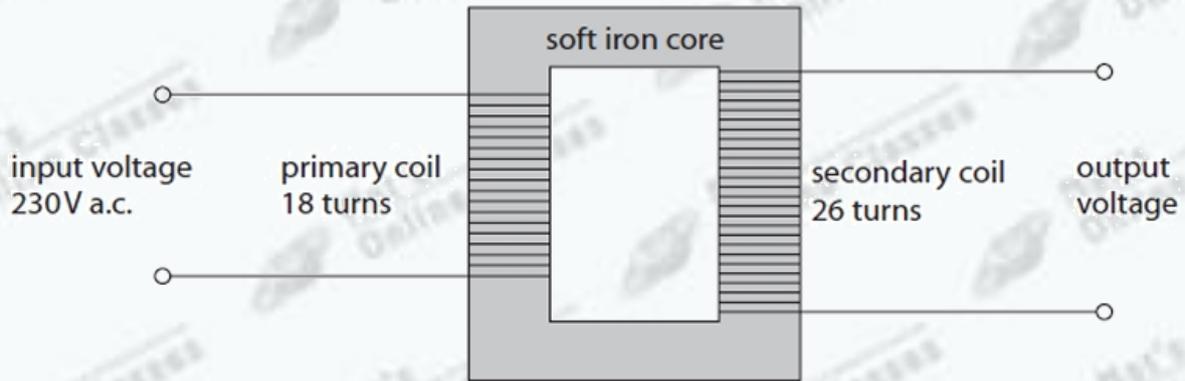


# Electromagnetic Induction and Transformers

Total marks:18

Q1.

Figure 18 shows a transformer.



**Figure 18**

(i) State the purpose of the transformer shown in Figure 18.

(1)

(ii) Calculate the output voltage of the secondary coil.

Use an equation selected from the list of equations at the end of this paper.

(3)

output voltage = ..... V

**(Total for question = 4 marks)**

**Q2.**

This question is about using the mains electricity supply.

A transformer is used to connect a laptop computer to the mains electricity supply.

The input voltage to the transformer is 230 V.

The output current from the transformer is 2.37 A.

The transformer has an output voltage of 19.0 V.

The transformer used is 100% efficient.

Calculate the input current to the transformer.

Use the equation

$$\text{input current} \times \text{input voltage} = \text{output current} \times \text{output voltage}$$

(3)

$$\text{input current} = \dots\dots\dots \text{ A}$$

**(Total for question = 3 marks)**

**Q3.**

The primary coil of a different transformer is connected to the 230 V mains supply.

The voltage across the secondary coil is 15 V.

The primary coil has 600 turns.

Calculate the number of turns on the secondary coil.

Use an equation selected from the list of equations at the end of the paper.

(2)

$$\text{number of turns} = \dots\dots\dots$$

**(Total for question = 2 marks)**

Q4.

\* Figure 19 shows a coil of wire that is being rotated between the poles of a magnet.

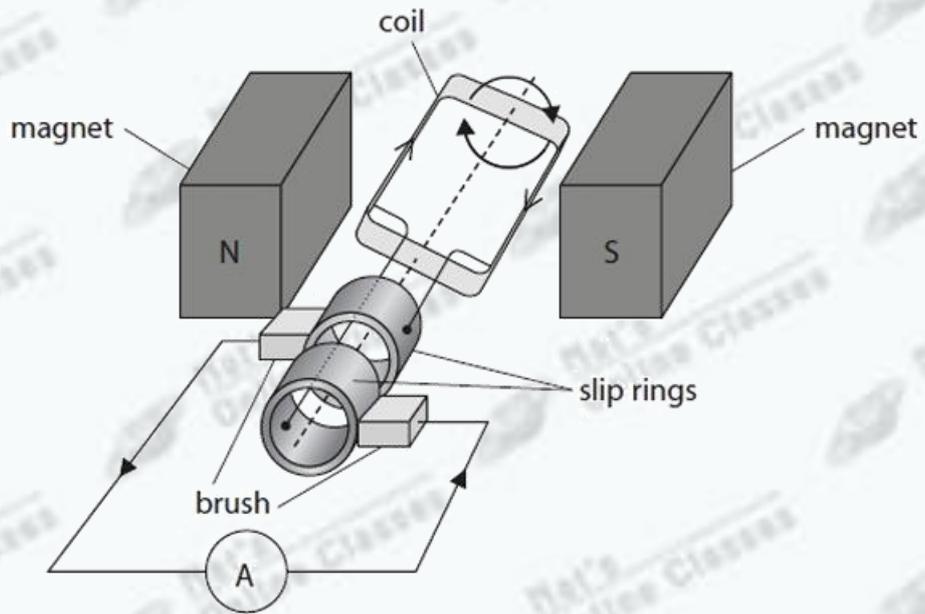


Figure 19

Figure 20 shows how the current in the coil changes during **one** complete rotation of the coil.

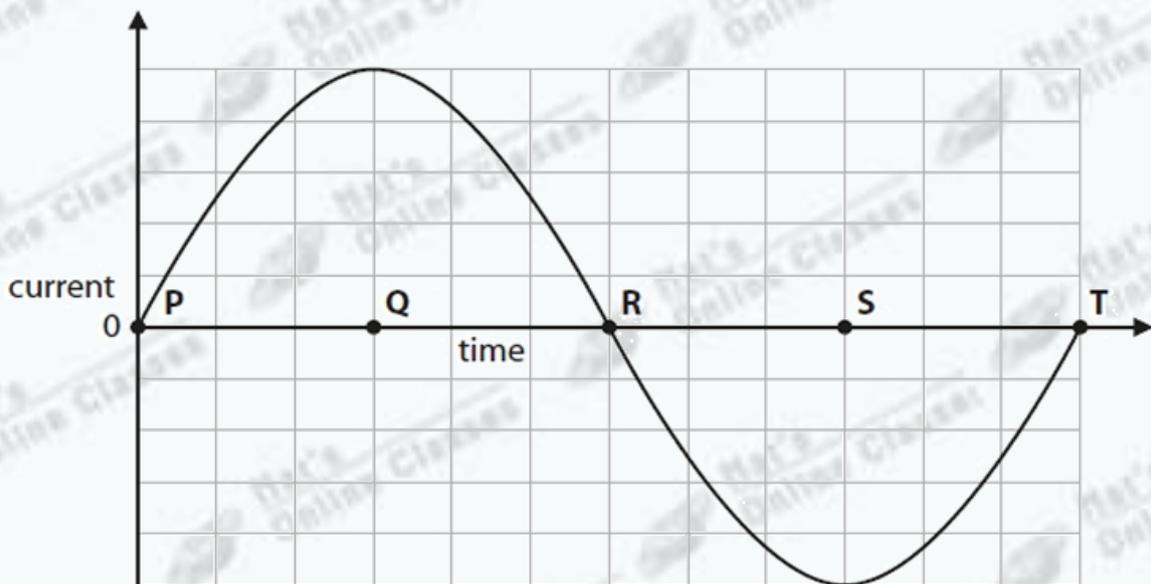


Figure 20



Q5.

Complete the following sentences using one of the phrases from the box below.

efficiency is reduced  
the national grid  
a power station  
heat loss is reduced  
a transformer

(i) Electrical power is generated at

(1)

.....

(ii) Electricity is transmitted over long distances by transmission lines that are part of

(1)

.....

(iii) Electricity is transmitted at high voltages so that

(1)

.....

**(Total for question = 3 marks)**