6 **(a)** The equation $V = 340 \sin(100\pi t)$ represents a sinusoidal alternating voltage for a household power supply, where V is in volts and t is in seconds. State the frequency, peak voltage and root-mean-square voltage for this alternating voltage.

(i)

frequency = ... Hz [1]

(ii)

peak voltage = ... V [1]

(iii)

root-mean-square voltage = ... V [1]

(b) Fig. 6 shows an ideal iron-cored transformer. The ratio of the secondary turns to the primary turns is 1:20.

A 240 V a.c. supply is connected to the primary coil and a 6.0 Ω resistor is connected to the secondary coil.

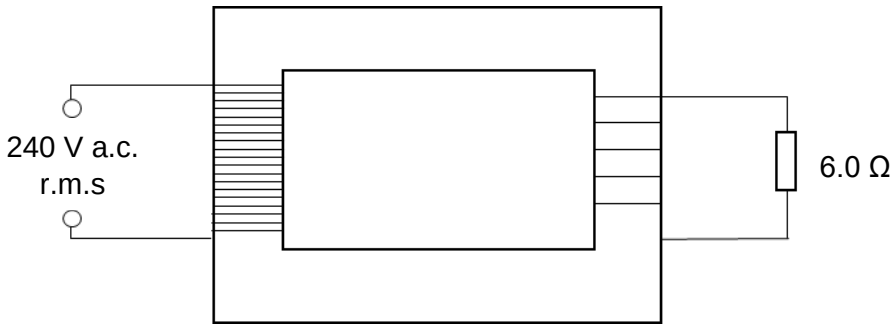

Fig. 6

(i) Determine the voltage across the 6.0 Ω resistor.

voltage = ... V [1]

(ii) Calculate the current in the primary coil.

current = …… A [3]

[Total: 7]