

3: Energy – Topic questions

Paper 3

The questions in this document have been compiled from a number of past papers, as indicated in the table below.

Use these questions to formatively assess your learners' understanding of this topic.

Question	Year	Series	Paper number
3	2016	June	31
5	2016	March	32
7	2016	March	32

The mark scheme for each question is provided at the end of the document.

You can find the complete question papers and the complete mark schemes (with additional notes where available) on the School Support Hub at www.cambridgeinternational.org/support

- 3 Fig. 3.1 shows a metal plate-warmer.

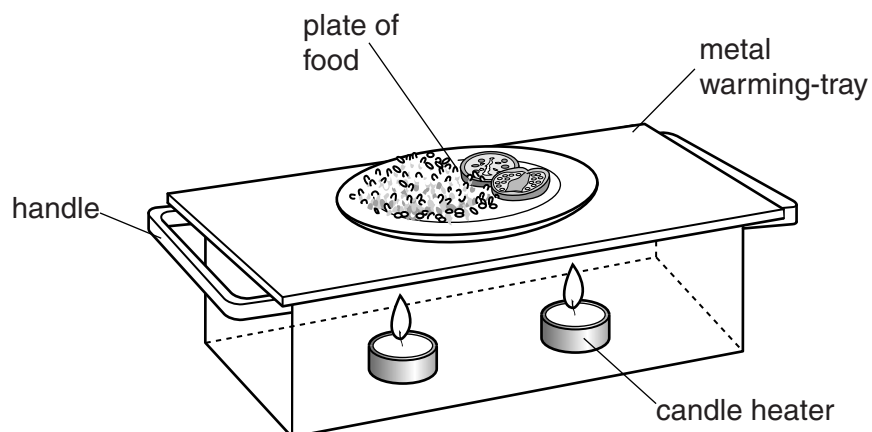


Fig. 3.1

The plate-warmer contains two small candle heaters. Plates of food are placed on top of the warming-tray.

- (a) (i) State the name of a process by which the thermal energy from the candles passes to the warming-tray.

.....[1]

- (ii) State the name of the process by which thermal energy moves through the warming-tray.

.....[1]

- (b) The outside of the plate-warmer is shiny.

Suggest how this helps the plate-warmer to stay hot.

.....[1]

- (c) The handles of the plate-warmer are made from metal.

Identify a problem with this, and suggest how the problem could be solved.

problem:

action:

[2]

[Total: 5]

5 Fig. 5.1 shows a wave-powered generator. It generates electricity from the movement of sea waves.

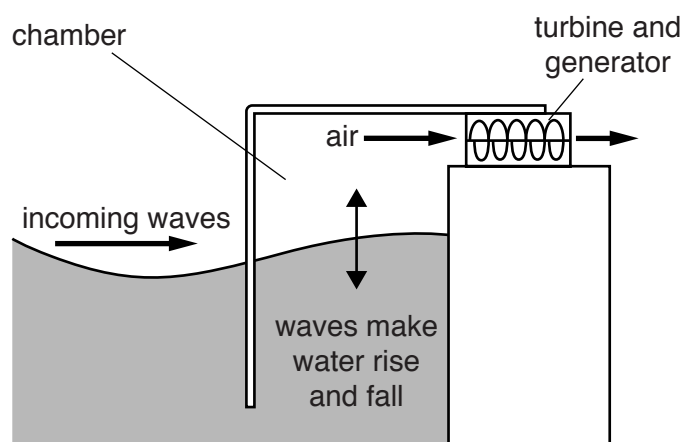
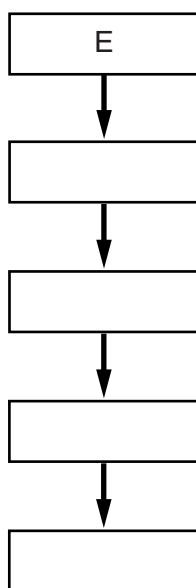


Fig. 5.1

(a) The sentences below describe how the wave-powered generator works.

