

- 5 (a) State Faraday's law of electromagnetic induction.

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.....

[1]

- (b) A solenoid S is wound on a soft-iron core, as shown in Fig. 5.1

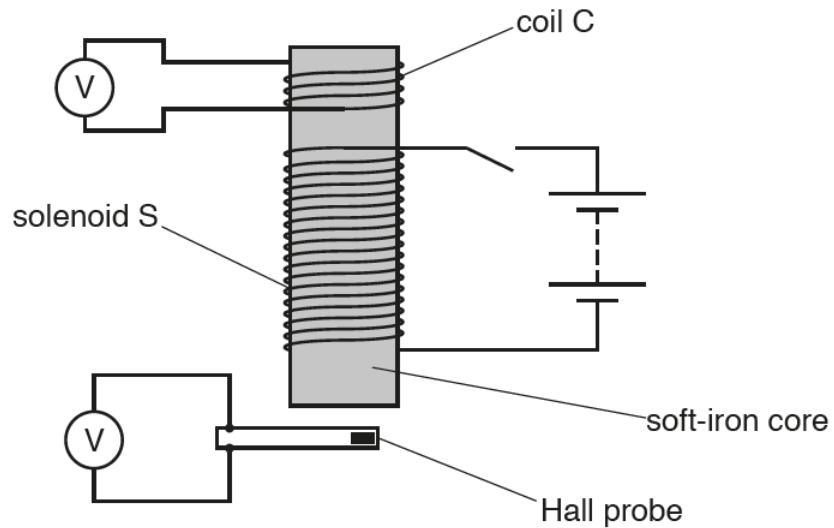


Fig. 5.1

A coil C having 120 turns of wire is wound to one end of the core. The area of cross-section of coil C is  $1.5 \text{ cm}^2$ .

A Hall probe is placed close to the other end of the core.

When there is a constant current in solenoid S, the flux density in the core is 0.19 T. The reading on the voltmeter connected to the Hall probe is -0.20 V.

The current in solenoid S is now reversed in a time of 0.13 s at a constant rate.

- (i) Calculate the reading on the voltmeter connected to coil C during the time that the current is changing.

reading = ..... V [2]

- (ii) Complete Fig. 5.2 for the voltmeter readings for the time before, during and after the direction of the current is reversed.

	before current changes	during current change when current is zero	after current changes
reading on voltmeter connected to coil C/ V	.....	.....	.....
reading on voltmeter connected to Hall probe/ V	-0.20	.....	.....

**Fig. 5.2**

[4]

[Total: 7]

