

Q1.

Which statement is true for transformers?

(1)

- ☐ **A** Transformers can only step-up voltages.
- ☐ **B** Transformers can only step-down voltages.
- ☐ **C** Transformers can work with direct current.
- ☐ **D** Transformers have primary and secondary coils.

(Total for question = 1 mark)

Q2.

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)

Q3.

Explain why step-up transformers are used in the transmission of electricity in the National Grid.

(2)

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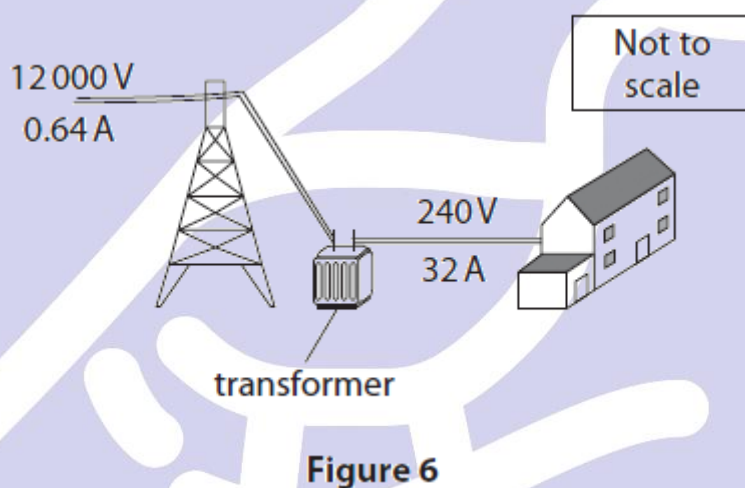
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(Total for Question = 2 marks)

Q4.

Figure 6 shows part of the UK National Grid system for the supply of electricity to homes.



Explain why the National Grid uses high voltages with small currents to transfer electricity from power stations.

(2)

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(Total for question = 2 marks)

Q5.

The photograph shows a step-down transformer.



- (a) Explain why step-down transformers are used in the transmission of electricity in the National Grid.

(2)

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.....

(Total for Question = 2 marks)

Q6.

* The first public power station was built in the centre of New York.

It used generators to supply direct current at 110 V. The cables had to go underground and they could only supply nearby shops and offices.

The electricity was mainly used for electric light.

The development of alternating current generators led to major changes in the way electricity is transmitted and used.

Compare the modern National Grid system with the early system in New York.

(6)

(Total for question = 6 marks)

Separate Physics Only

Q7.

Figure 22 shows how electricity is delivered efficiently from a power station (P) to homes (T).

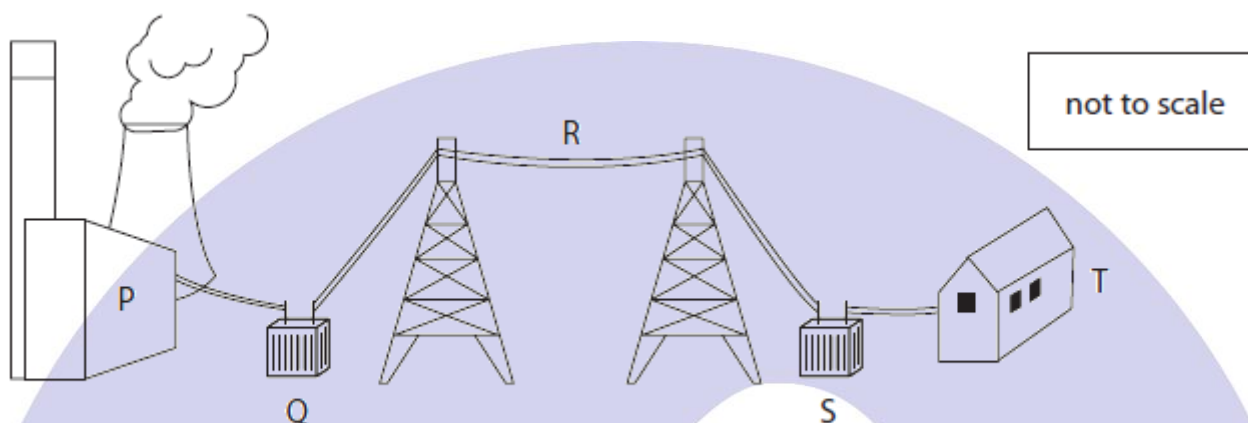


Figure 22

Using Figure 22, explain the stages in the process of delivering electricity efficiently from P to T.

Your answer should include details of the effects that Q, R and S have on efficiency.

(6)

(Total for question = 6 marks)

Q8.

* High voltage transmission cables and transformers are used in the national grid.

Explain how using high voltage transmission cables and transformers allows the distribution of electrical power around the United Kingdom to be as efficient as possible.

Refer to the following equations in your answer.

$$P = I^2 \times R$$

$$V_p \times I_p = V_s \times I_s$$

(6)

(Total for question = 6 marks)