6 **(a)** State Faraday's law of electromagnetic induction.

……

……

…… [2]

(b) An iron-core transformer is illustrated in Fig. 6.1.

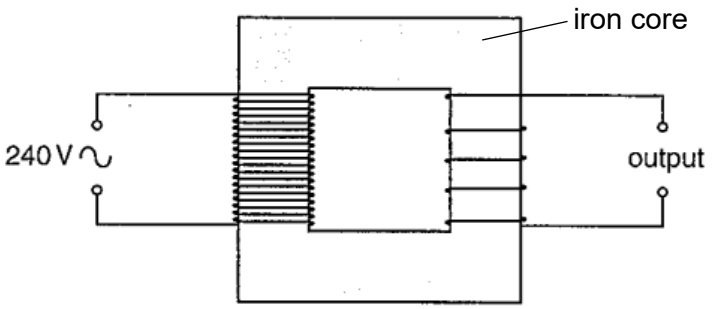

Fig. 6.1

The input potential difference is 240 V r.m.s. The **maximum** output potential difference is 24 V. There are 260 turns of wire on the secondary coil.

(i) Explain what is meant by an ideal transformer.

……

…… [1]

(ii) Calculate the number of turns of wire on the primary coil.

number of turns = …… [3]

(iii) There is power loss in the transformer.

If the input rms current is 350 mA and the output rms current is 3.5 A, calculate the efficiency of this transformer.

efficiency = ... % [2]

(iv) Suggest and explain one way to reduce the power loss of the transformer.

.....

.....

.....

..... [2]

[Total: 10]