

- 8 (a) State what is meant by root mean square voltage.

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

- (b) An alternating voltage of period 10 ms is being applied directly across a resistor of 25.0Ω in a circuit. The variation with time t of voltage V is shown in Fig. 8.1.

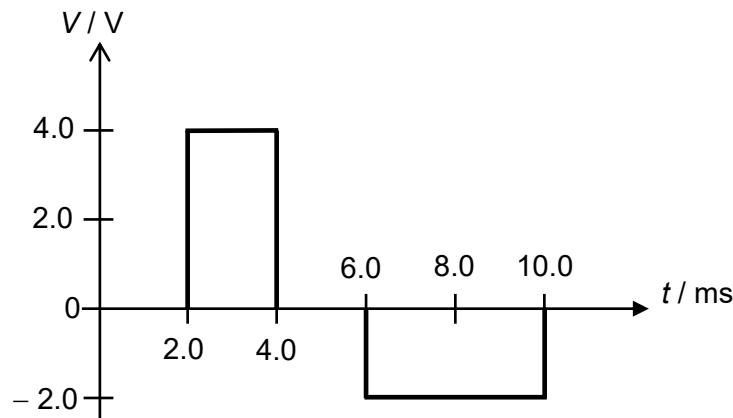


Fig. 8.1

Calculate the average power dissipated in the resistor.

$$\text{average power} = \dots \text{W} \quad [3]$$

- (c) Explain why it is necessary to use high voltages for the efficient transmission of electrical energy.

[2]

- (d) A 50 Hz sinusoidal voltage input of 15 V is connected to the primary coil of an ideal transformer as shown in Fig. 8.2. The turns ratio of the transformer, $\frac{N_s}{N_p}$ is 70. The secondary coil is connected to a 2500Ω resistor.

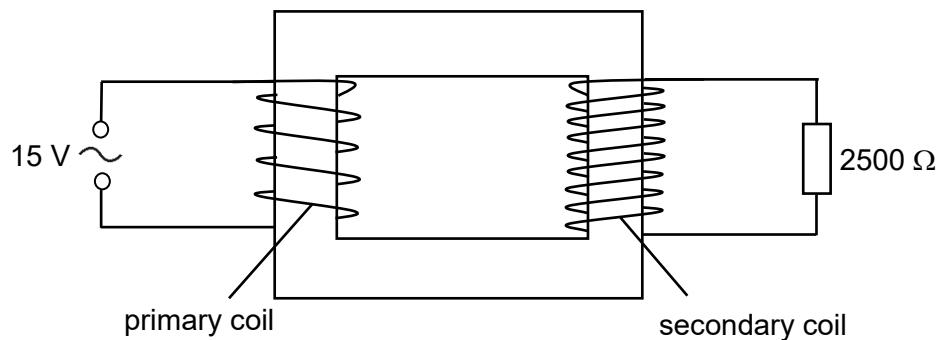


Fig. 8.2

- (i) Calculate the r.m.s output voltage supplied to the 2500Ω resistor.

$$\text{r.m.s output voltage} = \dots \text{V} \quad [1]$$

- (ii) In Fig. 8.3, sketch the variation with time t of the power P dissipated in the 2500Ω resistor. Label all values on the axes.

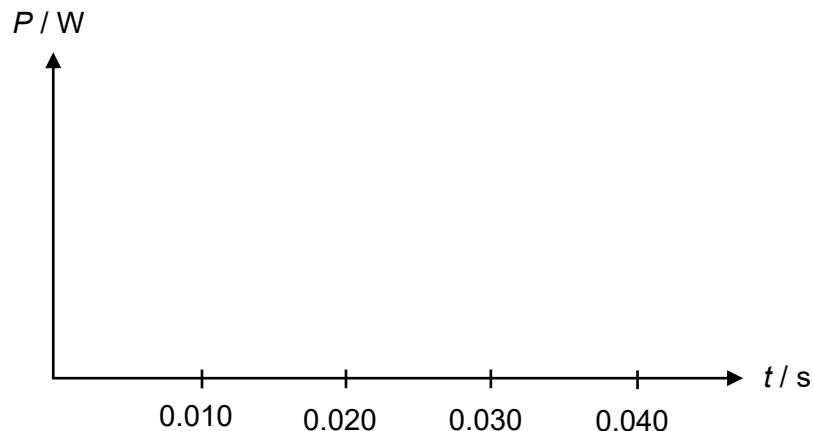


Fig. 8.3

[2]

[Total: 9]

Section B

Answer **one** question from this Section in the spaces provided.