6 A load resistor *R* and a diode are connected to an alternating current (a.c.) source as shown in Fig. 6.1.

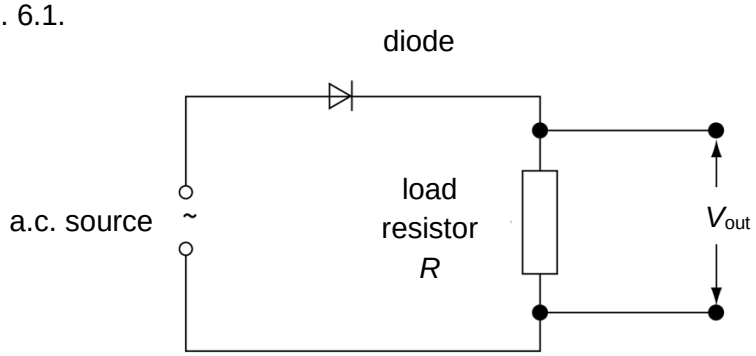

Fig. 6.1

The a.c. source supplies a voltage *V*, where

$$V = V_0 \sin 100\pi t$$

(a) **(i)** Determine the period of variation of *V*.

period = ... s [1]

(ii) On Fig. 6.2, sketch the variation with time of V_{out}. Label the time axis.

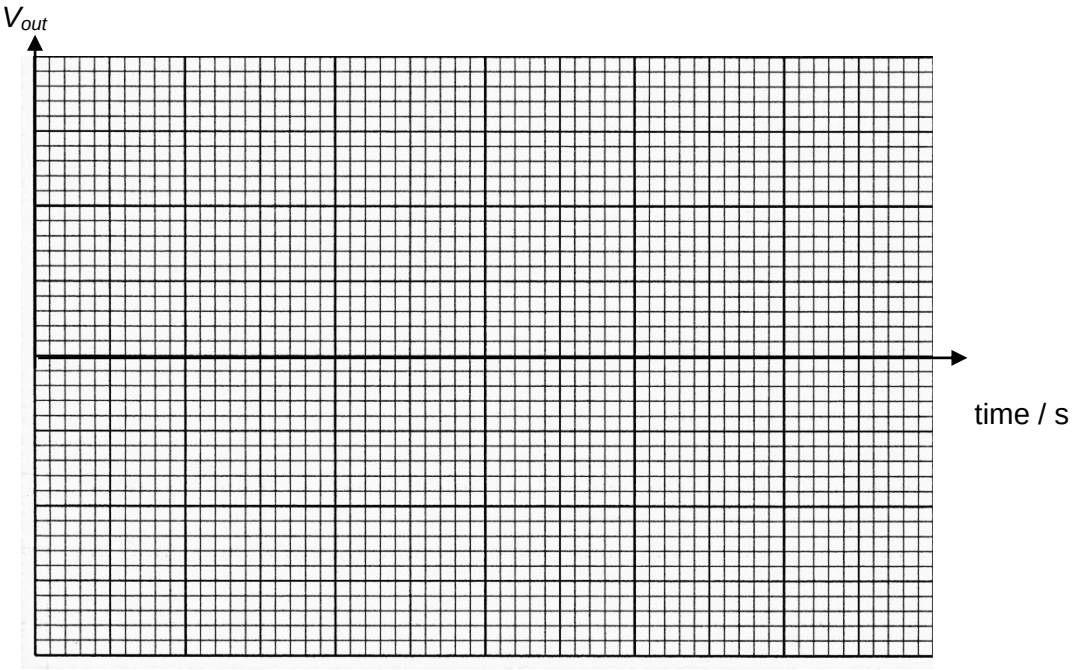

Fig. 6.2

[2]

(b) **(i)** The mean power dissipated in load resistor R is found to be 40 W.

If R = 640 Ω, determine the value of V_0.

V_0 = ... V [3]

(ii) On Fig. 6.3, sketch the variation with time of power dissipated across the load resistor R. Label both axes.

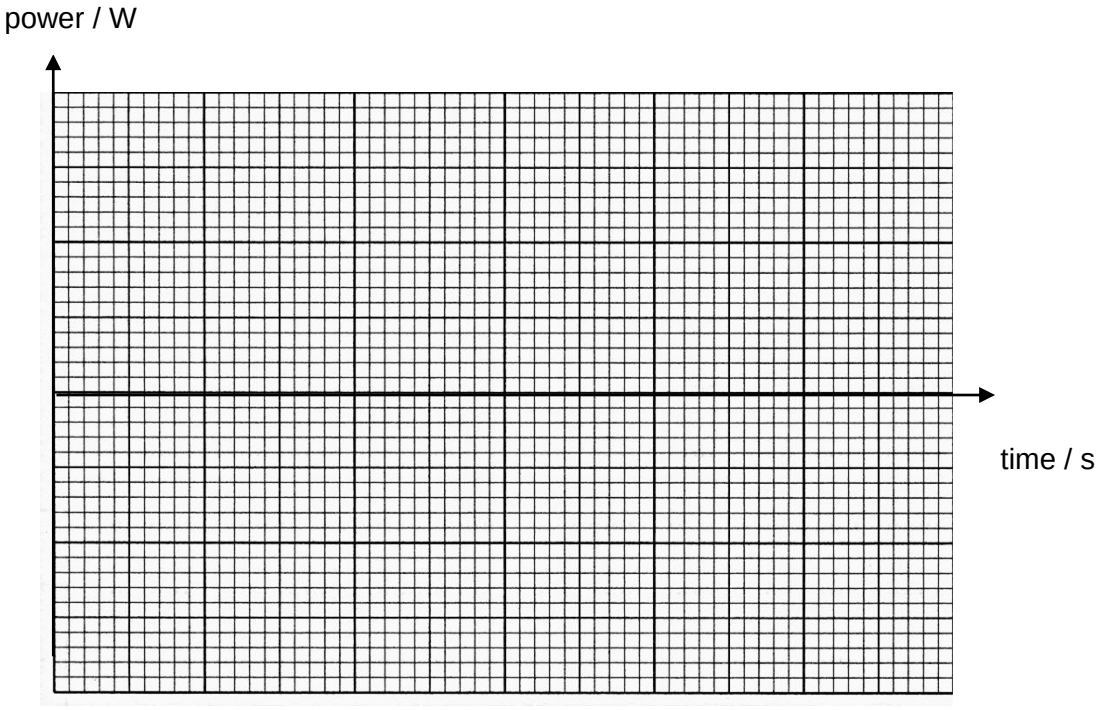

Fig. 6.3

[2]