4

A hair dryer sold in Singapore is rated at 240 V r.m.s., 1000 W. An exchange programme student plans to bring the blower to the United States of America (USA), where the voltage is 120 V r.m.s.

(a)

Explain why the current from the mains is alternating current rather than direct current.

[2]

(b)

Explain what is meant by the *root mean square* (r.m.s.) *value* of the current.

[2]

(c)

It was suggested that the student bring along a transformer to USA in order to operate the blower.

Determine a suitable transformer's turns ratio $\frac{N_s}{N_p}$.

$\frac{N_s}{N_p} =$

[1]

(d)

Determine the peak current which the transformer will draw from the USA outlet when the blower is operating at 1000 W. State any assumption you have made in your working.

peak current =

A

[3]