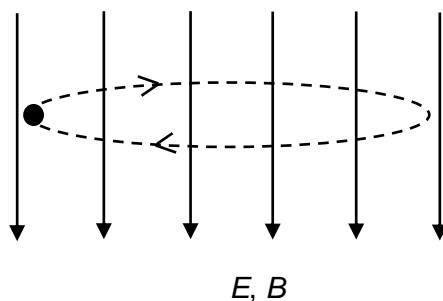


Fig. 5.1

- (a) (i) Show that the period of revolution, T , of the charged particle is given by

$$T = \frac{2\pi E}{Bg}$$

where g is the acceleration of free fall.

[3]

- (ii) Hence determine the period T .

$T = \dots\dots\dots \text{ s [1]}$

- (b)** The electric field is now removed.

Describe the motion of the charged particle. Explain your answer.

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