

- 15 A student placed two magnets on a holder so that the north pole of one magnet faced the south pole of the other magnet. The arrangement was placed on a sensitive balance, calibrated to measure force.

The student held part of a closed loop of wire between the magnets, as shown in the photograph.



- *(a) When the student moved the wire quickly downwards between the magnets, the reading on the balance changed.

Explain how the reading on the balance changed.

(6)

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- (b) A voltmeter was connected across the ends of a second wire.
The student moved this wire vertically downwards between the magnets at a constant speed.

A potential difference (p.d.) was observed on the voltmeter while the wire was moving.

Calculate the maximum p.d. that could have been measured.

length of each magnet = 34 mm

height of each magnet = 20 mm

magnetic flux density between magnets = 0.35 T

vertical speed of wire = 2.2 m s^{-1}

(5)

Maximum p.d. =

(Total for Question 15 = 11 marks)