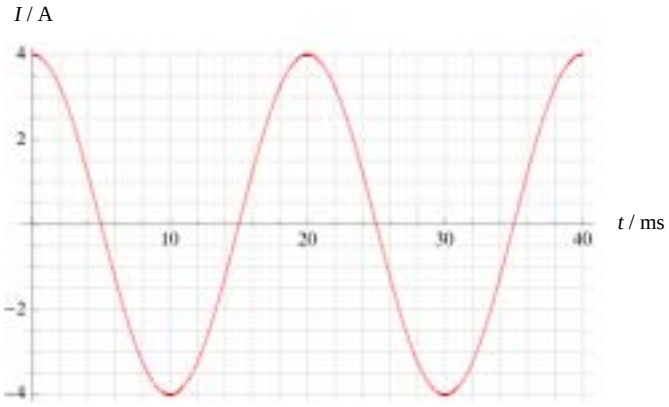
Extension Worksheet – Topic 5, Worksheet 8

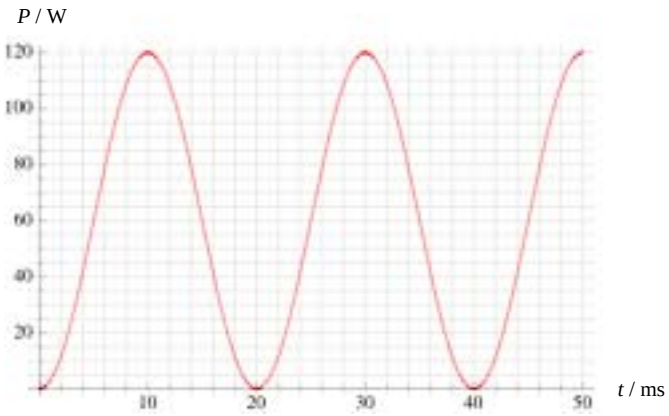
1 The current in the primary coil of a transformer varies with time as shown in the graph.



The number of turns in the primary coil is 2000 and that in the secondary is 400. Determine the maximum current in the secondary coil assuming the transformer is 60% efficient. [2]

2 Two equal resistors of constant resistance R are connected in parallel to a source of AC voltage of peak value V_0. Calculate the average power dissipated in the circuit. [2]

3 The power (in W) generated by a generator varies with time (in ms) according to the following graph.



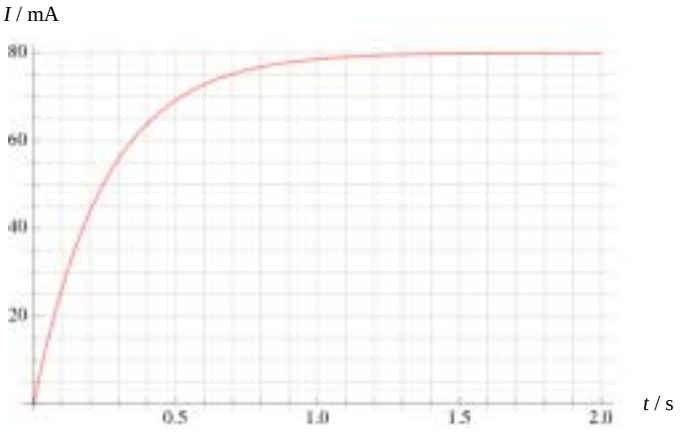
Determine

a the average power generated. [1]

b the rotation frequency of the generator. [2]

4 The generator of the question **3** has its frequency reduced to half the value. On the axes above sketch a graph to show the variation with time of the power of the generator. [2]

5 A battery is connected in series to a switch and a coil. The graph shows the variation of the current in the coil after the switch is closed.



Explain, by reference to the laws of electromagnetism, why the current takes some time to reach its steady constant value. [3]

6 In a power station the produced voltage has a peak value of 2.0 kV. The voltage is stepped up to 120 kV before transmitting the power to consumers. State and explain the effect of this on the amount of power that is saved from being wasted as heat in the transmitting cables. [2]