5 Fig. 5.1 shows an ideal transformer, where the primary coil is connected to an alternating voltage supply of 20 V. The secondary coil is connected to an ideal ammeter and a fixed resistor R of resistance 50 Ω. The number of turns in the primary coil N_P is 25.

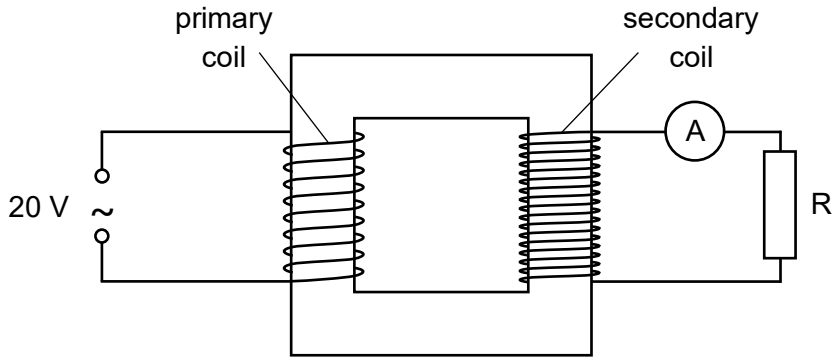

Fig. 5.1

Fig. 5.2 shows the variation with time *t* of the current I recorded from the ammeter.

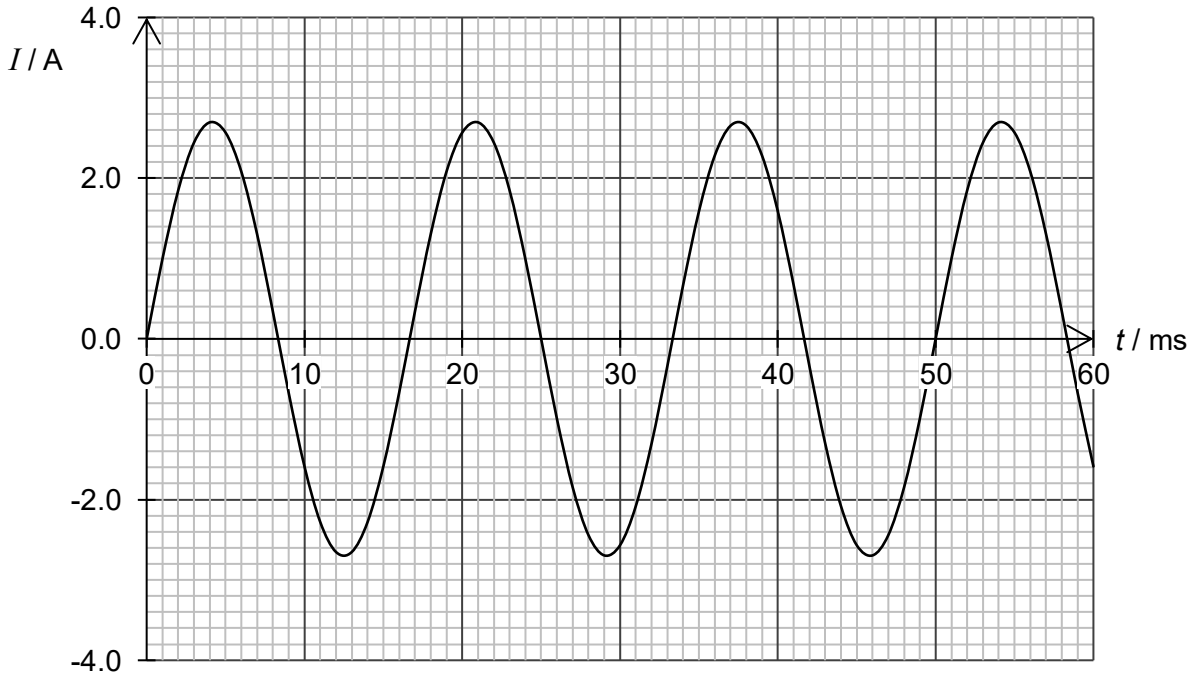

Fig. 5.2

(a) Determine the mean power dissipated across the resistor R.

mean power = ... W [2]

(b) Determine the number of turns in the secondary coil N_S.

N_S = ... [2]

(c) Determine the frequency of the alternating voltage supply. Explain your working.

frequency = ... Hz [2]

(d) Explain how your answer in **(a)** will be affected if the frequency of the alternating voltage supply is doubled, while the peak voltage of the supply remains the same.

.....

....

.... [2]