

- 7 An alternating voltage V varies with time t according to

$$V = 18 \cos 40\pi t$$

where V is in V and t is in s.

- (a) For the alternating voltage:

- (i) show that the period is 0.050 s

[1]

- (ii) determine the root-mean-square (r.m.s.) voltage.

r.m.s. voltage = V [1]

- (b) On Fig. 7.1, sketch the variation of V with t for values of t from $t = 0$ to $t = 100$ ms.

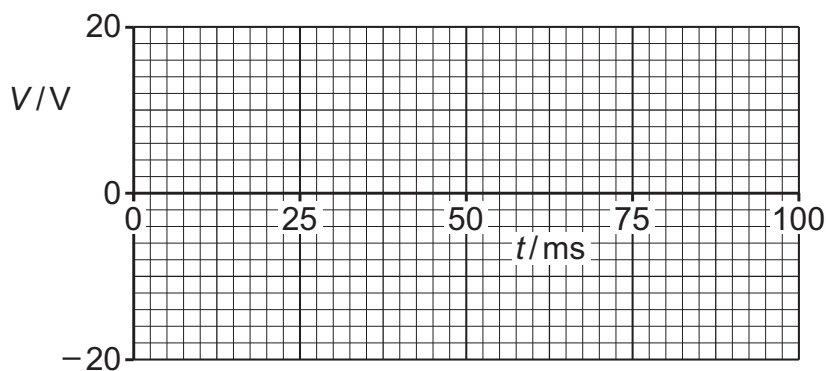


Fig. 7.1

[3]

- (c) The alternating voltage is rectified to produce an output voltage across a load resistor R , as shown in Fig. 7.2.

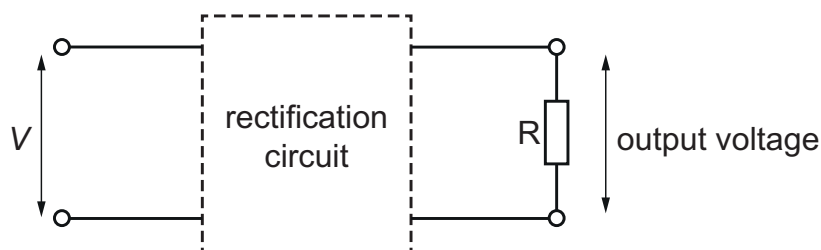


Fig. 7.2

Fig. 7.3 shows the variation with t of the power P in the load resistor.

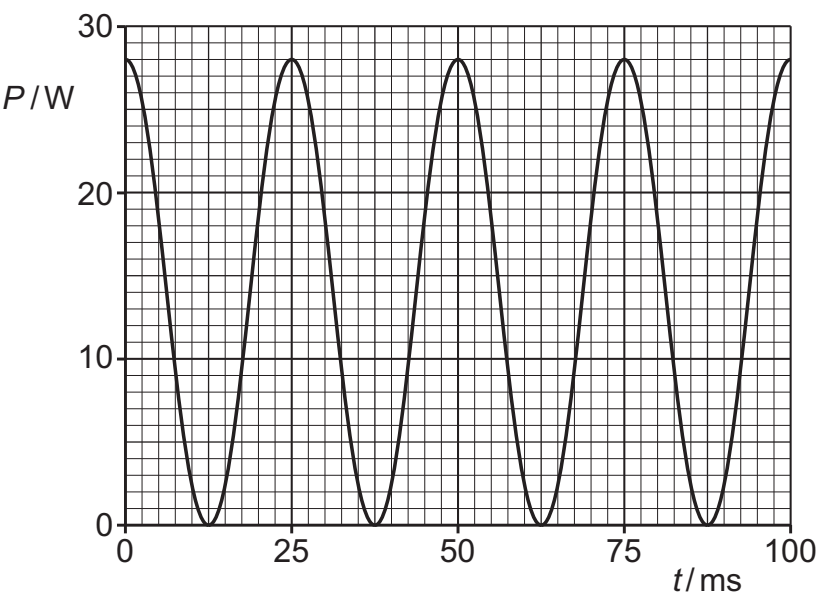


Fig. 7.3

State **three** conclusions that can be drawn from Fig. 7.3. The conclusions may be qualitative or quantitative. Use the space for any working.

- 1
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- 2
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- 3
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[3]

[Total: 8]