

- 4 The variation with time t of the output potential difference (p.d.) V of a sinusoidal a.c. power supply is shown in Fig. 4.1.

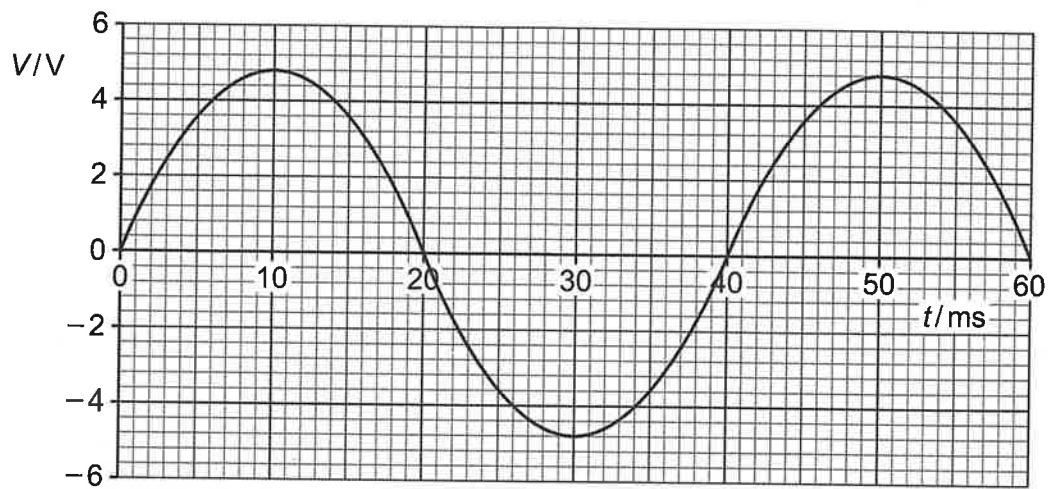


Fig. 4.1

- (a) Determine an equation for V in terms of t , including numerical values, where V is in V and t is in s.

[2]

- (b) The power supply is connected to a circuit that includes three resistors, as shown in Fig. 4.2.

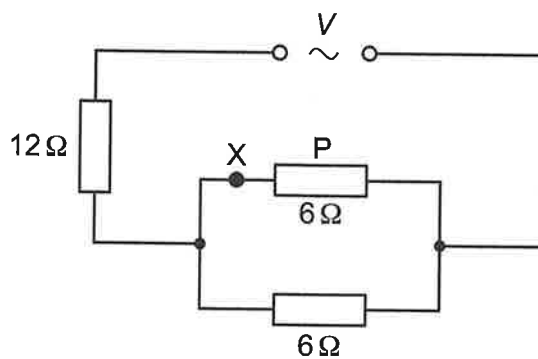


Fig. 4.2



- (i) Show that the total resistance of the circuit is $15\ \Omega$.

[1]

- (ii) Determine the mean power dissipated in the circuit.

mean power = W [2]

- (iii) An ideal diode that has no resistance when conducting is connected in series with resistor P at point X.

On Fig. 4.3, sketch a line to show the variation with t of the p.d. across resistor P for a time of 40 ms. Add a scale to the y-axis.

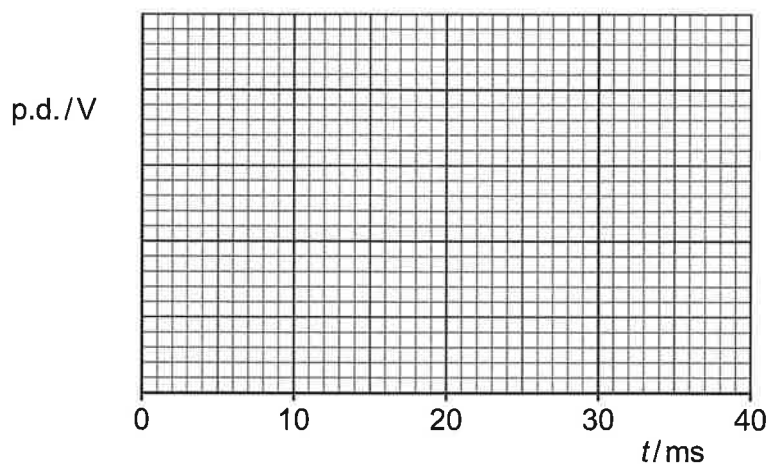


Fig. 4.3

[2]

[Total: 7]