- A Air is pushed through the turbine, making it spin.
- B Water rises and falls in the chamber.
- C The turbine turns a generator.
- D The generator produces electrical energy.
- E Waves travel towards the chamber.

Write letters in the boxes below to arrange the sentences in the correct order. The first one is done for you.



[3]

- (b) More electricity needs to be generated from renewable sources instead of from burning fossil fuels.

State **three** benefits of generating electricity from renewable sources rather than from fossil fuels.

.....

.....

.....

.....

.....[3]

[Total: 6]

7 Fig. 7.1 shows a room with a heater.

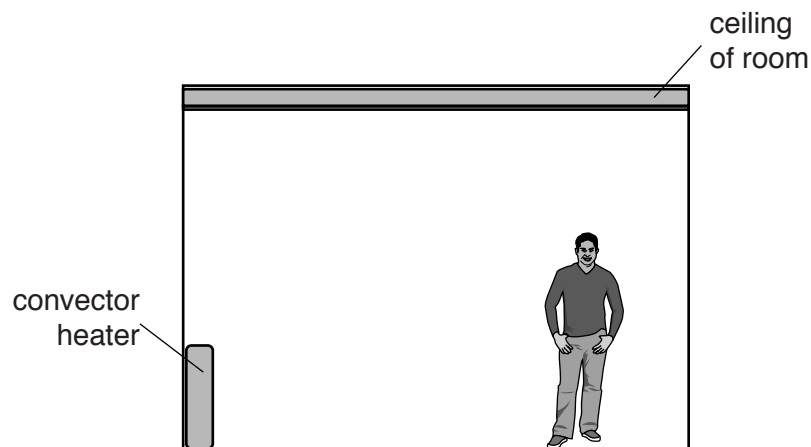


Fig. 7.1

(a) The temperature in the room is hottest near to the ceiling. Explain why.

.....
.....[2]

(b) The ceiling of the room is made from an insulating material as shown in Fig. 7.2.

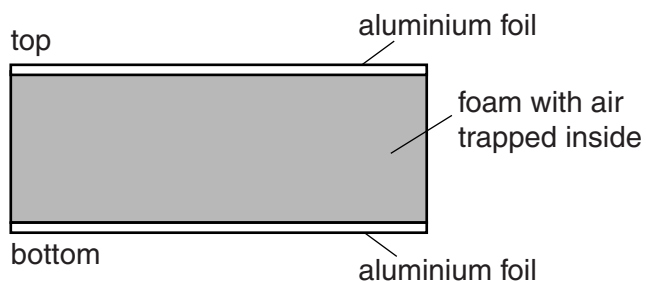


Fig. 7.2

Explain how this reduces the transfer of thermal energy through the ceiling.

.....
.....
.....
.....
.....
.....[4]

[Total: 6]

Question	Answer	Mark
3 (a) (i)	convection OR radiation	B1
3 (a) (ii)	conduction	B1
3 (b)	poor emitter OR poor radiator (of thermal energy)	B1
3 (c)	(handles) become hot use an insulator	B1 B1
		Total: 5
5 (a)	correct order: E B A C D 1 mark for B immediately before A 1 mark for C immediately before D 3 marks for all correct i.e. B, A, C then D	B3
5 (b)	any three from: <ul style="list-style-type: none"> • conserve non-renewable reserves • less atmospheric pollution / acid rain • reduces greenhouse gases / global warming • (renewable) energy source will not run out • reduces dependence on fossil fuels (from other countries) 	B3
		Total: 6
7 (a)	any two from: <ul style="list-style-type: none"> • hot air expands / particles move (further) apart • hot air less dense • less dense air rises 	B2
7 (b)	any four from: <ul style="list-style-type: none"> • aluminium / foil (on bottom) is a good reflector • infrared / radiation reflected back into room • (trapped) air is a good insulator / poor conductor • (insulation) reduces heat lost by conduction • foam reduces convection currents / prevents air moving • (air cannot move so) prevents heat loss by convection • aluminium / foil (on top) is a poor emitter (so reduces radiation into space above ceiling) 	B4
		Total: 8

Notes about the mark scheme are available separately.