8 This question is about magnetic fields.

(a) Diagram 1 shows a positively charged proton moving downwards in a uniform magnetic field.

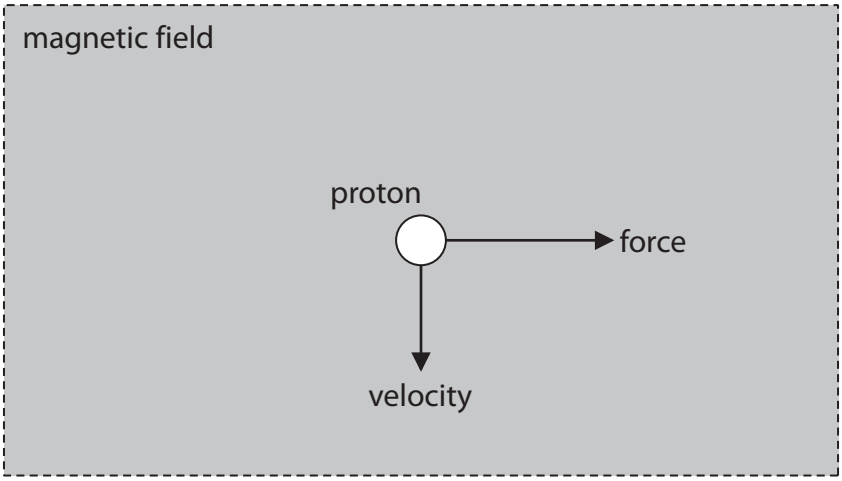

Diagram 1

The proton experiences a force to the right.

What is the direction of the magnetic field?

(1)

☒ **A** into the page

☒ **B** left

☒ **C** out of the page

☒ **D** upward

(b) When a current passes through a flat circular coil, a magnetic field is produced.

Complete diagram 2 by drawing the magnetic field of the flat circular coil.

(3)

Diagram 2

Turn over for the last part of the question

(c) A wireless charging base uses a magnetic field to charge the battery of a mobile phone.

© BeeBright/Shutterstock

There is an alternating current in a coil of wire in the charging base.

There is another coil of wire connected to the battery in the mobile phone.

(i) Explain how the wireless charging base charges the battery of the mobile phone.

(3)

(ii) Discuss the advantages and disadvantages of using a high current in the wireless charging base.

(2)

(Total for Question 8 = 9 marks)

TOTAL FOR PAPER = 70 MARKS