10 (a) (i) Define *magnetic flux*.

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.....

.....[2]

(ii) State Faraday's law of electromagnetic induction.

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.....[2]

(b) A solenoid has a coil C of wire wound tightly about its centre, as shown in Fig. 10.1.

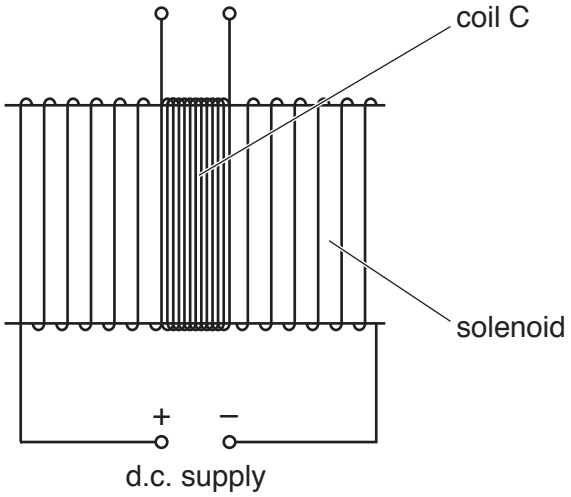

Fig. 10.1

The coil C has 96 turns.

The uniform magnetic flux Φ (in weber) in the solenoid is given by the expression

$$\Phi = 6.8 \times 10^{-6} \times I$$

where I is the current (in amperes) in the solenoid.

Calculate the average electromotive force (e.m.f.) induced in coil C when a current of 3.5 A is reversed in the solenoid in a time of 2.4 ms.

e.m.f. = ... V [2]

(c) The d.c. supply in Fig. 10.1 is now replaced with a sinusoidal alternating supply.

Describe qualitatively the e.m.f. that is now induced in coil C.

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.....[2]

[Total: 8]

[Turn over