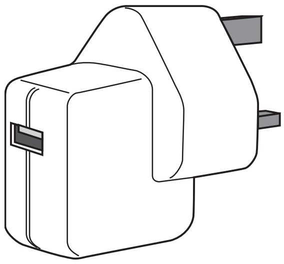
3 The diagram shows a USB power adapter which plugs into a 230 V a.c. mains socket.



The adapter contains a small step-down transformer.

3 (a) The core of the transformer is made of laminated soft iron.

Why is iron used?

....

....

(1 mark)

3 (b) The coils of the transformers are made of insulated copper wire.

Why is the wire insulated?

....

....

(1 mark)

Do not write outside the box

3 (c) There are 500 turns on one coil of the transformer and 20 000 turns on the other coil.

Use the equation in the box to calculate the p.d. across the secondary coil.

$$\frac{\text{p.d. across primary}}{\text{p.d. across secondary}} = \frac{\text{number of turns on primary}}{\text{number of turns on secondary}}$$

Show clearly how you work out your answer and give the unit.

....

....

....

p.d. across the secondary = ...

(3 marks)

5

Turn over for the next question