



- 2 (a) (i) State the condition needed for a current-carrying wire in a magnetic field to experience a force.

..... [1]

- (ii) A current-carrying wire is arranged in a magnetic field so that it experiences a force.

Explain why this force is exerted.

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[2]

- (b) The magnitude and direction of both the current  $I$  and the magnetic field  $B$  are known.

- (i) State how the magnitude of the force  $F$  on a current-carrying wire of length  $L$  is calculated. Identify the meaning of any other symbols used.

..... [1]

- (ii) State and explain how the direction of the force on the current-carrying wire is determined.

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[3]





- (c) Two current-carrying wires, X and Y, are placed near to each other. The currents in both wires are directed out of the page.

State and explain the direction of the force on wire Y.

Draw on Fig. 2.1 as part of your answer.



Fig. 2.1

[3]

[Total: 10]

