Worksheet: Electricity Transmission Networks

Question Video

Q1: What type of device can be used to increase the potential difference of electricity supplied to the national grid so as to increase the power transmitted while reducing energy lost to the surrounding environment?

A A solenoid

B A diode

C A transformer

D A rectification circuit

E A capacitor

Q2: The national grid transmits electrical power at a very high potential difference and a very low current. Why is this?

A This occurs because potential difference can be decreased easily but not increased easily.

B This occurs because if the current is high, the cables carrying the current heat up, and a lot of power is lost to the surrounding environment. Less energy is wasted by increasing the potential difference and decreasing the current.

C This occurs because most appliances in homes require a very high potential difference and a very low current.

D This occurs because most power stations generate electricity at a very high potential difference, and it is easier to transmit the power with the same potential difference and current that it is generated with.

Q3: A nuclear power station in the UK develops a fault and needs to be shut down quickly so that it can be repaired. Which of the following types of power station could be quickly turned on to compensate for the supply lost by the nuclear power station shutting down?

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A A tidal barrage

B A solar farm

C A gas-fired power station

D A wind farm

E Another nuclear power station

Q4: Fossil fuel power stations often only produce about 33% of the total electricity they could produce when operating at maximum output. Which two of the following reasons explain why is this?

a. Because fossil fuel power stations are more efficient when running at far less than their maximum output

b. So that the national grid can cope with unexpected higher demand

c. Because we never need more electricity than this

d. In case there is an unexpected shutdown of another power station

A b and d

B c and b

C d and c

D a and c

E a and b

Q5: Electricity demand increases over winter. Which of the following reasons best explains why this is?

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A People stay indoors more in winter and therefore spend more time doing activities that involve electrical appliances, such as watching television.

B Many electrical appliances are less efficient in colder temperatures. Thus, a greater electricity supply is needed for the same appliances to work as well.

C Electricity is cheaper in winter, so people switch from heating their homes with gas or oil to heating their homes using electric heaters.

D During winter, the weather is colder and it gets darker earlier in the evening. Demand for electricity increases because electrical appliances are being used to heat and light homes for a while longer each day.