

8 (a) State what is meant by the frequency of an alternating current.

.....
..... [1]

(b) An alternating current I in a resistor of resistance 680Ω varies with time t according to

$$I = 3.5 \sin(40\pi t)$$

where I is in A and t is in s.

(i) Show that the period of the alternating current is 50 ms.

[1]

(ii) On Fig. 8.1, sketch the variation of I with t between $t = 0$ and $t = 100$ ms.

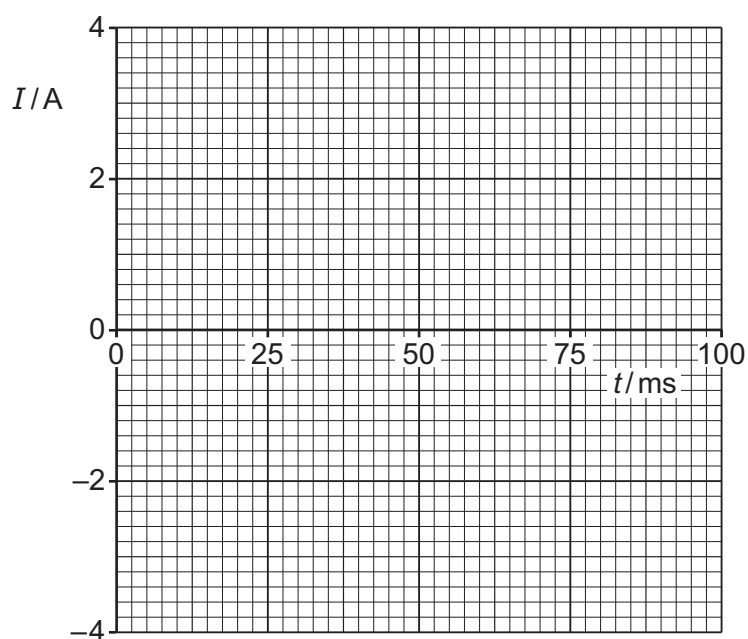


Fig. 8.1

[3]





(iii) Determine the root-mean-square (r.m.s.) current in the resistor.

r.m.s. current =A [1]

(c) Use data from (b), including your answer in (b)(iii), to show by calculation that the mean power in the $680\ \Omega$ resistor is half of the peak power.