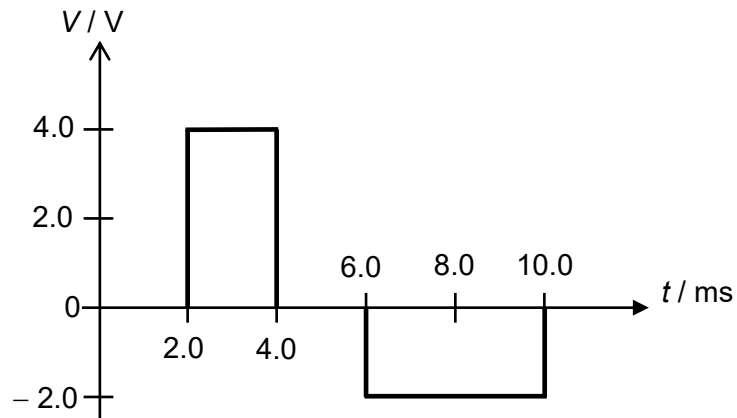


- 8 (a) State what is meant by root mean square voltage.

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

- (b) An alternating voltage of period 10 ms is being applied directly across a resistor of  $25.0\ \Omega$  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.

average power = ..... W [3]

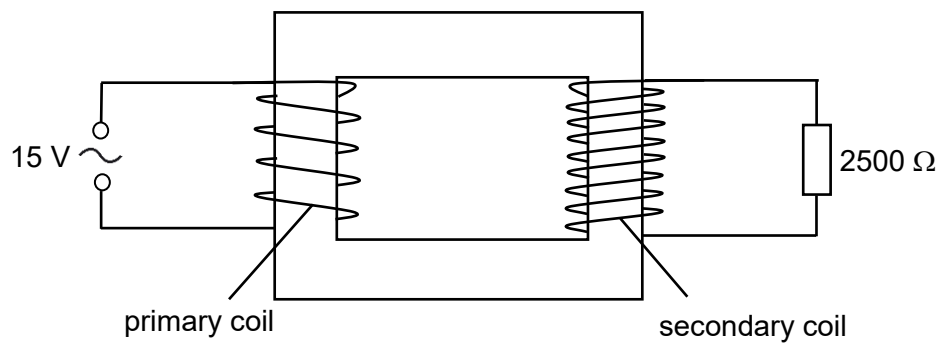
- (c) Explain why it is necessary to use high voltages for the efficient transmission of electrical energy.

.....

.....

..... [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 2500  $\Omega$  resistor.

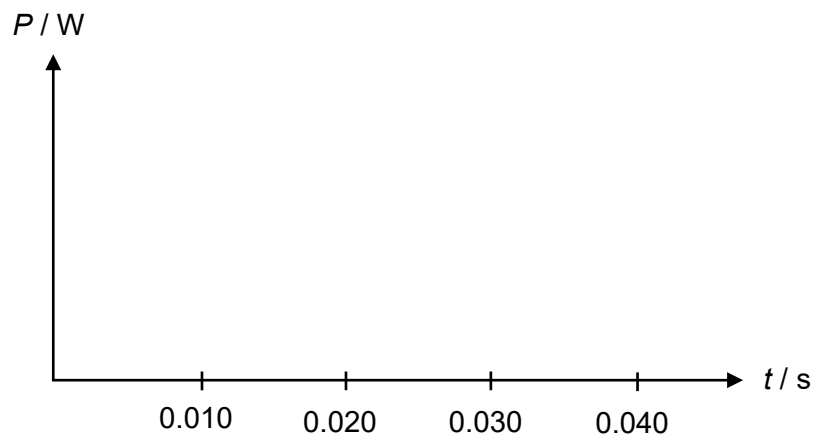


**Fig. 8.2**

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

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

- (ii) In Fig. 8.3, sketch the variation with time  $t$  of the power  $P$  dissipated in the 2500  $\Omega$  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.